HALIFAX
REGIONAL MUNICIPALITY

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Environment and Sustainability Committee
April 7, 2011

TO: Chair and Members of Environment and Sustainability Committee

SUBMITTED BY: Phillip Townsend, Director, Infrastructure and Asset Management

DATE: March 10, 2011

SUBJECT: **Administrative Order 23: Inclusion of FeHEDTA**

ORIGIN

This report originates from industry's request to examine the inclusion of FeHEDTA to the permitted pesticides list, following the release of the Provincial Non-Essential Pesticides Regulations; and

- Regional Council, Information Item 3, January 11, 2011: Provincial Pesticide Regulations
- Environment and Sustainability Committee, Information Item, February 3, 2011: Legislated Scope of Pesticide By-Law P-800
- Environment and Sustainability Committee, Briefing Note, March 3, 2011: Administrative Order 23

RECOMMENDATION

It is recommended that the Environment and Sustainability Committee:

1. Endorse FeHEDTA being included in Administrative Order 23 (Permitted Pesticides List);
2. Request staff to provide a follow up report on the practicality, costs and benefits of aligning Administrative Order 23 with the Provincial Allowable List; and
3. Endorse Policy that Halifax Regional Municipality (HRM) Operations will not use FeHEDTA in municipal turf care operations.

Executive Summary

This report deals with a request to add Chelated Iron or FeHEDTA, a new product invented by Eco Care Technologies (as per attachment 14) that is effective for spot treatment of broad leaf weeds, to HRM's Administrative Order 23 (Permitted Pesticide List). A primary factor that underlays this request is the 2010 Provincial Pesticide Regulations, which starts phasing in during 2011. One product that is Allowable under the Provincial Regulations, but not Permitted under the HRM policy, is FeHEDTA.

Staff received substantial public and industry input which resulted in this recommendation. Summarily, opponents of FeHEDTA put forth concerns of: Drift, Soil Persistence, Toxicity, Groundwater/Drinking Water Risks, Handling Risks, Iron Overload (to humans) and Risk to Waterways and Aquatic Life. Proponents countered with profound information which reasonably answered all of these concerns.

Staff considered the historical practice of using OMRI (Organic Materials Review Institute) as a guideline for the consideration of materials to Administrative Order 23 and determined that as industry has responded to the market desire for an environmentally low toxicity alternative, it is incumbent upon the municipality to review this practice reasonably.

The original intent of the Pesticide By-Law, originating in 2000, was protection of Human Health. In consideration of this recommendation, staff recognized that there are external items (biodiversity, ecological impacts, and cost) that lead staff to recommend against use within municipal operations, but are not within the parameters of the By-Law.

Reviewing all the information presented, comparing the product to other lawn care products (such as fertilizer) and products permitted by HRM, there is not a sufficient reasonable risk to Human Health to give staff concern that restriction of the use of FeHEDTA is a reasonable action.

Maintaining the integrity of the by-law is important to the community and staff. There remain benefits of the HRM policy that Provincial regulations do not afford. In order to maintain community confidence in the integrity of the By-Law, it is important that deliberation around the consideration of a low toxic lawn care product is reasonable.

BACKGROUND

Starting in the late 1990's, Halifax Regional Council took the environmentally progressive approach to restricting the use of pesticides for the purposes of turf care in the municipality. As per the original presentation (http://www.halifax.ca/pesticides/present1/sld001.htm) from March 2000, the focus of the policy and legislation is on the protection of human health, particularly those at highest risk.

Original Motion: *It is recommended that a Pesticide By-Law be drafted, which provides protection for people diagnosed as having potentially life-threatening reactions to pesticide exposure by providing a ban on pesticide use within 100 metres of residences of such registered people.*

A phased in by-law (P800 Respecting the Regulation of Pesticides, Herbicides and Insecticides) was adopted in August 2000. Outside of the By-Law, HRM maintains Administrative Order 23, which is the list of permitted pesticides in the municipality (for lawn care activities).

Since this environmentally leading action was taken by the community and Regional Council in the early 2000's, other municipalities and jurisdictions have followed. The Province of Ontario created a restricted list in the early 2000's and the Province of Nova Scotia enacted its' own legislation in 2010. The provincial legislation does not usurp the municipal authority with respect to pesticides. Generally, the legislation is highly complimentary. However, one product of difference between the HRM permitted list and the Provincial allowable list is FeHEDTA (Chelated Iron).

Since the early 2000's, staff and council have used the following protocol to review submissions for adding items to the permitted list.

HRM Procedures to Amend Permitted List:
According to the Procedures to Amend the Permitted Pesticides List in Administrative Order #23, substances must satisfy the following requirements:

1. Full disclosure of all ingredients of any material/substance being considered;
2. The material/substance must not be prohibited by OMRI (Organic Material Review Institute) in their generic names list;
3. The material/substance must not be prohibited from use in Canada;
4. Proposed substances/materials not presently listed on OMRI's generic names list shall be referred to OMRI for review and recommendation at the cost of the applicant;
5. Whereas advance notice to the public on Administrative Order #23 is required through brochures, newsletters, etc., it is recommended that unless there are exceptional circumstances, an annual process be completed by February 15th of each year to amend the list of Permitted Pesticides; and
6. These procedures shall be reviewed periodically by the appropriate staff to help ensure they remain up to date and effective.

In early 2011, staff received requests from industry to put FeHEDTA on the permitted list (see Attachment One: Landscape Nova Scotia; Attachment Two: Scotts Canada; and Attachment Three: Neudorff).

As per Attachment Four (Health Canada Registration Decision): What is FeHEDTA?
Iron is a metallic chemical element (symbol "Fe") that acts as a selective herbicide when chelated with hydroxyethylenediaminetriacetic acid (HEDTA) to form FeHEDTA. Broadleaved plants are generally more susceptible to the herbicidal effects of FeHEDTA than are grass species. The mechanism of selectivity is not entirely understood but is believed to relate in part to differences in uptake. As Fe can function as a catalyst for oxygen reduction, thereby producing unstable and highly reactive oxygen species, including hydroxyl radicals that cause cellular damage, the excessive uptake of FeHEDTA by many broadleaved species, leads to tissue necrosis and ultimately plant death.

June 8, 2010, Regional Council, Staff Recommendation Regarding FeHEDTA:
In June 2010, Staff presented a recommendation to Regional Council (Attachment Five) that, based on then current direction of Council (to recommend to the Province of Nova Scotia to adopt pesticide regulations equivalent to Ontario), to include FeHEDTA on the Permitted List as it was included on the Ontario Class 11 list of low toxic pesticides. The primary impetus for rejection of the product was the general debate on pesticides and the imminent provincial regulations. Council deliberation did not wade into the merits of the product. This report provides greater information both for the contrary and the recommending sides.

DISCUSSION

Council Policy and past direction on this matter is clear. FeHEDTA based products, WeedBgon and Fiesta, do not comply with the HRM Procedures to Amend Permitted List. This is the Policy staff has to work with and according to this policy, the requested product cannot be considered. Should the committee wish to consider FeHEDTA, a change in policy is required.

That being said, the reasonable action may be to change policy around the permitted list.

Staff has concerns that based on the materials received, rejection of FeHEDTA may jeopardize the support for the HRM Pesticide By-Law. The fundamental intent of the By-Law is protection of Human Health. Staff's review of the materials surrounding this request, clearly demonstrated that the risk to human health does not meet the risk levels which the By-Law is intended to address.

In order to frame the discussion, staff provides the following information on:

- OMRI (Organic Materials Review Institute)
- Submissions Supporting FeHEDTA
- Submissions advocating against FeHEDTA
- Comparison to other products on the HRM list
- Background of the invented product
- Rationale around Municipal Operational restriction

Organics Material Review Institute:
There is some confusion around what OMRI offers HRM.

"Founded in 1997, the Organic Materials Review Institute (OMRI) provides organic certifiers, growers, manufacturers and suppliers, an independent review of products intended for use in certified organic production, handling and processing. OMRI is a 501(c)3 nonprofit organization. When companies apply, OMRI reviews their products against the National Organic Standards. Acceptable products are OMRI Listed and appear on the *OMRI Products List*. OMRI also provides subscribers and certifiers guidance on the acceptability of various material inputs in general, under the National Organic Program." This is important because the purpose of OMRI is to enable growers to certify "Organic" (i.e. Organic fruit and vegetables). Their growers need to be certified and this listing gives them the products they are able to use within their operations and what restrictions apply.

Lawn Care is not a usage that there is an organic certification. While there is a high degree of crossover, products specifically intended for Lawn Care do not apply to the OMRI protocols. OMRI reviews products strictly against the National Organic Program Rule. The following is the list of Product Use Classes:

- Crop Fertilizer or Soil Amendment (CF)
- Crop Pest, Weed, or Disease Control (CP)
- Crop Management Tool or Production Aid (CT)
- Livestock Feed Ingredient (LF)
- Livestock Health Care (LH)
- Livestock External Parasiticide or Pesticide (LP)
- Livestock Management Tool or Production Aid (LT)
- Processing Agricultural Ingredient or Processing Aid (PA)
- Processing Non-agricultural Ingredient or Processing Aid (PN)
- Processing Pest Control (PP)
- Processing Sanitizer or Cleaner (PS)
- Processing Container and Packaging Material (PC)

Lawn care is not a Use Class.

Conversely, to a recent submission from a local academic, the Listing denotes reviewed products as either: Permitted, Restricted, or Prohibited. Following are the reviews for a collection of items currently on the HRM Permitted List. You will note that many items are permitted with Restrictions. Those restrictions are not a condition of the HRM list.

Pyrethrum	Status: Allowed with Restrictions Description: Pyrethrum is a natural botanical extract. Synthetic pyrethroids are prohibited. See also PLANT PESTICIDES. Piperonyl butoxide may not be used as a synergist. See also PIPERONYL BUTOXIDE. Liquid formulations with prohibited inert ingredients are prohibited.
Acetic Acid	Status: Allowed with Restrictions Description: May be used as a pesticide only if the requirements of 205.206(e) are met.
Corn Gluten Meal	Status: Allowed with Restrictions Class: Crop Pest, Weed, and Disease Control Origin: Nonsynthetic Description: May be used as a pesticide if the requirements of 205.206(e) are met. Must not be derived from genetically modified corn.
Diatomaceous Earth	Status: Allowed with Restrictions Description: For use as a pest lure, repellent, or as part of a trap, or as a disease control. May be used for other pesticidal purposes only if the requirements of 205.206(e) are met.
Ferric Phosphate	Status: Allowed with Restrictions Description: May be used as slug and snail bait if the requirements of 205.206(e) are met. Also known as iron phosphate.
Insecticidal	Status: Allowed with Restrictions

soaps	Description: May be used only as an algicide/demosser, herbicide or insecticide if the requirements of 205.206(e) are met. When used as an herbicide, may only be used for farmstead maintenance (roadways, ditches, right of ways, building perimeters) and ornamental crops, nonfood crop uses only; use on any food crop or fallow fields is prohibited. Soaps classified by EPA as List 4 may be used as inert ingredients or adjuvants in combination with pesticides
Bacillus thuringiensis	Status: Allowed with Restrictions Description: May be used as a pesticide if the requirements of 205.206(e) are met.
Animal repellents	Status: Allowed Description: Acceptable if derived from a nonsynthetic source, such as blood meal, rotten eggs, hair, or predator scents, provided synthetic additives are not used.
borax	Status: Allowed with Restrictions Description: May be used as an insecticide for structural pest control provided there is no direct contact with food or crops being certified. Also considered a 'soluble boron product' that may be used for fertility only with a documented boron deficiency. See also BORON PRODUCTS – SYNTHETIC.
Horticultural oils	Status: Allowed Description: See also OILS – NONSYNTHETIC SOURCES. NOP Rule: 205.105
Bordeaux mixture and other sulphur compounds	Status: Allowed with Restrictions Description: May be used only in pest control as insecticides, including acaricides or mite control and for plant disease control, if the requirements of 205.206(e) are met.
Pheromone traps	Status: Allowed with Restrictions Description: Pheromones are considered pesticides according to the NOP definition of pesticides. May not be combined with synthetic substances except for EPA List 3 inerts used in passive pheromone dispensers and List 4 inerts.

OMRI Direction on the Substances in WeedBgon and Fiesta:
(Materials identified on MSDS Sheet, Attachment Six)

Sodium Nitrate (Chilean Nitrate)	Status: Allowed with Restrictions Class: Crop Fertilizers and Soil Amendments Description: Use is restricted to no more than 20% of the crop's total nitrogen requirement. Derived from mined caliche. See Glossary for definition of "Chilean nitrate."
Iron	Status: Allowed with Restrictions Class: Livestock Feed Ingredients, Livestock Health Care Description: May be supplied by ferric phosphate, ferric pyrophosphate, ferrous lactate, ferrous sulfate, iron carbonate, iron chloride, iron gluconate, iron oxide, iron phosphate, iron pyrophosphate, iron sulfate, or reduced iron. See also MINERALS – FEED & HEALTH CARE. NOP Rule: 205.237(a), 205.237(b)(2) & 205.603(d)(2)

HEDTA and NTA	Status: Prohibited Class: Crop Management Tools and Production Aids Description: Synthetic substances not explicitly listed as allowed chelating agents are prohibited. Prohibited chelating agents include DTPA, EDTA, HEDTA, NTA, glucoheptonic acid and its salts, and synthetic amino acids. See also AMINO ACIDS – SYNTHETIC. NOTE: The Restriction is as a Crop Management Tool. Not as a Lawn Care product or as a Pest Control Product.

Staff further compared FeHEDTA to products we allow on our permitted list. It is clear that FeHEDTA does not pose a threat to human health or the environment at, or greater than, a level provided by the current list of permitted products. Focusing on human health, it is clear to staff that FeHEDTA meets the intent of the By-Law.

Hazardous implications of items on HRM's Permitted List:

Pyrethrin	Product can cause skin and eye irritation. Avoid contact with skin and eyes. Potential skin sensitizer. Keep pets and children out of the treated area until after the spray has dried. Do not apply to blossoms or when temperatures exceed 28° C. This product is toxic to fish. Do not apply where runoff is likely to occur. Do not contaminate streams, lakes or ponds. Do not use on sweetpeas, nasturtiums ordelicate ferns. Spinach and schizanthus may be sensitive to topical foliar spraying. Source: Label
Corn Gluten Meal	CGM should not be applied to areas where it is likely to wash directly into watersheds (it is a nitrogen source). This can contribute to the eurtorphication of lakes. Source: Wikipedia
Boric Acid	Boric acid is a dangerous poison. Poisoning from this chemical can be acute or chronic. Acute boric acid poisoning usually occurs when someone swallows powdered roach-killing products that contain the chemical. Chronic poisoning occurs in those who are repeatedly exposed to boric acid. For example, in the past, boric acid was used to disinfect and treat wounds. Patients who received such treatment over and over again got sick and some died. Source: Medline Plus
Acetic Acid	Concentrated acetic acid is corrosive and must therefore be handled with appropriate care, since it can cause skin burns, permanent eye damage and irritation to the mucous membranes. Source: Wikipedia
Diatomaceous Earth	Acute accidental overexposure would be non-specific. Symptoms might include coughing, wheezing, difficulty breathing, and upper respiratory tract irritation. Chronic overexposure may cause pneumoconiosis (dusty lungs). Source: MSDS
Insecticidal Soap	May be hazardous to aquatic invertebrates. Do not apply directly to water; do not contaminate water by cleaning of equipment or disposal of washwaters

	Source: MSDS
Lime Sulphur	This product is caustic and will cause irritation to the skin and is corrosive to the eyes. Odour from this product may cause nausea. Environmental Effects: Do not contaminate local water supplies or environments. Source: MSDS

Submissions Advocating Against FeHEDTA:
Attachments Seven to Twelve outline submissions from organizations and individuals advocating against FeHEDTA. The submissions include:

- Real Alternatives to Toxins to the Environment (RATE)
- Dalhousie Biology Professor
- Pesticide Free Nova Scotia
- Ecology Action Centre
- Canadian Hemochromatosis Society
- Canadian Cancer Society

The summary of their concerns are as follows:

- Drift
- Soil Persistence
- Toxicity
- Groundwater/Drinking water Risks
- Handling risks
- Iron overload (to humans)
- Risk to Waterways and Aquatic Life
- Risky Ingredients

Supplementary Submissions Supporting the Inclusion of FeHEDTA:
In addition to the requests to add FeHEDTA to the Administrative Order, the following supplementary information (Attachments Thirteen to Seventeen) was received supporting the inclusion of FeHEDTA:

- Dr. Nernd Nowack
- Eco-Care Technologies
- Nathan Boyd, PhD, Nova Scotia Agricultural College
- MTE GlobalTox
- EPA Biopesticides Document

Following receipt of all of the information, staff questioned the submitters as follows and was given the succeeding responses:

Clearly, current policy directs me to vet this through OMRI. How can I consider this product?
• OMRI certifies products (fruits, vegetables, etc. and processes as organic). They do not offer certification around turf care activities so there is no opportunity to vet through OMRI. Essentially, there is not an "Organic" Lawn Certification. They do not certify any pesticides, their list provides guidance on what is allowable, restricted or prohibited with respect to

Organic labelling/certification. • Put forth that the EPA have certified as a Biopesticides (their low toxic alternatives) and PMRA/ Health Canada as a low risk pesticide • Lawn care is not a certifiable use site for OMRI
Drift
• FeHEDTA is not a misting product. It is spot treated.
Soil Persistence
• Firstly, not much reaches the soil, it is taken up by leaves • Breaks down quickly, even in higher ph soil by sun or quickly by microbes in soil • No accumulation • Lower levels of iron than moss or fertilizer and other lawn care products • Letter from Dr. Bernd Nowack (Attachment 12)
Toxicity
• Biopesticide for EPA (Attachment 17): Page 5: "... it has been determine that no unreasonable adverse effects to the US Population and the environment will result from the use of the active ingredient... Laboratory studies indicate that the active ingredient is not toxic following oral, inhalation or dermal exposure... There are no reports of adverse effects following human exposure to Iron HEDTA." • Low-risk PMRA stream • Summary of Toxicology Review: MTE GlobalTox (Attachment 16) • Other lawn care products have greater iron content: fertilizers/moss
Groundwater/Drinking water Risks/Aquatic Life
• Cannot reach water • Breaks down quickly • Reference GlobalTox Teport • EPA Report (p 9) "No significant drinking water exposure is expected from accumulation of Iron HEDTA in the aquatic environment... Iron HEDTA degrades readily in the environment"
Iron Overload
• Lower levels of iron than moss or fertilizer and other lawn care products

Upon examination of the original pesticide policy work, the impacts of FeHEDTA and comparison to other permitted products, staff suggest that rejection of this product would be contrary to the original intend of the By-Law and jeopardize reasonable anticipated deliberation around maintenance of the By-Law and fit with new Provincial Regulations.

The Pesticide By-Law is focused on protection of Human Health. The information provided suggests that there is not a significant risk to Human Health as intended within the By-Law.

EcoCare Technologies:
As per Attachment Fourteen, FeHEDTA was invented by Eco Care Technologies. They are a Canadian Research and Development company that has invented a number of low toxicity lawn care products including insecticidal soap, herbicidal soaps, and pyrethrin.

Recommendation on Municipal Usage:
Staff recommends against the usage of FeHEDTA for municipal (corporate) turf care operations.

There are several reasons for this, which are outside the scope of the Pesticide By-Law:

- The product is intended as a spot use. Municipal use would be much more intense.
- Municipal efforts to eradicate dandelions would be pyrrhic. It is put forth that this would be a waste of municipal funds.
- Dandelions provide environmental benefits.

Staff feels there is a need for stronger environmental policy for protection of watercourses in particular, and further restrictions on application of products including pesticides, fertilizers (a source of phosphorus), road salt, etc., are certainly within contemplation; but that need should not be confused with the intent of the strong HRM Pesticide By-Law put in place over ten years ago. That is policy consideration for another deliberation – likely related to work on the Storm Water Management Functional Plan or other Water Resource Management policy work that the Environment and Sustainability Committee will be seeing in the near future.

Dandelions are important plants for bees. Not only is their flowering used as an indicator that the honey bee season is starting, but they are also an important source of nectar and pollen early in the season. Dandelions are used as food plants by the larvae of some species of butterflies and moths. The annual value of honey bee pollination can be counted in the hundreds of millions of dollars. Bees pollinate about one-sixth of the world's flowering plant species and some 400 of its agricultural plants. Poorly pollinated plants produce fewer, often misshapen, fruits and lower yields of seed with inevitable consequences upon quality, availability and price of food.

Dandelions play an important role in biodiversity.

For these reasons, staff do not recommend using FeHEDTA on municipal operations. <u>But this rationale is not within the scope of the By-Law</u>. The focus of the By-Law is protection of Human Health.

Staff continues to support the recommendation, as per the annual Pesticide Program reports, that Pesticide regulation and restriction should be a provincial matter. However, there remains to be questions and shortfalls in the current regulations that appear to require continued maintenance of the HRM Pesticide By-Law.

Key Benefits of HRM By-Law over Provincial Regulations:

- Pre signage requirements
- Buffer zones
- Restricted Areas
- Notifications
- Ability to enforce permitting

BUDGET IMPLICATIONS

There are no budget implications related to this report.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

COMMUNITY ENGAGEMENT

There has been community and industry discussion and input to this report. Letters submitted are contained within the attachments.

ALTERNATIVES

The committee may choose to recommend against FeHEDTA. Clearly current policy would offer that result. However, staff suggest that this recommendation is not reasonable and would greatly jeopardize the integrity of the By-Law itself.

ATTACHMENTS

Attachment One:	Landscape Nova Scotia
Attachment Two:	Scotts Canada
Attachment Three:	Neudorff
Attachment Four:	Health Canada Registration
Attachment Five:	June 8, 2010 Report to Council
Attachment Six:	MSDS Sheet
Attachment Seven:	Real Alternatives to Toxins to the Environment (RATE)
Attachment Eight:	Dalhousie Biology Professor
Attachment Nine:	Pesticide Free Nova Scotia
Attachment Ten:	Ecology Action Centre
Attachment Eleven:	Canadian Hemochromatosis Society
Attachment Twelve:	Canadian Cancer Society
Attachment Thirteen:	Dr Nernd Nowack
Attachment Fourteen:	Eco-Care Technologies
Attachment Fifteen:	Nathan Boyd, PhD, Nova Scotia Agricultural College
Attachment Sixteen:	MTE GlobalTox
Attachment Seventeen:	EPA Biopesticides Document

A copy of this report can be obtained online at http://www.halifax.ca/commcoun/cc.html then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Richard MacLellan, Manager, Sustainable Environment Management Office, 490-6056

Landscape Nova Scotia

March 11, 2011

Environment and Sustainability Committee
Halifax Regional Municipality
PO Box 1749
Halifax, NS B2N 3H7

Re: Addition of Chelated Iron to HRM Permitted Pesticides List

Landscape Nova Scotia Horticultural Trades Association ("LNS") thanks the Committee for the opportunity to present its members' views concerning HRM By-law P800 on Pesticides (the "HRM Bylaw"). We write to request that chelated iron be added to the permitted list in Administrative Order 23 created under the HRM Bylaw.

About LNS

LNS represents landscaping and lawn care services, retail, lawn and garden equipment stores, nursery and greenhouse ornamental horticultural production, manufacturing, landscape architecture and design, greenhouse manufacturing, and wholesale trade. The landscape industry employs thousands of Nova Scotians and provides products and services to many more. LNS understands that Nova Scotians want to maintain healthy landscapes in an environmentally sustainable manner that does not create unacceptable risks to the health of people and animals. LNS shares these goals.

Background

In 2010 the Nova Scotia Government passed *Non-Essential Pesticides Control Act* (the "Act"), which bans the use of pesticides on lawns (effective April 1, 2011) and the use of pesticides on ornamental plants and gardens (effective April 1, 2012). Exceptions to the ban are provided for in the List of Allowable Pesticides (the "Allowable List"), which lists pesticides that can be legally sold and used. Our members who use pesticides will only be permitted to use products on the Allowable List after April 1, 2011.

Differences in Lists

As the Committee is aware, the Act is substantially similar to the HRM By-law; both ban the use of pesticides except for products included on a permitted list. A key difference, however, between the province's Allowable List and HRM's permitted list is the absence of chelated iron from HRM's permitted list. Chelated iron (also known by its formulation, FeHEDTA or its brand names, Fiesta and Weed-B-Gon) is included in the province's Allowable List but is not on HRM's permitted list. For our industry, this is an extremely important difference. We ask that the Committee add chelated iron to HRM's permitted list; our reasons follow.

Chelated Iron

Chelated iron is a low toxicity herbicide that is selectively absorbed by broadleaf weeds in excessive amounts, leading to plant mortality. Turf does not absorb the iron in the same manner as broadleaf weeds, which means that turf does not suffer damage. This mode of action makes it ideal as a lawn pesticide.

Chelated iron was already in wide use before its registration as a pesticide. It has been used for years as an iron fertilizer, including in the Nova Scotia golf, horticultural and greenhouse industries. In fact, one of our members who supplies chelated iron fertilizers noted that HRM uses chelated iron fertilizers in its greenhouses and for horticultural use. Chemically similar formulations to chelated iron are also common ingredients in many soaps and cosmetics and as dietary food supplements as approved by the World Health Organization.

Chelated iron is registered through the Biopesticide Division of the US Environmental Protection Agency and the low risk stream by the PMRA in Canada. The development of this product by Eco-Care Technologies Inc. is a Canadian success story; Eco-Care is a Canadian company that develops low risk, effective alternatives to conventional pesticides. It has invented insecticidal and herbicidal soaps and other low risk products, including some that are presently on HRM's permitted list. Chelated iron is permitted for use in all provinces that have implemented a pesticide ban or similar restrictions, including Nova Scotia, Ontario, Quebec, New Brunswick and Prince Edward Island.

Chelated iron is low risk to people, animals and the environment. It has a lower toxicity rating than many common household products (including some we ingest, such as table salt and Tylenol). It does not persist in the environment.

Why the Landscape Industry Wants Chelated Iron

Currently, HRM's permitted list includes only two products that are registered for use in treating weeds in lawns: Sarritor (permitted under biological control mechanisms) and Corn Gluten Meal. Both of these products have been used by our industry, but both have significant limitations in their use and effectiveness. It is essential to our industry and customers that we have access to chelated iron, which is the newest and most effective product for treating weeds in lawns. Chelated iron works, is in high demand from consumers and our customers, and it meets public and customer demands for low toxic, safe and effective products.

Why the Committee Should Add Chelated Iron to HRM's Permitted List

In June 2010, some of LNS' members made an application to HRM Council to add chelated iron to HRM's permitted list. This motion was defeated by Council. In the debate on chelated iron, there was no discussion on the merits of chelated iron or its safety. Rather the debate was on the relative merits and safety of pesticides generally, and whether HRM should act when the province was still in the process of finalizing its pesticide legislation. We believe now is the time for a full assessment of the merits of chelated iron and that when those merits are analyzed, the case to add it to HRM's permitted list is clear.

1. **Environmentally friendly**

We understand that the Committee has received submissions raising concerns about the impacts of chelated iron on health and the environment. However, LNS submits that scientific evidence shows chelated iron is a safe product that does not adversely impact the health of humans or animals, or have adverse impacts on the environment. The US Environmental Protection Agency agrees; Health Canada agrees; and "ban" provinces including Nova Scotia and Ontario agree. LNS supports and agrees with the submissions of Dr. Nathan Boyd of the Nova Scotia Agricultural College, Global Tox, Scotts Canada and Neudorff North America America on the safety and environmentally friendly profile of chelated iron.

2. **Need for consistency**

One of the primary criticisms of the HRM bylaw was that it was unable to restrict the sale of banned pesticides due to a lack of legislative authority to do so. Products that were banned from use were widely available on HRM store shelves. This also led to the situation where professionals licensed and trained in the use of pesticides (the lawn care industry) were not using certain pesticides banned in HRM, but homeowners who were not trained or licensed in the use of these banned products were using them. Since the enactment of the HRM Bylaw, members of our industry in the lawn care and retail/wholesale sectors have struggled to operate under this inconsistent regulatory situation.

When Nova Scotia enacted its pesticide legislation, it remedied this situation. Now the same products that are restricted from use are also restricted for sale. However, as long as HRM's permitted list is inconsistent with the Province's permitted list, this problem will persist in HRM. Products permitted by the Province will be for sale in HRM stores, but some of those products may still be prohibited from use in HRM because they are not on HRM's list. Chelated iron is the most prominent of those products and the product most widely in demand. HRM can remedy this problem by adding chelated iron to its permitted list.

3. **Maintain employment within lawn care industry**

Since the HRM ban was introduced, the lawn care industry has suffered contraction in both revenues and employment. This was despite major efforts that our industry has made to adapt to the new rules, including sourcing new products, changing the way we deliver our services, offering non-chemical services such as aeration, liming and seeding and educating our customers on proper cultural practices to reduce pest populations.

We believe that industry contraction was primarily a result of two factors. One is the "unlevel playing field" where homeowners had access to pesticides that the industry was prohibited from using. Secondly, there were very few products available that were effective in treating weeds in lawns. When our customers cannot achieve the results they have come to expect from our industry, they no longer buy our services. Under the new provincial rules, and with an effective product like chelated iron to offer, these problems no longer exist. We believe our industry will survive and can thrive under the new legislation. However, access to new products like chelated iron is key to our economic future.

Conclusion

Chelated iron is a product in high demand by the public, who want safe alternatives to conventional pesticides. LNS' customers who reside in HRM want this product, and our industry wants to provide it to them. We ask that the Committee recommend to Council that the HRM permitted list be amended to add chelated iron to the list.

Yours Truly,

David Thompson
Chair, Landscape Nova Scotia Environment Committee

March 11, 2011

Councillor Peter Lund, Chair
Environment and Sustainability Committee
Halifax Regional Municipality
1841 Argyle Street, PO Box 1749
Halifax, NS
B3J 3A5

Dear Councillor:

I am writing on behalf of Scotts Canada to respectfully request that the Environment and Sustainability Committee consider recommending to Regional Council that chelated iron (FeHEDTA) be added to HRM's pesticide bylaw permitted list.

Chelated iron is the active ingredient in EcoSense® WeedBGon® a first-of-its-kind, ready-to-use liquid weed control product that controls broadleaf weeds without harming grass. Chelated iron is also in Fiesta!, which is not a Scotts' product but is an important commercial herbicide for professional landscapers.

Derived from iron, which is ever-present in nature and even used as an important element in fertilizer, chelated iron is an effective, low risk means of eliminating widespread weed problems. When WeedBGon is applied to weeds, iron is absorbed into the cell structure of the plant. As oxidation destroys the plant from the inside out, the weed dries up and turns black. Within a few days, the weed is gone, but the grass around it remains healthy, because iron is a nutrient for turf.

Chelated iron is approved by the Pest Management Regulatory Agency and is on the permitted pesticide lists of the governments of Nova Scotia and Ontario.

It is important to understand that EcoSense WeedBGon is a "next generation" product that was partly developed in response to restrictions on the use of synthetic weed control products. It is the sort of new product HRM and other jurisdictions effectively asked manufacturers like Scotts to bring to market. It is therefore important that chelated iron be added to HRM's permitted list to ensure access to such innovative products and to encourage manufacturers to continue to develop other products that meet the expectations of Canadian provinces.

Also, there is currently considerable confusion being created by the fact that chelated iron is on the province's permitted list but not on HRM's. As a result, retailers are having difficulty planning their lawn and garden season store displays and are uncertain how best to advise customers. We are hopeful that the Committee will eliminate this confusion and regulatory overlap by recommending that chelated iron be added to HRM's permitted list.

Given retailers' need for clarification, and that lawn and garden season will soon begin, we respectfully request that the Committee decide this issue as soon as possible - at its April 7 meeting.

Scotts Canada Ltd.
2000 Argentia Road, Plaza 5, Suite 101, Mississauga, Ontario, Canada L5N 2R7
Tel: 905/814-7425 • Fax: 905/814-7392 • Website: www.scotts.ca

Headquartered in Mississauga, Ontario, Scotts Canada is a subsidiary of The Scotts Miracle-Gro Company, the world's leading provider of branded consumer products for home lawn and garden care. Scotts' lineup features Canada's favourite brands, including: Scotts®, Miracle-Gro®, Scotts® Turf Builder®, Scotts® EcoSense®, Ortho®, Morning Melodies Wild Bird Food and Roundup®.

Thank you for your consideration.

Yours truly,

Karen Stephenson
Director, Regulatory Affairs & Stakeholder Relations

cc: Richard MacLellan

Neudorff North America PO Box 178 Brentwood Bay B.C. V8M 1R3

March 14, 2011

Environment and Sustainability Committee
Halifax Regional Municipality
1841 Argyle Street, PO Box 1749
Halifax, NS B2N 3H7

RE: Addition of FeHEDTA to Administrative Order 23: Permitted Pesticides of the HRM Pesticide Bylaw (Bylaw P800)

To the Committee:

W. Neudorff GmbH KG (Neudorff), in association with Eco-Care Technologies Inc. (a Canadian R&D company), have developed low toxicity and environmentally friendly pesticide products for home and garden use and commercial/agricultural markets in Canada, the U.S., and worldwide for many years. After extensive research, Eco-Care developed a low toxicity, selective lawn herbicide based on iron in the form of FeHEDTA. This product is now available in Canada by Scotts as "Weed-B-Gon" and by Neudorff as "Fiesta" in the household and commercial lawncare sectors, respectively. Neudorff provides many of the existing low-risk alternatives to conventional pesticides today, and is proud to offer many of the products already included on Administrative Order 23: Permitted Pesticides of the HRM Pesticide Bylaw. We strongly support the addition of FeHEDTA (chelated iron) to Administrative Order 23.

FeHEDTA has been widely embraced as an effective and low-risk alternative to conventional selective herbicide products, such as 2,4-D, which has been banned in many jurisdictions. In 2008, FeHEDTA was reviewed and approved under the Biopesticide and Pollution Prevention Division (BPPD) of the U.S. Environmental Protection Agency (EPA), which is the division responsible for registration of biopesticides and promotes the use of low toxicity pesticides as components of IPM program. In 2010, FeHEDTA and the related end-use products were approved through the low-risk stream of Canada's Pest Management Regulatory Agency (PMRA). These approvals were based on the many favourable characteristics of this product including low toxicity to humans and non-target organisms, non-persistence in the environment and a long history of safe use. FeHEDTA has already been widely used for many years in fertilizers and industrial practices with no known reports of safety or toxicological concerns.

FeHEDTA has been reviewed and approved for use in the province of Nova Scotia under the Non-Essential Pesticides Control Act (effective April 2011), and is allowed in all other provinces of Canada that have enacted cosmetic pesticide bans, including Ontario, Quebec, New Brunswick, and Prince Edward Island. This Canadian invention has been extremely well received, and was even used in a demonstration of low-risk pesticides on the government legislature lawns in Ontario. FeHEDTA has been very successful in

filling the void left by the banning of some conventional pesticides to control invasive plants, noxious weeds, and other weed species.

WIDELY AVAILABLE TO THE PUBLIC FOR OTHER USES

Iron occurs naturally in the environment, and is the fourth most abundant element and the second most abundant metal in the Earth's crystal rocks. FeHEDTA is a well-known and widely-used, chelated-iron plant micronutrient. It is a common ingredient in fertilizers in Canada and in the U.S., and there have been no reports of toxicological concerns from the high volume use of this chemical worldwide. FeHEDTA has been applied as a liquid fertilizer (both soil and foliar applications) for many years to address iron deficiencies in turfgrass, vegetable/field/tree/vine crops and ornamental shrubs/trees. Trisodium HEDTA, which is the source of the HEDTA in the active ingredient, is commonly used in soaps and cosmetics.

LOW INHERENT TOXICITY TO NON-TARGET ORGANISMS

The toxicity of FeHEDTA to mammals and other non-target organisms is low, irrespective of exposure routes, with the end-use product acute oral and dermal LD_{50}s exceeding 5000 mg/kg. This is the lowest possible assessment of toxicity in standard toxicological studies. Despite lobbyist arguments to the contrary, extensive risk quotient assessments based on independent toxicology reports were reviewed by both the U.S. EPA and Health Canada, and it was determined that risks are negligible to honeybees, fish and aquatic invertebrates. Additionally, due to the intended use of FeHEDTA as a targeted foliar spray on terrestrial plants, exposure of non-target organisms is limited.

UNIQUE, SELECTIVE MODE OF ACTION

Dicots (such as broad-leaved weeds) and monocots (grasses) have different mechanisms for the uptake and transport of iron, which leads to the selectivity of the herbicide. The chelator in FeHEDTA significantly enhances the uptake of iron by dicots to the point where excessive iron is absorbed, leading to oxidative damage at the cellular level and plant death. This results from a common metabolic reaction within plants; therefore, pest resistance to FeHEDTA is not likely to occur.

ENVIRONMENTAL PERSISTENCE

FeHEDTA is chemically very similar to other iron salts of EDTA such as ferric sodium EDTA (FeEDTA), and environmental degradation of these substances is expected to be very similar. The main breakdown pathway of FeHEDTA, like FeEDTA, is photodegradation (degradation by sunlight) followed by biodegradation that occurs via microorganisms in wastewater, sediment and soil.

The iron from FeHEDTA is not expected to accumulate in the soil or groundwater. FeHEDTA meets the Health Canada criteria for low environmental persistence and is not expected to be persistent in soil or volatile in air. FeHEDTA has a half life of 14-56.8

minutes in water and less than 5 days in sediment, indicating rapid breakdown in these media. The photodegradation products of FeEDTA are identified as being biodegradable, and literature indicates that HEDTA may be even more readily biodegradable than EDTA. Additionally, the use patterns for this product (i.e. contact spray and spot applications, allowing time to dry) make it particularly susceptible to both photodegradation and microbial degradation in the aerobic soil beneath the lawn.

EXPOSURE

End-use products containing FeHEDTA are only labeled for use on lawns and turf. There are no food or feed crop uses.

Pesticide applicators loading or applying end-use products containing FeHEDTA and/or entering freshly treated areas may be exposed to the product. However, FeHEDTA has low toxicity to non-target organisms and occupational exposure is expected to be low based on directions for use. In addition, the final product is diluted one in twenty-five with water prior to application. Finally, humans have had equivalent exposure to FeHEDTA, without reports of toxicological concern, as it has been used as a fertilizer for many years. The herbicidal uses for FeHEDTA will be similar to the fertilizer uses but the herbicidal use sites are even more limited as they will be restricted to lawns and turf.

To summarize, FeHEDTA met all of the low-risk criteria to be evaluated and approved by the Biopesticide Division of the U.S. EPA and the low-risk stream of the PMRA, and would be an appropriate addition to Administrative Order 23. Worldwide pesticide regulatory agencies, including Health Canada, use independent, peer-reviewed, science-based systems to thoroughly evaluate pesticide products. We strongly encourage the Committee to also make their recommendations based on the available scientific evidence.

The invention of low-risk, environmentally friendly FeHEDTA selective herbicide products is a true Canadian success story. With excellent efficacy, low toxicological and environmental risks, and history of safe use in Canada, FeHEDTA has strong value and has been widely embraced in areas of Canada with cosmetic pesticide bans. Neudorff strongly supports the inclusion of FeHEDTA on Administrative Order 23 of the HRM Pesticide Bylaw.

Sincerely,

Lauren Strachan, M.Sc.

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Health Canada Santé Canada

Your health and safety... our priority. *Votre santé et votre sécurité... notre priorité.*

Registration Decision RD2010-09

FeHEDTA

(publié aussi en français) **22 September 2010**

This document is published by the Health Canada Pest Management Regulatory Agency. For further information, please contact:

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Ottawa, Ontario
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Registration Decision for FeHEDTA

Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the *Pest Control Products Act* and Regulations, is granting full registration for the sale and use of NEU1173H TGAI and the end-use products; NEU1173H RTU with Pull'N Spray Applicator, NEU1173H RTU with Quick Connect Sprayer, NEU1173H RTU, Fiesta Lawn Weed Killer Ready to Spray, Fiesta Lawn Weed Killer, NEU1173H Ready to Spray Large Size, NEU1173H Ready to Spray, NEU1173H Large Size, and NEU1173H, containing the technical grade active ingredient iron present as FeHEDTA (herein referred to as FeHEDTA), to control several broadleaved weed species that commonly occur in turf.

An evaluation of available scientific information found that, under the approved conditions of use, the product has value and does not present an unacceptable risk to human health or the environment.

These products were first proposed for registration in the consultation document[1] Proposed Registration Decision PRD2010-03, *FeHEDTA*. This Registration Decision[2] describes this stage of the PMRA's regulatory process for FeHEDTA and summarizes the Agency's decision, the reasons for it and provides, in Appendix I, a summary of comments received during the consultation process as well as the PMRA's response to these comments. This decision is consistent with the proposed registration decision stated in PRD2010-03.

For more details on the information presented in this Registration Decision, please refer to the Proposed Registration Decision PRD2010-03, *FeHEDTA* that contains a detailed evaluation of the information submitted in support of this registration.

What Does Health Canada Consider When Making a Registration Decision?

The key objective of the *Pest Control Products Act* is to prevent unacceptable risks to people and the environment from the use of pest control products. Health or environmental risk is considered acceptable[3] if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its conditions of registration. The Act also requires that products have value[4] when used according to label directions. Conditions of registration may include special precautionary measures on the product label to further reduce risk.

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1 "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act.*

2 "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act.*

3 "Acceptable risks" as defined by subsection 2(2) of the *Pest Control Products Act.*

4 "Value" as defined by subsection 2(1) of the *Pest Control Products Act* "...the 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".

To reach its decisions, the PMRA applies modern, rigorous risk-assessment methods and policies. These methods consider the unique characteristics of sensitive subpopulations in humans (for example, children) as well as organisms in the environment (e.g. those most sensitive to environmental contaminants). These methods and policies also consider the nature of the effects observed and the uncertainties when predicting the impact of pesticides. For more information on how the PMRA regulates pesticides, the assessment process and risk-reduction programs, please visit the Pesticides and Pest Management portion of Health Canada's website at healthcanada.gc.ca/pmra.

What Is FeHEDTA?

Iron is a metallic chemical element (symbol "Fe") that acts as a selective herbicide when chelated with hydroxyethylenediaminetriacetic acid (HEDTA) to form FeHEDTA. Broadleaved plants are generally more susceptible to the herbicidal effects of FeHEDTA than are grass species. The mechanism of selectivity is not entirely understood but is believed to relate in part to differences in uptake. As Fe can function as a catalyst for oxygen reduction, thereby producing unstable and highly reactive oxygen species, including hydroxyl radicals that cause cellular damage, the excessive uptake of FeHEDTA by many broadleaved species leads to tissue necrosis and ultimately plant death.

Health Considerations

Can Approved Uses of FeHEDTA Affect Human Health?

FeHEDTA is unlikely to affect your health when used according to label directions.

Exposure to FeHEDTA may occur when handling and applying the product. When assessing health risks, two key factors are considered: the levels where no health effects occur and the levels to which people may be exposed. The dose levels used to assess risks are established to protect the most sensitive human population (for example, children and nursing mothers). Only uses for which the exposure is well below levels that cause no effects in animal testing are considered acceptable for registration.

The technical grade active ingredient, FeHEDTA, is of low acute toxicity by the oral, dermal and inhalation routes and is minimally irritating to eyes, but non-irritating to skin. There is potential for skin sensitization to occur when skin is repeatedly exposed to FeHEDTA products. Therefore, cautionary statements alerting users to this sensitization concern are required on all product labels.

Dermal exposure is likely for commercial applicators, domestic users or anyone entering sprayed areas before the spray is dried. Children may also be exposed to FeHEDTA by direct dermal or hand-to-mouth contact if they were to play on freshly treated lawn surfaces. Therefore, a restricted entry statement is required on all product labels to mitigate this exposure concern.

Waivers were granted for short-term dermal toxicity, prenatal development toxicity and genotoxicity studies based on the low application rates, low dermal absorption, low toxicity of FeHEDTA, and on the strength of toxicological information on chemically similar EDTA compounds.

Residues in Water and Food

Dietary risks from food and water are not of concern.

End-use products containing FeHEDTA are not applied directly to food or feed crops, so residues on food are expected to be negligible.

Occupational Risks From Handling FeHEDTA

Occupational risks are not of concern when FeHEDTA is used according to label directions, which include protective measures.

Occupational and residential exposure is expected to be brief, and is not likely to result in unacceptable risk to commercial applicators, occupational workers, and domestic users if the end-use products are used according to label directions.

The proposed use of the end-use products may result in exposure to the commercial applicators, domestic-users, mixers, loaders, and those responsible for clean-up and maintenance activities, but significant risks from such exposures are not anticipated due to the low toxicity of FeHEDTA and adequate exposure mitigation measures recommended on the labels. For bystanders, exposure is expected to be negligible. Therefore, health risks to bystanders are not of concern.

Precautionary and hygiene statements on the labels are considered adequate to protect individuals from any unnecessary risk from occupational exposure.

Environmental Considerations

What Happens When FeHEDTA Is Introduced Into the Environment?

FeHEDTA is expected to be non-persistent in the environment (terrestrial and aquatic) under neutral to alkaline aerobic conditions. FeHEDTA has a potential for high mobility in sandy soil with negligible organic matter. FeHEDTA is expected to impact broadleaf terrestrial plants; therefore, a precautionary label statement is needed for the protection of desirable plants.

Iron is ubiquitous in the environment. FeHEDTA is widely used as a plant micronutrient fertilizer in agricultural industries. Based on its low volatility, FeHEDTA is not expected to enter the atmosphere. FeHEDTA is soluble in water where it is rapidly degraded by natural light. FeHEDTA is transformed by micro-organisms in soil and aquatic systems, although it is relatively stable in anaerobic soils. No major products are formed in soil and water. From the

proposed use pattern, the amount of FeHEDTA entering the environment will be lower than for other agricultural uses.

FeHEDTA is expected to pose negligible risk to terrestrial and aquatic organisms under conditions of use for application to turf.

Value Considerations

What Is the Value of FeHEDTA

FeHEDTA controls several broadleaved weed species that commonly occur in turf. It is an alternative to conventional herbicides. FeHEDTA is compatible with integrated weed management practices in that it is applied only when weeds have emerged and is not used as a "preventative" treatment.

Measures to Minimize Risk

Labels of registered pesticide products include specific instructions for use. Directions include risk-reduction measures to protect human and environmental health. These directions must be followed by law.

The key risk-reduction measures being proposed on the labels of the end-use products NEU1173H RTU with Pull'N Spray Applicator, NEU1173H RTU with Quick Connect Sprayer, NEU1173H RTU, Fiesta Lawn Weed Killer Ready to Spray, Fiesta Lawn Weed Killer, NEU1173H Ready to Spray Large Size, NEU1173H Ready to Spray, NEU1173H Large Size, and NEU1173H to address the potential risks identified in this assessment are as follows.

Key Risk-Reduction Measures

Human Health

Because there is a concern with domestic-users coming into direct contact with FeHEDTA on the hands and then transferring to mouth, the labels recommend "avoid hand-to-mouth contact" and require commercial applicators/domestic-users and workers to wash hands thoroughly with soap and water after handling the products and before eating, drinking, and chewing gum or chewing tobacco.

The labels specify that anyone handling or applying these products should "avoid breathing vapour or spray mist" and "avoid contact with skin or clothing." Domestic product labels should include the statement "DO NOT get in eyes."

To protect children and adults from dermal exposure to FeHEDTA from wet treated turf, the labels should include the restricted entry statement, "Do not re-enter or allow re-entry into treated areas until the spray is dried."

The signal words "POTENTIAL SKIN SENSITIZER" and the statement "May cause skin sensitization" are required on the principal and the secondary display panels, respectively, of both the technical and end-use product labels.

To prevent inappropriate use, the secondary display panel of the technical label should include the statement "PREVENT ACCESS BY UNAUTHORIZED PERSONNEL."

Personal protective equipment (PPE) recommended include protective eye-wear for commercial products and waterproof gloves for both commercial and domestic products which require loading, mixing, and for repair/clean-up activities.

The application of commercial products is recommended only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools, and recreational areas is minimal; taking into consideration wind speed, wind direction, temperature, application equipment, and sprayer settings.

Other Information

The relevant test data on which the decision is based (as referenced in this document) are available for public inspection, upon application, in the PMRA's Reading Room (located in Ottawa). For more information, please contact the PMRA's Pest Management Information Service by phone (1-800-267-6315) or by e-mail (pmra.infoserv@hc-sc.gc.ca).

Any person may file a notice of objection[5] regarding this registration decision within 60 days from the date of publication of this Registration Decision. For more information regarding the basis for objecting (which must be based on scientific grounds), please refer to the Pesticides and Pest Management portion of Health Canada's website (Request a Reconsideration of Decision, healthcanada.gc.ca/pmra) or contact the PMRA's Pest Management Information Service by phone (1-800-267-6315) or by e-mail (pmra.infoserv@hc-sc.gc.ca).

[5] As per subsection 35(1) of the *Pest Control Products Act*.

Appendix I Comments and Responses

1. Comments on the registering of products for domestic use.
A comment was received in which the suitability of registering domestic products was questioned due to the potential for misuse by non-licensed users.

Response:
The assessment of risk for domestic products takes into consideration the proposed use pattern and the target user while addressing exposure to sensitive populations (such as children and nursing mothers). Residential exposure for these products is expected to be brief, and is not likely to result in unacceptable risk to domestic users, sensitive populations or bystanders when the end-use products are used according to label directions.

2. Comments on the use of independent scientific data.
In the document Proposed Registration Decision – *FeHEDTA* (PRD2010-03), it was noted that the data used to support the value review was generated by the applicant and it was recommended that independent scientific value data should be considered.

Response:
Health Canada carefully evaluates new pesticides according to rigorous scientific standards to ensure that the product poses no risk to human health or the environment, and has value when used according to the directions on the product label.

Companies applying to register a pesticide in Canada are required to develop a comprehensive database of studies that will allow Health Canada to determine the potential risks posed to human health and the environment and the pesticides' value. It is the responsibility of the manufacturer to carry out these detailed scientific studies in accordance with internationally accepted test guidelines.

The use of internationally accepted test guidelines promote the quality and validity of test data by addressing the organizational process and conditions under which studies are planned, performed, monitored, recorded and reported. Independent trial audits may be conducted under the good laboratory practices guidelines at anytime to verify the integrity of data.

Health Canada requires product specific value data as the formulation in an end use product can have an affect on the performance of an active ingredient. For the application to register FeHEDTA and its end use products, the value data submitted by the registrant were found to be sufficient to demonstrate acceptable control of the weeds that will appear on the product label with the condition that additional confirmatory data for the listed weeds be submitted.

Comments on the application rates and potential phytotoxicity to turf.
In the document Proposed Registration Decision – *FeHEDTA* (PRD2010-03), two comments on the potential for phytotoxicity to turf grass were received. It was questioned if the application rate could be lowered in order to remove any possibility of damage to turf grass.

Response:
The efficacy information submitted indicates that the application rates supported by the PMRA are required for control of the weeds listed on the product label.

The product label contains statements warning of possible, but transient injury to turf grass, and advises the user to test the product on a small area. In consideration of the low levels of injury reported in the information submitted by the registrant (generally 5-7% or less, and declining over time), in combination with the efficacy of the product for control of several common broadleaved turf weeds, the level of tolerance of the labeled turf grasses to these products is considered to be acceptable. Given the range of factors that may influence a plant's response to a herbicide application, it is not possible to provide a quantification of potential levels of injury on a product label. The precautionary statements are therefore added to indicate that the potential for injury to the turf exists.

Comments on the use of the term 'natural'.
In the document Proposed Registration Decision – *FeHEDTA* (PRD2010-03), Section 5.5.1 Survey of Alternatives, the term 'natural' was used to describe a registered active ingredient. The comment was that the use of this term is not consistent with the advice to registrants and applicants in the Regulatory Directive, DIR96-02: *Environmental Label Claims and Advertising of Pest Control Products.*

Response:
DIR96-02 is intended to inform the pesticide industry of the requirements for using environmental claims on pest control products, in order to ensure responsible labeling and advertising. In DIR96-02 it states that "no further consideration will be given to the use of the term "natural" as an environmental claim for pest control products".

The PMRA acknowledges that the term 'natural' was inadvertently used in error in PRD2010-03.

References

A. List of Studies/Information Submitted by Registrant

1.0 Chemistry

PMRA Document Number	Reference
1753329	1753329 2009, Binder 2 Amended, DACO: 2.0, 2.1, 2.11, 2.11.1, 2.11.2, 2.11.3, 2.11.4, 2.12, 2.12.1, 2.12.2, 2.13, 2.13.1, 2.13.2, 2.13.3, 2.13.4, 2.14, 2.14.1, 2.14.10, 2.14.11, 2.14.12, 2.14.13, 2.14.14, 2.14.2, 2.14.3, 2.14.4, 2.14.5, 2.14.6, 2.14.7, 2.14.8, 2.14.9, 2.15, 2.16,2.2, 2.3, 2.3.1, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9 CBI
1791534	2009, NEU1173H TGAI Clarification Response, DACO: 0.1.6003, 2.11.2, 2.11.3, 2.12.2, 2.13.1 CBI
1753341	2009, 5-batch Analysis of NEU1173H TGAI - HEDTA, DACO: 2.13.3 CBI
1768339	2009, 5-Batch Analysis of Neu 1173H TGAI, DACO: 2.13, 2.13.1, 2.13.2, 2.13.3 CBI
1768340	2009, 5-Batch Analysis of Neu 1173H TGAI Appendices, DACO: 2.13, 2.13.1, 2.13.2, 2.13.3 CBI
1768341	2009, 5-Batch Analysis of Neu1173H TGAI for Nitrilotriacetate, Ethylenediaminetetraacetate and Hydroxyacetate, DACO: 2.13, 2.13.1, 2.13.2, 2.13.3 CBI
1753345	2009, Analysis of Iron in NEU1173H by ICP-MS in support of Eco-Care Study 1173-2W54-2M40-081216 "Accelerated (w weeks 54C, 2 months 40C) Storage Stability of NEU1173H", DACO: 2.14.14 CBI
1791535	2007, Method SOP IC/003, DACO: 2.13.1 CBI
1791536	2008, Method SOP 91-CM-006-00, DACO: 2.13.1 CBI
1791537	2009, NEU1173H TGAI Chromatograms, DACO: 2.11.3 CBI
1791534	2009, NEU1173H TGAI Clarification Response, DACO: 0.1.6003, 2.11.2, 2.11.3, 2.12.2, 2.13.1 CBI
1768838	Binder 2 Addendum June 23, 2009, DACO: 2.0, 2.11.4, 2.12, 2.12.1, 2.12.2, 2.13, 2.13.1, 2.13.2, 2.13.3, 2.13.4 CBI

1566571	2008, Binder 2, DACO: 2.0, 2.1, 2.11, 2.11.1, 2.11.2, 2.11.3, 2.11.4, 2.12, 2.12.1, 2.12.2, 2.13, 2.13.1, 2.13.2, 2.13.3, 2.13.4, 2.14, 2.14.1, 2.14.10, 2.14.11, 2.14.12, 2.14.13, 2.14.14, 2.14.2, 2.14.3, 2.14.4, 2.14.5, 2.14.6, 2.14.7, 2.14.8, 2.14.9, 2.2, 2.3, 2.3.1, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9 CBI
1566574	2008, Ambient (1 year) Storage Stability of NEU1173H, DACO: 2.14.14 CBI
1753343	2009, UV Visible Absorption, DACO: 2.14.12 CBI
1753390	2009, Binder 2 Addendum, DACO: 3.0, 3.2.1, 3.2.2, 3.3.1, 3.3.2, 3.4, 3.4.1, 3.5, 3.5.10, 3.5.6, 3.5.7, 3.5.8, 3.7 CBI
1566835	2008, CBI Reference Document to Binder 2, DACO: 3.2.1, 3.2.2, 3.3.1 CBI
1566831	2008, Binder 2, DACO: 3.0, 3.1, 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2, 3.2.1, 3.2.2, 3.2.3, 3.3.1, 3.3.2, 3.4, 3.4.1, 3.4.2, 3.5, 3.5.1, 3.5.10, 3.5.11, 3.5.12, 3.5.13, 3.5.14, 3.5.15, 3.5.2, 3.5.3, 3.5.4, 3.5.5, 3.5.6, 3.5.7, 3.5.8, 3.5.9
1566834	2008, Ambient (1 year) Storage Stability of NEU1173H RTU, DACO: 3.5.10
1753394	2008, Physical and Chemical Characteristics: Oxidation/Reduction, DACO: 3.5.8 CBI
1753395	2009, Analysis of Iron in Neu1173H RTU by ICP-MS in support of eco-Care Study 1173RTU-2W54-2M40-081216 "Accelerated (2 weeks, 54C, 2 months, 40C) Storage Stability of NEU1173H RTU, DACO: 3.5.10 CBI
1790668	2009, Storage Stability Data, DACO: 3.5.10 CBI
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B. Additional Information Considered

i) Published Information

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HALIFAX
REGIONAL MUNICIPALITY

PO Box 1749
Halifax, Nova Scotia
B3J 3A5, Canada

Item No. 11.1.5
Halifax Regional Council
June 8, 2010

TO: Mayor Kelly and Members of Halifax Regional Council

SUBMITTED BY: Wayne Anstey, Acting Chief Administrative Officer

DATE: May 18, 2010

SUBJECT: Amendment to Administrative Order #23, Respecting Pesticides, Herbicides and Insecticides - Notice of Motion to Add FeHEDTA (for lawn use) to the Permitted Pesticides List

ORIGIN

This report originates from Administrative Order 23, and staff receipt of Industry Requests for amendment.

RECOMMENDATION

It is recommended that Halifax Regional Council, approve in principle the addition of FeHEDTA, for lawn use, to the Permitted Pesticides List in Administrative Order #23 and direct staff to initiate the formal legislative process.

BACKGROUND

Administrative Order #23, Respecting Pesticides, Herbicides, and Insecticides Excluded From the Pesticide By-Law, is a companion document to the Pesticide By-Law P800, and provides a list of Permitted Pesticides that are excluded from the provisions of the Pesticide By-Law. It was approved by Regional Council in 2000. The list includes such products as Insecticidal Soaps, Bacillus Thuringgiensis, Dormant Oils, Lime Sulphur, etc.

In order to facilitate the addition/deletion of substances from Administrative Order #23, staff have provided a protocol to amend the Permitted Pesticides List. This protocol has resulted in the addition of Diatomaceous Earth, Acetic Acid and, most recently (in 2005), Corn Gluten Meal.

DISCUSSION

Staff have received a request from HalifaxSeed, Weedman, and Edmonds Landscaping to add FeHEDTA to the Permitted List in Administrative Order #23.

What Is FeHEDTA?
Iron is a metallic chemical element (symbol "Fe") that acts as a selective herbicide when chelated with hydroxyethylenediaminetriacetic acid (HEDTA) to form FeHEDTA.

Broadleaved plants are generally more susceptible to the herbicidal effects of FeHEDTA than are grass species. The mechanism of selectivity is not entirely understood but is believed to relate in part to differences in uptake. As Fe can function as a catalyst for oxygen reduction, thereby producing unstable and highly reactive oxygen species, including hydroxyl radicals that cause cellular damage, the excessive uptake of FeHEDTA, by many broadleaved species, leads to tissue necrosis and ultimately plant death.

Attachment One is the submission (since approved) to Pesticide Management Regulatory Agency (PMRA). It provides much information on the product. Attachment Two is the PMRA Product Label. Attachment Three is the Ontario Approval.

According to the Procedures to Amend the Permitted Pesticides List in Administrative Order #23, substances must satisfy the following requirements:

1. Full disclosure of all ingredients of any material/ substance being considered.
2. The material/substance must not be prohibited by OMRI (Organic Material Review Institute) in their generic names list.

3. The material/substance must not be prohibited from use in Canada.
4. Proposed substances/materials not presently listed on OMRI's generic names list shall be referred to OMRI for review and recommendation at the cost of the applicant.
5. Whereas advance notice to the public on Administrative Order #23 is required through brochures, newsletters, etc., it is recommended that unless there are exceptional circumstances, an annual process be completed by February 15th of each year to amend the list of Permitted Pesticides.
6. These procedures shall be reviewed periodically by the appropriate staff to help ensure they remain up to date and effective.

Since this protocol was created in 2001, other provinces and municipalities have adopted pesticide restriction and regulations. Recently, the Province of Nova Scotia passed legislation that will mirror the Ontario Pesticide regulations which will become effective in 2011.

Based on the Ontario Regulations (which the Union of Nova Scotia Municipalities) recommended the Province of Nova Scotia develop their pesticide legislation around), HRM staff are recommending support of this industry request for addition of this product to the Approved List. In reviewing the 2001 protocol, this request meets the primary requirements, with the exception of OMRI approval for the generic product. It is not specifically prohibited nor approved. Iron is approved, with restrictions for use for organic use.

In addition to the above protocol, Sustainable Environment Management Office (SEMO) staff conducted basic research on the usage of the product. It appears that this product meets the intent of the HRM Pesticide By-Law and should be on the permitted list.

Staff is committed to facilitating the widest possible list of acceptable permitted substances for use by HRM residents.

With the recently passed Provincial Legislation Respecting Pesticides, it is anticipated and planned that HRM will no longer administer its By-Law and Administrative Order after this season.

BUDGET IMPLICATIONS

There are no budget implication to this action. Existing staff resources will update the HRM literature on the internet site.

FINANCIAL MANAGEMENT POLICIES/BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

ALTERNATIVES

Regional Council may choose to not approve adding FeHEDTA to the Approved List.

ATTACHMENTS

Attachment One: Submission to PMRA
Attachment Two: Label
Attachment Three: Ontario Approval

A copy of this report can be obtained online at http://www.halifax.ca/council/agendasc/cagenda.html then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Richard MacLellan, Manager - SEMO, 490-6056

Financial Approval by: Cathie O'Toole

Cathie O'Toole, CGA, Director of Finance, 490-6308

Report Approved by: Phillip Townsend, Director, Infrastructure and Asset Management, 490-7166

(Workbook Version – November 2009)

Proposed Registration Decision

FeHEDTA

PMRA Document Number: 1841244

Overview

Proposed Registration Decision for FeHEDTA

Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the *Pest Control Products Act* and Regulations, is proposing full registration for the sale and use of NEU1173H TGAI and the end-use products; NEU1173H RTU with Pull'N Spray Applicator, NEU1173H RTU with Quick Connect Sprayer, NEU1173H RTU, Fiesta Lawn Weed Killer Ready to Spray, Fiesta Lawn Weed Killer, NEU1173H Ready to Spray Large Size, NEU1173H Ready to Spray, NEU1173H Large Size, and NEU1173H, containing the technical grade active ingredient iron present as FeHEDTA (herein referred to as FeHEDTA), to control several broadleaved weed species that commonly occur in turf.

An evaluation of available scientific information found that, under the approved conditions of use, the product has value and does not present an unacceptable risk to human health or the environment.

This Overview describes the key points of the evaluation, while the Science Evaluation provides detailed technical information on the human health, environmental and value assessments of NEU1173H TGAI and the end-use products; NEU1173H RTU with Pull'N Spray Applicator, NEU1173H RTU with Quick Connect Sprayer, NEU1173H RTU, Fiesta Lawn Weed Killer Ready to Spray, Fiesta Lawn Weed Killer, NEU1173H Ready to Spray Large Size, NEU1173H Ready to Spray, NEU1173H Large Size, and NEU1173H.

What Does Health Canada Consider When Making a Registration Decision?

The key objective of the *Pest Control Products Act* is to prevent unacceptable risks to people and the environment from the use of pest control products. Health or environmental risk is considered acceptable[1] if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its proposed conditions of registration. The Act also requires that products have value[2] when used according to the label directions. Conditions of registration may include special precautionary measures on the product label to further reduce risk.

To reach its decisions, the PMRA applies modern, rigorous risk-assessment methods and policies. These methods consider the unique characteristics of sensitive subpopulations in humans (e.g. children) as well as organisms in the environment (e.g. those most sensitive to environmental

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1 "Acceptable risks" as defined by subsection 2(2) of the *Pest Control Products Act*.

2 "Value" as defined by subsection 2(1) of the *Pest Control Products Act*: "the 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."

NEU1173H RTU
WITH PULL'N SPRAY® APPLICATOR

Solution

DOMESTIC
READY-TO-USE
SELECTIVE HERBICIDE

GUARANTEE: Iron (present as FeHEDTA) 0.25%

Contains 5-chloro-2-methyl-4-izothiazolin-3-one at 0.0007571% and
2-methyl-4-izothiazolin-3-one at 0.0002479%, as preservatives

REG. NO.: 29531 P.C.P. ACT

READ THE LABEL BEFORE USING
KEEP OUT OF REACH OF CHILDREN

POTENTIAL SKIN SENSITIZER

NET CONTENTS: 5 L

Registrant:
W. Neudorff GmbH KG
An der Muhle 3, Postfach 1209
D-31860 Emmerthal, Germany
www.neudorff.com

Canadian Agent:
Eco-Care Technologies Inc., 8233 Thomson Pl,
Saanichton, BC V8M 1S1
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1812911 Pra, D et al., 2007, Genotoxicity and mutagenicity of iron and copper in mice, Biometals (2008) 21:289-297, DACO: 4.8

3.0 Value

Romheld, V. and H. Marschner. 1986. Evidence for a Specific Uptake System for Iron Phytosiderophores in Roots of Grasses. Plant Physiol. 80: 175-180.

For use on lawn turf consisting of one or more of Kentucky bluegrass, perennial ryegrass, and fescue (tall fescue, chewings fescue, and/or creeping fescue) for control or suppression of broadleaf weeds.

PESTS/SITES:
Controls the following lawn weeds: Dandelion, English daisy, False dandelion, White clover, Black medic, Bull thistle, Canada thistle, Common chickweed, Creeping buttercup, Slender speedwell, Narrow-leaved plantain, Broad-leaved plantain (suppression only), Dove's-foot geranium, Lawn burweed, Moss, and Algae.

With pressure sprayer.

[Text for inside Arrow]

Pull'N Spray® Applicator

[ILLUSTRATION #1]

- Remove sprayer from side carrier and unwrap hose completely.
- Insert plug at end of hose into spout on cap until it clicks.
- Flip up spout.

ILLUSTRATION #2]

- Point sprayer away from body.
- Grasp sprayer by the handle.
- SLOWLY pull ring at bottom of sprayer handle until it stops to ready the sprayer.

[ILLUSTRATION #3]

- Twist nozzle at end of sprayer to adjust spray pattern.

[ILLUSTRATION #4]

- Press button on sprayer to begin spraying and hold down for continuous spray.
- Pull ring at sprayer bottom again as needed for additional spraying.

DIRECTIONS FOR USE
SHAKE WELL BEFORE USING. Do not dilute. Follow illustrations and instructions to ready the sprayer. Twist nozzle at end of sprayer to open and adjust spray pattern. Point sprayer away from body and press sprayer button to begin spraying. Pull ring at base of sprayer as needed to continue spraying. Hold down for continuous spray. Spray weeds until foliage is thoroughly wetted, just to the point of run-off. Repeat treatment once in four or more weeks after the first treatment if necessary.
Visible signs of control may be seen within several hours after application. Susceptible weeds, moss or algae will turn brown or black. Occasionally a darkening of the grass leaf blades can occur after treatment; however the grass will recover within a few days to weeks. May stain thatch (dead grass under lawn); this does not affect the health of the grass.
Use Precautions: Do not apply to drought stressed grass; ensure lawn is well watered prior to application. Do not apply when the daytime temperature will exceed 30°C. Do not apply to bentgrass. If unsure of grass sensitivity, test spray a small area of your lawn. Apply to established turf only. Do not apply to newly seeded areas or to turf generated from seed and that is less than one year old. Avoid spraying desirable

plants. Any desirable plants or structures accidentally contacted should be rinsed with water. To avoid staining, wait until treated area dries before re-entry. Do not apply if rainfall is expected within 3 hours of application. Do not irrigate within 3 hours of application. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

PRECAUTIONS:
CAUTION: KEEP OUT OF REACH OF CHILDREN. Causes slight eye irritation. Avoid contact with skin or clothing. Wash hands thoroughly with soap and water after handling and before eating, drinking, and chewing gum or chewing tobacco.
DO NOT get in eyes. Avoid hand-to-mouth contact. Avoid breathing spray mist. Do not re-enter or allow re-entry into treated areas until the spray is dried. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

FIRST AID:
If swallowed:
Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.
If on skin or clothing:
Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 - 20 minutes. Call a poison control centre or doctor for treatment advice.
If inhaled:
Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.
If in eyes:
Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.
Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

TOXICOLOGICAL INFORMATION:
Treat symptomatically.

STORAGE:
Store this product in its original container and keep in a secure storage area out of reach of children and domestic animals. Store unused material, tightly closed, in original container only, away from open flame. Protect from freezing. To prevent contamination store this product away from food or feed.

DISPOSAL:
Do not reuse empty container. Dispose of empty container with household garbage. Unused or partially used products should be disposed at provincially or municipally designated hazardous waste disposal sites.

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.

Pull'N Spray® is a registered trademark of OMS Investments, Inc., used under license by Scotts Canada Ltd.

SELECTIVE BROADLEAF HERBICIDE

Made with iron

People and pets can enter treated area when spray dries.

No unpleasant odor.

Ontario

Ministry of the Environment
Pesticides Advisory Committee

P.O.Box 2434
2300 Yonge Street, Suite 1701
Toronto ON M4P 1E4

Tel: 416/314-9235/9230
Fax: 416-314-9237
www.opac.gov.on.ca

Ministère de l'Environnement
Comité consultative sur les pesticides

C.P. 2434
2300, rue Yonge, Bureau 1701
Toronto ON M4P 1E4

Tél.: 416-314-9235/9230
Téléc.: 416-314-9237
www.opac.gov.on.ca

May 5, 2010

W. Neudorff GmbH KG
Germany

Dear Registrant:

This letter is to advise that the following product(s) has been classified by the Director under the Pesticides Act in accordance with Ontario Regulation 63/09:

Reg#	Class	Name
29535	4	Fiesta Lawn Weed Killer
29539	6	NEU117311

This product(s) was classified on April 30, 2010 and effective this date it is legal for sale and use in Ontario. Classified products will be posted on the Ministry of the Environment website: http://www.ene.gov.on.ca/en/land/pesticides/class-pesticides.php and updated in the ministry's pesticide database.

If you have any questions concerning this decision please contact the Ontario Pesticide Advisory Committee (OPAC) office at 416-314-9230.

Note that section 8 of Ontario Regulation 63/09 requires registrants whose products are classified into Classes 1 to 7 to notify OPAC of any changes in a pesticide's registration or label within 30 days after you were notified of the change by Health Canada's Pest Management Regulatory Agency.

Yours truly,

Douglas Mewett
Executive Secretary

MATERIAL SAFETY DATA SHEET

Manufactured for : W. Neudorff GmbH KG
Canadian Contact: Neudorff North America
11-6782 Veyaness Rd.
Saanichton, BC Canada
V8M 2C2

Date: March 17, 2010
Supersedes: March 10, 2010
Telephone: 250-652-5888

I. PRODUCT INFORMATION

Product:	**Fiesta Lawn Weed Killer** **P.C.P. Act No. 29535**
Chemical Name:	Proprietary
Chemical Family:	Iron salts

IIa. HAZARDOUS INGREDIENTS

Components	%	Hazard Information
Sodium Nitrate	19 - 21	Oxidant, Irritant
Nitrilotriacetic acid (NTA)	0.5 - 0.8	Toxic

IIb. NON-HAZARDOUS INGREDIENTS

Components	%	Hazard Information
Iron HEDTA	25.07 – 27.97	
(Iron)	4.21 – 4.65	

III. PHYSICAL AND CHEMICAL CHARACTERISTICS (FIRE AND EXPLOSION DATA)

Solubility in Water:	Miscible in all proportions
Appearance and Odor:	Red-brown liquid with slight ammonia smell
Flash Point (°C):	Non combustible
Specific Gravity, 25°C:	1.41 ± 0.01
pH:	6.00 ± 1.00
Extinguishing Media for Fires:	Water, CO_2, foams
Special Fire Fighting Procedures:	Normal extinguishing procedures

N/A - not applicable, NAV - not available, ca. - approximately

IV. PHYSICAL HAZARDS

Stability:	Product is stable
Conditions to Avoid:	Exposure to excessive heat
Materials to Avoid:	Aluminum, zinc, steel
Hazardous Decomposition Products:	NH_3, NO_x
Hazardous Polymerization Conditions:	None known

V. HEALTH HAZARD DATA

LD_{50} (oral) NAV (rat)>2000 mg/kg LD_{50} (dermal) NAV
LC_{50} (fish): NAV
Carcinogen or Potential Carcinogen NTP:no IARC:no OSHA: no
Routes of Entry:

Skin:	Slight irritant
Eyes:	causes slight irritation (reversible)
Ingestion:	May cause cramps or nausea
Inhalation	Slight irritant
Medical Conditions Aggravated:	

VI. EMERGENCY FIRST AID PROCEDURES

Skin:	Wash thoroughly with soap and water
Eyes:	Flush eyes with plenty of water, consult a physician immediately.
Ingestion:	Do not induce vomiting. Give water for dilution effect and contact a physician.
Inhalation:	Move to fresh air.

VII. SPECIAL PROTECTION INFORMATION

Ventilation:	Adequate ventilation for aerosol should be provided.
Respiratory Protection:	None required
Eye Protection:	Chemical safety goggles.
Protective Gloves:	Impervious gloves

VIII. SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Storage Recommendations:	Store at ambient temperatures.
Spill or Leak Procedures:	Absorb large spills with absorbent materials
Disposal Recommendations:	Dispose of in accordance with local regulations.

14-APR-2010
2008-0966

FIESTA LAWN WEED KILLER Ready-to-Spray
Solution

COMMERCIAL
SELECTIVE HERBICIDE
CONCENTRATE

GUARANTEE: Iron (present as FeHEDTA) 4.43%

REG. NO.: 29534 P.C.P. ACT

READ THE LABEL BEFORE USING
POTENTIAL SKIN SENSITIZER

NET CONTENTS: 1 - 100 Litres

Registrant:
W. Neudorff GmbH KG
An der Muhle 3, Postfach 1209
D-31860 Emmerthal, Germany
www.neudorff.com

Canadian Agent:
Eco-Care Technologies Inc.
8233 Thomson Pl,
Saanichton, BC V8M 1S1
Telephone: 250-652-5510

For use on lawns and turf (on rights of way, non-crop areas, golf courses, parks, cemeteries and athletic fields) consisting of one or more of Kentucky bluegrass, perennial ryegrass, and fescue (tall fescue, chewings fescue, and/or creeping fescue) for the control of dandelion *(Taraxacum officinale)*, English daisy *(Bellis perennis)*, false dandelion *(Hypochaeris radicata)*, white clover *(Trifolium repens)*, black medic *(Medicago lupulina)*, bull thistle *(Cirsium vulgare)*, Canada thistle *(Cirsium arvense)*, common chickweed *(Stellaria media)*, creeping buttercup *(Ranunculus repens)*, slender speedwell *(Veronica filiformis)*, narrow-leaved plantain *(Plantago lanceolata)*, dove's-foot geranium *(Geranium molle)*, lawn burweed *(Soliva pterosperma)*, moss and algae, and for the suppression of broad-leaved plantain *(Plantago major)*.

APPLICATOR DIRECTIONS:

ATTACH HOSE *[optional diagrams]*	OPEN SYSTEM *[optional diagrams]*	TURN ON AND SPRAY *[optional diagrams]*
• Ensure that the large Water Control Knob is turned to the "OFF" position. • Connect sprayer to hose of water.	• Turn the small Product Control Button so that the flat side aligns with the tab on the right side of the button, and push the button all the way in. • Turn on water at faucet.	• To spray, point nozzle where you want to spray and turn the large knob all the way to the left. Product will be automatically diluted to the proper concentration. Spray evenly over measured area at a rate of 200 to 400 ml spray/m^2. Use the lower rate (200 ml spray/m^2) on small weeds; use the higher rate (400 ml/m^2) on large weeds and on tough perennial weeds, such as clover. • To stop spraying, push small Product Control Button in from opposite side. Turn large Water Control Knob to the right to the "OFF" position and turn off faucet. • NOTE: BEFORE DISCONNECTING HOSE (to relieve water pressure): Turn large Water Control Knob to the left; then turn "OFF" again. • Disconnect hose of water from sprayer. • To prevent accidental discharge when not in use, turn the small Product Control Button so that it is NOT aligned with the tab and cannot be pushed in.

DIRECTIONS FOR USE:

SHAKE WELL BEFORE USING. One litre of product will treat between 62.5 and 125 m^2 (672.5 and 1345 ft^2). Thorough and uniform coverage is important. Water lawn 24 hour after each application. Repeat treatment once in four or more weeks after the first treatment if necessary. For spot treatment, spray weeds until foliage is thoroughly wetted, just to the point of runoff.

Visible signs of control may be seen within several hours after application. Susceptible weeds, moss or algae will turn brown or black Occasionally a darkening of the grass leaf blades can occur after treatment, however the grass will recover within a few days to weeks. May stain thatch (dead grass under lawn); this does not affect the health of the grass.

Use Precautions: Do not apply to drought stressed grass; ensure lawn is well watered prior to application. Do not apply when the daytime temperature will exceed 30°C. Do not apply to bentgrass. If unsure of grass sensitivity, test spray a small area of your lawn. Apply to established turf only. Do not apply to newly seeded areas or to turf generated from seed and that is less than one year old. Avoid spraying desirable plants. Any desirable plants or structures accidentally contacted should be rinsed with

water. To avoid staining, wait until treated area dries before re-entry. Do not apply if rainfall is expected within 3 hours of application. Do not irrigate within 3 hours of application. Do not apply more than 2 times per year. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

PRECAUTIONS:
KEEP OUT OF REACH OF CHILDREN. CAUTION: Causes slight eye irritation. Avoid contact with eyes, skin, or clothing. Wash hands thoroughly with soap and water after handling and before eating, drinking, and chewing gum or chewing tobacco. Wear protective eye-wear and waterproof gloves during application or during mixing, loading, and repair/clean-up activities. Avoid breathing vapour or spray mist. Do not re-enter or allow re-entry into treated areas until the spray is dried. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools, and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature, application equipment, and sprayer settings.

FIRST AID:
If swallowed:
Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.
If on skin or clothing:
Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 - 20 minutes. Call a poison control centre or doctor for treatment advice.
If inhaled:
Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.
If in eyes:
Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.
Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

TOXICOLOGICAL INFORMATION:
Treat symptomatically.

STORAGE
To prevent contamination store this product away from food or feed. Store in a secure place, away from open fire or flame. Keep container closed and reseal after use. If spilled, use absorbent materials and dispose of in an approved manner. Do not store at temperatures below 0°C.
DISPOSAL:
DO NOT reuse this container for any purpose. This is a recyclable container, and is to be disposed of at a container collection site. Contact your local distributor/dealer or

municipality for the location of the nearest collection site. Before taking the container to the collection site:

1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.

2. Make the empty, rinsed container unsuitable for further use.

If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer or the provincial regulatory agency in case of a spill, and for clean-up of spills.

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.

Patent Pending

Manufactured for:
W. Neudorff GmbH KG
Postfach 1209, An der Muehle 3, 31860 Emmerthal, Germany
Canadian Office: Neudorff North America
Unit 11 • 6782 Veyaness Road • Saanichton, BC, V8M 2C2 • 1-(250)-652-5888

SELECTIVE BROADLEAF WEED KILLER
People and pets can enter treated area when spray dries.
No unpleasant odor.
Made with iron.

****

This label transcript service is offered by the Pest Management Regulatory Agency to provide efficient searching for label information. This service and this information do not replace the official hard-copy label. The PMRA does not provide any guarantee or assurance that the information obtained through this service is accurate, current or correct, and is therefore not liable for any loss resulting, directly or indirectly, from reliance upon this service.

MATERIAL SAFETY DATA SHEET

Manufactured for : W. Neudorff GmbH KG
Canadian Contact: Neudorff North America
11-6782 Veyaness Rd.
Saanichton, BC Canada
V8M 2C2

Date: March 17, 2010
Supersedes: March 10, 2010
Telephone: 250-652-5888

I. PRODUCT INFORMATION

Product:	**Fiesta Lawn Weed Killer** **P.C.P. Act No. 29535**
Chemical Name:	Proprietary
Chemical Family:	Iron salts

IIa. HAZARDOUS INGREDIENTS

Components	%	Hazard Information
Sodium Nitrate	19 - 21	Oxidant, Irritant
Nitrilotriacetic acid (NTA)	0.5 - 0.8	Toxic

IIb. NON-HAZARDOUS INGREDIENTS

Components	%	Hazard Information
Iron HEDTA	25.07 – 27.97	
(Iron)	4.21 – 4.65	

III. PHYSICAL AND CHEMICAL CHARACTERISTICS (FIRE AND EXPLOSION DATA)

Solubility in Water:	Miscible in all proportions
Appearance and Odor:	Red-brown liquid with slight ammonia smell
Flash Point (°C):	Non combustible
Specific Gravity, 25°C:	1.41 ± 0.01
pH:	6.00 ± 1.00
Extinguishing Media for Fires:	Water, CO_2, foams
Special Fire Fighting Procedures:	Normal extinguishing procedures

N/A - not applicable, NAV - not available, ca. - approximately

IV. PHYSICAL HAZARDS

Stability:	Product is stable
Conditions to Avoid:	Exposure to excessive heat
Materials to Avoid:	Aluminum, zinc, steel
Hazardous Decomposition Products:	NH_3, NO_x
Hazardous Polymerization Conditions:	None known

V. HEALTH HAZARD DATA

LD_{50} (oral) NAV (rat)>2000 mg/kg LD_{50} (dermal) NAV
LC_{50} (fish): NAV
Carcinogen or Potential Carcinogen NTP:no IARC:no OSHA: no
Routes of Entry:

Skin:	Slight irritant
Eyes:	causes slight irritation (reversible)
Ingestion:	May cause cramps or nausea
Inhalation	Slight irritant
Medical Conditions Aggravated:	

VI. EMERGENCY FIRST AID PROCEDURES

Skin:	Wash thoroughly with soap and water
Eyes:	Flush eyes with plenty of water, consult a physician immediately.
Ingestion:	Do not induce vomiting. Give water for dilution effect and contact a physician.
Inhalation:	Move to fresh air.

VII. SPECIAL PROTECTION INFORMATION

Ventilation:	Adequate ventilation for aerosol should be provided.
Respiratory Protection:	None required
Eye Protection:	Chemical safety goggles.
Protective Gloves:	Impervious gloves

VIII. SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Storage Recommendations:	Store at ambient temperatures.
Spill or Leak Procedures:	Absorb large spills with absorbent materials
Disposal Recommendations:	Dispose of in accordance with local regulations.

To Councillor Peter Lund, Chair, and All Members of the
Environment and Sustainability Standing Committee
Halifax Regional Municipality (HRM)
Box1749
Halifax, Nova Scotia B3J 3A5

Fiesta/FeHEDTA: An Allowable Material in HRM?
Submitted by Real Alternatives To Toxins To The Environment (RATE)

March 2, 2011

When considering whether or not to add iron-based herbicides (FeHEDTA/Fiesta) to Administrative Order 23, one must look at the reason for creating our cosmetic landscape Pesticide Bylaw in the first place. The pesticide bylaw was designed and passed in order to prevent toxic products drifting throughout our urban neighbourhoods. Parents were worried and residents reported these were making them ill. The public was concerned that relying only on label instructions on pesticide products would not provide the same level of public health protection as a ban on cosmetic landscape pesticides.

Any pesticide use should be looked at for its risk/benefit ratio. According to a letter from Dr. Robert Strang, the Chief Public Health Officer of Nova Scotia: "For each specific use of pesticides (e.g. landscape, agriculture, forestry, pest and vector control) the determination of reasonable steps to minimize use should be based on an analysis of the risks and benefits of that specific use." A large benefit coupled with little risk is usually seen as acceptable, but a small benefit coupled with any degree of risk is not. Controlling malarial mosquitoes has a different risk/benefit ratio than controlling weeds in lawns in order to achieve a preconceived monoculture ideal, and these uses should be assessed differently. In agriculture the "benefit" is typically equated to the crop value, but in a residential context, no such crop (other than our children) exists.

FeHEDTA/Fiesta as a benefit and as a risk:

Concerns and Risks Regarding FeHEDTA/Fiesta	Benefits of FeHEDTA /Fiesta
The application of commercial products **is "recommended only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools, and recreational areas is minimal; taking into consideration wind speed, wind direction, temperature, application equipment, and sprayer settings."** - PMRA Website: http://www.hc-sc.gc.ca/cps-spc/pest/index-eng.php/, accessed February 22, 2011 Many areas of HRM would not meet these recommended conditions.	Another tool for the landscape industry
It is expected to be non-persistent under neutral to alkaline (pH 7-8) aerobic soil conditions ($t_{1/2} < 30$ d) but persistent in acidic soils ($t_{1/2} > 30$ d). **The half-life or persistent build-up of iron and other formulants could be much greater in Nova Scotian soils than in the less acidic Ontario soils where it was recently approved for use.** Bacterial breakdown in acidic soils may be slower also. The PMRA may not have	Partial control of some weeds in turf

assessed the sequelae of the anticipated increase in soil persistence in this province. If repeated applications result in additive accumulation, what would be the effect on skin absorption or the amount tracked into the home? FeHEDTA will not transform (is more persistent) under anaerobic conditions.[1] Robert Martin, Regulatory Information Officer / Agent d'information sur la réglementation, Pest Management Regulatory Agency/Agence de réglementation de la lute antiparasitaire 2720 Riverside Drive, Ottawa, ON, K1A 0K9, 1-800-267-6315 (Within Canada), 613-736-3799 (Elsewhere)36-3799 (Elsewhere)	
The PMRA granted waivers for required studies evaluating short-term dermal toxicity, prenatal development toxicity and genotoxicity. Assumptions were made that application rates would be low, dermal absorption would be low, and the toxicity of FeHEDTA would be low. (based on toxicological information obtained for chemically *similar* EDTA compounds, not from FeHEDTA itself). - PMRA website (paraphrased) It is worrisome that only similar products were tested and that prenatal toxicity tests were skipped (especially when one study showed that EDTA in large amounts can cause mineral deficiencies that result in toxicological effects) - Information from Anda Beach, Neudorff of North America	Convenience and income increased for industry because products could be used in both Nova Scotia and Ontario
GROUNDWATER/DRINKING WATER RISKS **Sodium Nitrate and Nitrilotriacetic Acid (NTA) Risks** In assessing the safety of a pesticide it is important to also consider "unlisted" ingredients. Fiesta contains at least two other ingredients of concern. **The hazardous materials, according to their respective Material Safety Data Sheets (MSDS) are Sodium Nitrate - 19 to 21 percent, and Nitrilotriacetic Acid (NTA) .05 to .08 percent,** MSDS, Fiesta Lawn Weed Killer P.C.P. Act No. 29535 "CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (some evidence.) by NTP." The MSDS for NTA also warns of potential carcinogenic effects, and that "the substance may be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organ damage." These risks were not elaborated on the MSDS for Fiesta type herbicides. These ingredients may pose a real risk to children via drinking water. The MSDS for Sodium Nitrate reads: "Sodium nitrate may react with secondary or tertiary amines to form **nitrosamines** (certain nitrosamines are cancer suspect agents)... most cases of **clinical infantile methemoglobinaemia** have occurred at levels exceeding 100 mg nitrate/L." The ingestion of sodium nitrate is a concern when the product breaks down or runs off into drinking wells, and then baby bottles or cereals are prepared with this water. A local hydrogeologist estimated there were at least 20.000 drinking water wells in HRM, underlining the potential to impact a significant number of families. Leaf detritus in wells and	

surface water in combination with chlorine may also increase the formation of nitrosamines.	
Cautionary notes for human health listed by the PMRA for Fiesta include **"avoid hand-to-mouth contact"** and users and workers are urged to wash hands thoroughly with soap and water after handling the products and before eating, drinking, and chewing gum or chewing tobacco. **Anyone handling or applying these products should** "avoid breathing vapour or spray mist" and "avoid contact with skin or clothing." (These are common behaviours by the community on residential lawns.)	
"Hereditary Hemochromatosis (HHC) is the most common genetic disorder affecting Canadians. It is a crippling, potentially fatal condition caused by a defect of iron metabolism that leads to **iron overload** in vital organs, joints and tissues." www.toomuchiron.ca **"1 in 9 Canadians carries the mutated gene for Hemochromatosis"** -The Canadian Hemochromatosis Society(CHS)* Iron-based herbicides, such as FeHEDTA or Fiesta, may pose a real risk to residents in the municipality with Hemochromatosis. HRM's population was 372,679 in 2006. At least 1 in 200 or 300 are affected, so between 1,242 and 1,863 or more would have Type 1 HHC in HRM. Any additional skin absorption or ingestion of iron from landscape sources or from residues tracked into the home may cause problems for those with this metabolic disorder, as well as to children in general. In children, iron is a very common cause of poisoning. It seems common sense that even without a genetic predisposition, the effects of ingesting excessive Iron or involuntary skin absorption resulting from playing on the lawn could be additive and could conceivably cause serious health problems in some children. *Canadian Hemochromatosis Society, Suite 272 - 7000 Minoru Blvd Richmond, BC Canada V6Y 3Z5, Toll-Free (Canada): 1-877-BAD-IRON (1-877-223-4766 Tel: (604) 279-7135 , E-mail: office@toomuchiron.ca , Web: www.toomuchiron.ca	
"The signal words **"POTENTIAL SKIN SENSITIZER"** and the statement "May cause skin sensitization" on labels. **Note:** skin sensitization is not necessarily an allergy to the product. Anecdotal reports describe pesticide skin sensitizers that have triggered a previously unknown condition that may then last for years.	
"Do not re-enter or allow re-entry into treated areas until the spray is dried." - PMRA website	
Protective clothing and eyes protection must be worn when using this product – Label instructions	
Four incident reports for FeHEDTA in 2010 are posted at http://pr-rp.hc-sc.gc.ca/pi-ip/actives-eng.php?p_letter=I (item #13) Click on the number four in the far right hand column. Three are pet incident reports with effects ranging from "moderate" to "death."	
Risks to Waterways and Aquatic Life	

There are indications that FeHEDTA lawn care products (notably Fiesta) harm the environment, particularly aquatic life. It has been established that iron, the active ingredient, can be toxic to aquatic plants and animals.[1] It has not been established that this iron-based product can be kept out of the many sensitive waterways of HRM. One assessment of FeHEDTA warns that the iron in these chelates interacts with the hemocyanin (an oxygen transport blood pigment equivalent in importance to haemoglobin) in the bloodstream of mollusks and crustaceans, and could be toxic to these organisms. FeHEDTA is likely also to be toxic to amphibians (source: product information provided by the company). Lower populations of amphibians could result in more mosquitoes and other vector born diseases. It is possible such risks to aquatic systems violate the Habitat Protection and Pollution Prevention Provisions of the federal Fisheries Act. (Note: the Fisheries Act takes precedence over provincial and municipal law). There is no instruction on the label requiring that wetlands and streams be avoided when applying the herbicide, other than relating to cleaning equipment or disposal of chemicals. Anda Beach of Neudorff of North America: [1] Physiological Responses of Five Seagrass Species to Trace Metals, J.A. Prange and W.C. Dennison, Department of Botany, University of Queensland, Brisbane, Australia and National Research Centre for Environmental Toxicology, 2000.	
Compared with other herbicides, industry sources report problems with staining and with a marked increase in the quantity of this product that is needed to get results.	
Economic points: When the manufacturing head office of a product is located out of province or out of the country, money spent locally on natural lawn care services generally stays in the community, circulating in the local economy, while the reverse is true of income derived from the sale of products manufactured elsewhere. Further, in a regional municipality so economically dependent on aquatic life for income and survival, prudence suggests requiring further study for approval.	

There are many concerns regarding Fiesta. One certainty is that our community has learned to do without this type of herbicide for 10 years. The monoculture that would be encouraged by the use of this herbicide

is also not compatible with the concept of a biodiverse lawn that the province and city is trying to encourage.

In short, product risks would seem to be a blend of 'unknown or undetermined' and 'known and worrisome.' The limited research evidence available on FeHEDTA is cause for concern. Precautionary Principle guidelines would therefore strongly suggest waiting until further medical and environmental research is in, and the product manufacturers meet their obligation to prove that FeHEDTA products are safe.

> Precautionary Principle: When we use the precautionary principle or precautionary approach we ask if an action or policy has a suspected risk of causing harm to the public or to the environment. In the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is *not* harmful falls on those taking the action. This principle allows policy makers to make discretionary decisions in situations where there is the possibility of harm from following a particular course or making a certain decision when extensive scientific knowledge on the matter is lacking. The principle implies that there is a social responsibility to protect the public from exposure to harm, when scientific investigation has found a plausible risk. These protections can be relaxed only if further scientific findings emerge that provide sound evidence that no harm will result.

Respectfully prepared and submitted by Real Alternatives To Toxins in The Environment (RATE)

We hope this is useful in your deliberations.

Contact person for further information and questions,

Helen Jones M.Sc., Hon. Zool (UBC), Ed.D. (Col. Univ.)

Previous Member of Pesticide Free Nova Scotia
Previous Member of the Pesticide Bylaw Advisory Committee for the HRM
Board Member of Real Alternatives to Toxins in the Environment (RATE)

March 2, 2011

From: **David Patriquin**
Professor of Biology (retired)

To: **Councillor Peter Lund (Chair) and Members of the Environment and Sustainability Standing Committee (Halifax Regional Municipality Regional Council)**

cc: **Richard MacLellan,** Manager, Sustainable Environment Management Office (SEMO)
cc: Krista Tidgwell, legislative assistant

Re: **Administrative Order No. 23, FeHEDTA & Concerns Related to Impacts of Permitted Materials on Aquatic Organisms**

I am writing in regard to pending discussion about whether to maintain Administrative Order No. 23, which I understand, will be the topic of a Committee meeting on March 3, 2011, also to comment on the possible listing of FeHEDTA on Administrative Order No. 23.

I think it is important to recognize that HRM has been a leader in regard to the regulation of cosmetic pesticides across Canada. Other communities have modeled their approaches based on HRM, and it was HRM's successes that led the province to adopt province-wide legislation to control cosmetic use of pesticides through the Non-essential Pesticides Control Act

This is an important step, but it does not obviate the need or appropriateness of HRM maintaining its By-law, including Administrative Order 23. HRM benefits by having BOTH the HRM Pesticide By-Law (including Administrative Order 23) AND the Provincial Act (the Non-essential Pesticides Control Act).

The latter addresses sales of materials, an area not covered by HRM's Pesticide By-law, while the HRM Pesticide By-law affords a much higher degree of protection through signage, buffer zones etc, as elaborated by RATE (http://chart.ratens.ca) and, potentially, by use of a more focused or precautionary list of Permitted Materials made possible by Administrative Order No. 23.

I suggest it is very desirable for HRM to maintain Administrative Order 23, as it allows a higher degree of control by HRM than would be provided by the Provincial list alone. With Administrative Order 23, HRM is able to move more quickly, should it wish, were new information to become available indicating that

A material on the list poses previously unrecognized risks, or otherwise to apply more restrictions on materials than provided by the Provincial Act. This allows HRM to maintain more flexibility and protection for HRM residents and wildlife. At the same time, there is no obligation to be out in front of the province in regard to Permitted Materials, but it is a definite benefit to have that option should we need it. It would also be consistent with HRM's leadership in this area in the past to maintain this flexibility. I therefore urge HRM to maintain Administrative Order No. 23.

An area that I think deserves special attention from HRM, and that could benefit from retaining Administrative Order 23, is the effect of permitted materials, or proposed permitted materials, on aquatic organisms. I suggest it deserves special attention for two reasons:

(i) HRM is an area of high concentration of lakes, rivers and streams which are highly valued for recreational use.

(ii) Some materials that are listed currently as permissible under both the Provincial Act & the HRM By-law are highly toxic to aquatic organisms, notably Pyrethrins and Neem. (Neem is not listed but is used as a plant health promoter by some lawncare enterprises, apparently with the tacit approval of the PMRA.) Please see UPDATE: Use of Pyrethrins and Neem Oil to Control Chinch Bug (http://versicolor.ca/lawns/docs/updateAug07.html) for some comments about these materials.

FeEDTA

The issue of whether to allow FeHEDTA is another case in point. The document **Item No. 11.1.5 Halifax Regional Council June 8, 2010 (SUBJECT: Amendment to Administrative Order #23, Respecting Pesticides, Herbicides and Insecticides - Notice of Motion to Add FeHEDTA (for lawn use) to the Permitted Pesticides List)** includes in full a relevant PMRA Document: **Proposed Registration Decision FeHEDTA PMRA Document Number: 1841244**. From the latter:

--FeHEDTA is expected to be non-persistent in the environment (terrestrial and aquatic) under neutral to alkaline aerobic conditions.

--FeHEDTA has a potential for high mobility in sandy soil with negligible organic matter.

--Available information on the effects of iron in ferric sodium EDTA on non-target organisms indicates that the iron in these chelates interacts with the

hemocyanin in the bloodstream of molluscs and crustaceans, and would be toxic to these organisms.

The PMRA document goes on..."However, exposure to freshwater molluscs and crustaceans as well as amphibians is unlikely to occur given the intended use of FeHEDTA as a broadleaf herbicide applied directly to targeted terrestrial plants."

In regard to HRM, it should be noted that:

(i) soils and water in HRM are generally acidic to very acidic, and many of our lakes with depths greater than 5-6 meters contain anaerobic zones, thus the first statement does not apply well, if at all, to HRM;

(ii) in regard to the second statement above: many, probably most, of our turfs (including lawns) are on shallow sandy soils with low organic matter, so we can expect high mobility in these environments;

(iii) the PMRA acknowledges the toxicity of FeHEDTA to aquatic organisms but suggests that this is not a problem because of "the intended use of FeHEDTA as a broadleaf herbicide applied directly to targeted terrestrial plants." However, many of our turfs slope directly into lakes, or drain into storm sewers that go into streams and lakes.

So *in our area,* HRM, these critical assumptions in the PMRA document do NOT apply and extensive use of this material would likely result in significant deleterious impacts on aquatic organisms. As FeHEDTA based products are essentially replacements for traditional broadleaf herbicides, it is likely they would be highly promoted and used if permitted. That would undo a lot of the progress HRM has made since introducing the Pesticide By-law in promoting truly sustainable techniques.

It is pertinent, as noted in the HRM document cited above, that FeHEDTA is NOT approved by OMRI, and that

"According to the Procedures to Amend the Permitted Pesticides List in Administrative Order #23, substances must satisfy the following requirements... 2. The material/substance must not be prohibited by OMRI (Organic Material Review Institute) in their generic names list."

The HRM staff document goes on to say

"this request meets the primary requirements, with the exception of OMRI approval for the generic product. It is not specifically prohibited nor approved. Iron is approved, with restrictions for use for organic use."

The last part of this statement is gobbly gunk to justify not applying the OMRI criteria. It is well understood if a material is not on the OMRI list, it is not permitted, further, the forms of iron that are allowed under OMRI are not EDTA forms, and they do have restrictions. This case is in fact a good example of how the OMRI lists are appropriately precautionary and why we should maintain Administrative Order No 23 and its connection to the OMRI lists, rather than to begin making exceptions to it. (If we do, that will open the door to many more requests, making it unworkable.)

I therefore urge that Administrative Order 23 and its connection to the OMRI lists be maintained and that FeHEDTA not be added to Administrative Order 23.

In the longer term, I hope HRM will look also at some restrictions on Pyrethrins and Neem (e.g., requiring a permit, as under organic certification) because of their impacts on aquatic organisms, and in regard to pyrethrins, their toxicological effects on people. (Pyrethrins/pyrethroids are now the major cause of pesticide incidents in the domestic environment.) We are at the wettest end of the country (except perhaps for coastal B.C., and Newfoundland), and HRM, unlike other areas in the province, has a high concentration of turfs that drain into our streams, lakes, and rivers. Thus there is a good rationale for adding some additional restrictions on cosmetic pesticides to those are or might be specified at the provincial or national levels.

Respectfully,

David Patriquin

David G. Patriquin
Professsor of Biology, Dalhousie University (retired)
Past member of the PMRA Advisory Council
Author, Control of Chinchbug Without Pesticides (versicolor.ca/lawns)
President, Halifax Field Naturalists halifaxfieldnaturalists.ca)
Co-Chair, Woodens River Environmental Organization (wrweo.ca)

Pesticide Free Nova Scotia

March 2, 2011

Fiesta (FeHEDTA): Known and Unknown Risks

The risks of FeHEDTA include known and sobering as well as uncertain risks. The limited evidence available on FeHEDTA is cause for concern. The prudent course of action under the Precautionary Principle[1] is to await further medical and environmental research. Product manufacturers are obliged to prove that FeHEDTA products are safe before exposing people and the environment to them.

Key concerns include:

Drift

Health Canada's Pest Management Regulatory Agency (PMRA) recommends the application of FeHEDTA only when the potential for drift to areas of human habitation or activity (such as houses, cottages, schools, and recreational areas) is minimal. Underlining this point, the PMRA further recommends "taking into consideration wind speed, wind direction, temperature, application equipment, and sprayer settings."[2] It is difficult to imagine where this product could be safely used in HRM residential areas under PMRA guidelines. Most of HRM is densely built for human activity, replete with houses, cottages, schools and recreational areas.

Greater Soil Persistence of Iron in Acidic Maritime Soils

FeHEDTA is expected to be non-persistent under neutral to alkaline aerobic soil conditions but persistent in acidic soils such as those in Nova Scotia. Ontario soils are less acidic, so the half life or persistent build up of FeHEDTA in local soils will be much greater than in Ontario, where the Fiesta product was recently approved. If repeated applications result in additive accumulation, what would be the effect on skin absorption data or track-in to the home? Further, under anaerobic conditions, FeHEDTA will not breakdown or transform.[3]

Risky Inert Ingredients: Sodium Nitrate and Nitrilotriacetic Acid (NTA)

In assessing the safety of a pesticide it is important to also consider unlisted ingredients. Fiesta contains significant amounts of at least two other ingredients of potential concern: Sodium Nitrate and Nitrilotriacetic Acid (NTA).

These ingredients may pose a risk to children via drinking water. The Material Safety Data Sheet on Sodium Nitrate reads: "Sodium nitrate may react with secondary or tertiary amines to form nitrosamines (certain nitrosamines are cancer suspect agents)...most cases of clinical infantile methaemoglobinaemia associated with the ingestion of nitrate in drinking water have occurred at levels exceeding 100 mg nitrate/L." The ingestion of sodium nitrate is a concern when the product breaks down or runs off into drinking wells and baby bottles or cereals are made with this water. In 1998 a local hydrogeologist estimated there were 20,000-25,000 drinking water wells in the HRM.[4]

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[1] According to pprinciple.net, the Precautionary Principle is a "response to uncertainty, in the face of risks to health or the environment. In general, it involves acting to avoid serious or irreversible potential harm, despite lack of scientific certainty as to the likelihood, magnitude, or causation of that harm. Precaution is now an established principle of environmental governance, prominent in law, policy and management instruments at international, regional and domestic level, across such diverse areas as pollution, toxic chemicals, food and phytosanitary standards, fisheries management, species introductions and wildlife trade."

[2] PMRA Website: http://www.hc-sc.gc.ca/cps-spc/pest/index-eng.php/, accessed February 22, 2011

[3] Robert Martin, Regulatory Information Officer, Pest Management Regulatory Agency, 2720 Riverside Drive, Ottawa, ON, K1A 0K9, 1-800-267-6315

[4] The study was conducted by Rick Gagne, founder of RG Hydro-Environmental Ltd., a Halifax-based groundwater and environmental consulting firm which has since been renamed earth-water Concepts (ewC). Gagne can be reached at 457-7010.

The MSDS for NTA warns of potential carcinogenic effects, and that "the substance may be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organ damage."

Risks to Waterways and Aquatic Life

There are indications that FeHEDTA-based lawncare products harm the environment, particularly aquatic life. It has been established that iron, the active ingredient, can be toxic to aquatic plants and animals.[5] It has not been established that this iron-based product can be kept out of the many sensitive waterways of HRM.

Further, an assessment of FeHEDTA indicates that iron in these products interacts with hemocyanin (an oxygen transport blood pigment equivalent in importance to haemoglobin) in the bloodstream of mollusks and crustaceans – a toxic interaction.[6] FeHEDTA is likely also toxic to amphibians. It is possible posing such risks to aquatic systems violates the Habitat Protection and Pollution Prevention Provisions of the federal Fisheries Act.

In a regional municipality so economically dependent on aquatic life for income and survival, prudence demands awaiting further study before considering approving this product.

Prepared by Members of Pesticide Free Nova Scotia

Chris Benjamin
Healthy Lawns Coordinator
Ecology Action Centre

Maureen Reynolds
Past Member Pesticide Bylaw Advisory Committee (HRM)
Board Member Real Alternatives to Toxins in the Environment

Members of Pesticide Free Nova Scotia:
Canadian Cancer Society
Canadians for a Safe Learning Environment (CASLE)
Ecology Action Centre
Environmental Health Association of Nova Scotia
Learning Disabilities Association of Nova Scotia
Real Alternatives to Toxins in the Environment
Sierra Club of Canada-Atlantic Chapter

Endorsed by:
Breast Cancer Action Nova Scotia
David Suzuki Foundation
Eco-Justice Canada
Canadian Association of Physicians for the Environment
Halifax Field Naturalists
Dr. Robin Walker, Pediatrician
Dr. Roy Fox, Nova Scotia Environmental Health Centre

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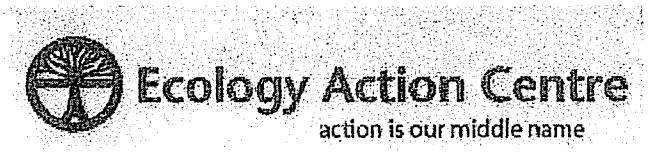
[5] Physiological Responses of Five Seagrass Species to Trace Metals, J.A. Prange and W.C. Dennison, Department of Botany, University of Queensland, Brisbane, Australia and National Research Centre for Environmental Toxicology. 2000.

[6] Conversation with Anda Beach, a North American representative of Neudorff, a major distributor of Fiesta, phone: 250-652-5510.



Re: Adding FeHEDTA aka "Fiesta" to approved pesticides list

June 2, 2010

Dear Halifax Regional Council,

The warning labels attached to the Fiesta product make it clear that it is not benign. Of particular concern are the following warnings:

> Do not re-enter or allow re-entry into treated areas until the spray is dried. Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools, and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature, application equipment, and sprayer settings.

Like other pesticides, the person spraying is not the only person exposed because the product drifts. That means neighbours will be involuntarily, and unwittingly, exposed to a product risky enough that immediately re-entering the spray area is not safe.

Of even greater concern are the unknowns of this new product. The Precautionary Principle dictates that it is prudent to wait until there is conclusive evidence of its safety to environment and health before allowing its use. Meg Sears, an Ottawa-based Chemist and Pesticide Consultant, has this to say about Fiesta:

> The PMRA assessment addresses only the iron-EDTA chemical. [What are the] undisclosed "inactive" ingredients? For example, some vinegar formulations included supposedly inactive chlorophenol...It is not the "acetic acid" part of the name that refers to the really toxic part of 2,4-D. It is the clorophenoxy. My concerns are other ingredients, furthering monoculture turf (our worst invasive species?). I don't know if there is potential for buildup with repeated use and soil toxicity for some other plants.

Daniel Rainham, the Elizabeth May Chair in Sustainability and Environmental Health at Dalhousie, worries about the environmental impacts of this product:

> The active ingredient is Iron. The iron is then chealated with hydroxyethylenediaminetriacetic acid (2,4-D is also an acetic acid!)...I actually don't really see the point of using this at all. It's basically an herbicide that requires lots of the stuff to kill anything, and if anything will likely reduce the diversity of plants in turf, which may inevitably lead to more frequent application.

Reduced diversity in turf also makes lawns more vulnerable to the weeds this product is trying to control. A more ideal solution is sound organic soil management, use of organic compost, and re-introduction of hardy native plant species.

- Sierra Club of Canada-Atlantic Chapter

Endorsed by:
- Breast Cancer Action, Nova Scotia
- David Suzuki Foundation
- Eco-Justice, Canada
- Canadian Association of Physicians for the Environment
- Halifax Field Naturalists
- Dr Robin Walker, Pediatrician
- Dr. Roy Fox, Nova Scotia Environmental Health Centre

Canadian HEMOCHROMATOSIS SOCIETY

Canadian Hemochromatosis Society
#272-7000 Minoru Boulevard
Richmond, B.C., Canada
V6Y 3Z5

March 1, 2011

To Whom It May Concern:

RE: Approval of iron based herbicides (such as FeHEDTA, Fiesta) for use on lawns in Canadian communities

Over exposure to Iron is toxic. Any potential increase in environmental exposure to Iron through inhalation, skin absorption or ingestion following the application of Iron-based landscape products is of grave concern to the Canadian Hemochromatosis Society (www.toomuchiron.ca).

We recommend meeting your landscape maintenance needs through a wide variety of effective, non-toxic safe alternatives that are readily available, such as those described at the following sites.

Natural Insect Control (NIC) Catalogue, (905) 382-2904, RR#2, Stevensville, ON, L0S 1S0
http://www.natural-insect-control.com/
http://www.eartheasy.com/grow_nat_pest_cntrl.htm#a
http://www.organiclawncare101.com/
http://versicolor.ca/lawns

Landscape Diversification
http://versicolor.ca/lawns/secC4.html#subtitle5
http://www.oisat.org/controlmap.htm Encyclopedic collection of non-toxic methods on handling crop/insect problems all over the world (including Canada) posted by the Pesticide Action Network (PAN) in Germany; includes homemade plant mixture remedies.

http://www.thebestcontrol.com/bugstop/control_alternatives_favorite.htm

This would be an excellent preventative health measure.

Thank you,

Robert (Bob) Rogers
Executive Director
Chief Executive Officer

From the desk of the Executive Director And Chief Executive Officer of the Canadian Hemochromatosis Society
Phone: 604-279-7136 (Direct) Toll Free: 1-877-BAD-IRON Fax: 604-279-7138
Email: brogers@toomuchiron.ca www.toomuchiron.ca

Canadian Cancer Society
Société canadienne du cancer

NOVA SCOTIA DIVISION

5826 South Street, #1
Halifax, Nova Scotia
B3H 1S6
Telephone: (902) 423-6183
Toll Free: 1-800-639-0222
Fax: (902) 429-6563
www.cancer.ca
ccs.ns@ns.cancer.ca

Cancer Information Service
1-888-939-3333

March 1, 2011

Councillor Peter Lund, Chair
HRM Environment & Sustainability Standing Committee
P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5

Dear Councillor Lund,

The Canadian Cancer Society is very concerned with the potential change to Halifax Regional Municipality's anti-pesticide By-Law, P-800. Our position is based on the current body of evidence that shows the clear connection between pesticides and cancer. The Canadian Cancer Society's goal is to eradicate cancer and reduce the public's exposure to proven cancer causing agents.

We are acutely aware the HRM Environment & Sustainability Standing Committee is being lobbied by companies who wish to see a softening of the pesticide By-Law, P-800. This progressive By-Law has not only made Halifax Regional Municipality a healthier place for the constituents you were elected to serve, but this by-law made our capital a shining example to the rest of Canada.

In assessing the safety of a pesticide, it is important to also consider non-active, or inert, ingredients. FeHEDTA , or Fiesta, contains at least two other ingredients of potential concern. The hazardous materials, according to the Material Safety Data Sheet, are sodium nitrate and Nitrilotriacetic acid, or NTA.

The MSDS for NTA also warns of potential carcinogenic effects, and that *"...the substance may be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organ damage."* The fact remains that according to the MSDS for Fiesta, there is much information that is unknown. This is worrisome to the Canadian Cancer Society as there are a number of carcinogenetic effects from this chemical that require further research. Until the health hazards regarding this chemical can be fully understood, it is our position that it must not be allowed for usage as a cosmetic pesticide for weed control.

I urge this committee to maintain By-Law P-800 as-is, without any amendments. It has proven to be an effective By-Law and one that all Haligonians can take pride in. The new provincial law is complementary to the HRM By-Law, and together they strengthen protection against toxic pesticides and reduce pesticide use. We need to keep our pesticide By-Law and the protections it provides.

Thank you for allowing us to have a voice in this important debate that affects the health of all HRM citizens.

Sincerely,

Maureen Summers
Chief Executive Officer

cc: Krista Tidwell, HRM Clerk's Office
Chris Benjamin, Pesticide Free Nova Scotia

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EMPA
Materials Science & Technology

Dr. A. Prokop
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Deutschland

January 31, 2011

Statement about comparison of EDTA and HEDTA

FeEDTA and FeHEDTA have very similar chemical structures and therefore are expected to have similar degradation routes under environmental conditions. Fe chelates, including FeEDTA and FeHEDTA, can degrade in the environment. The primary route of degradation is photolysis (degradation by sunlight). Complexation with metals (mainly iron) is important for the photodegradation process to occur.

Under aerobic conditions, it is also possible for iron chelates to be subject to microbial degradation.

Sincerely

Bernd Nowack

B. Nowack

Credentials - Dr. Bernd Nowack

Dr. Nowack is one of the world's leading experts in the highly specialized field of the chemistry of metal-chelate complexes. Dr. Nowack earned his doctorate at the ETH Zurich on the subject of chemical complexing agents and has been working since 2006 at EMPA – Material Science & Technology in St. Gallen, Switzerland. He has published over 35 articles on the reaction of chelating agents, in particular EDTA, in international journals. Six of his publications directly address the reaction between EDTA and iron. He is also the author of the book "Biogeochemistry of Chelating Agents", published by the American Chemical Society (2005).

Eco-Care Technologies Inc.

Mar. 14, 2011

To whom it may concern:

I am the Research Director of Eco-Care Technologies Inc., a Canadian R&D company. Our President and CEO, Dr. George Puritch, founded Eco-Care in 1991 and previously co-founded Safer Inc. (the first company to commercialize insecticidal soap). Eco-Care develops low toxicity, environmentally-friendly pesticides and we are world leaders in this area. Our products are not marketed by us but instead are marketed by various companies around the world. Initially, demand for our products was highest in Europe, where the general public's concern for the environment was several years ahead of North America. Our R&D work focusing on safe alternatives to conventional pesticides began long before it was trendy, there was a demand for products in North America or any cosmetic pesticide bans existed.

We have invented many of the low toxicity products in the marketplace today. Our products include: insecticidal soap, herbicidal soap, pyrethrins insecticides (without the synthetic synergist PBO) and vegetable oil insecticides. We also invented iron phosphate slug and snail baits, the first effective alternative to metaldehyde slug baits to be developed in more than 50 years. Many of our products also have organic certifications. Our inventions have allowed the replacement of many toxic conventional pesticides such as metaldehyde, synthetic pyrethroids, chlorpyrifos and 2,4-D in both consumer and ComAg markets in various countries.

After many years of research, we developed a low toxicity, selective lawn herbicide based on FeHEDTA (now marketed in Canada by Scotts as Weed-B-Gon and by Neudorff as Fiesta). FeHEDTA, or chelated iron, is a common iron fertilizer similar to FeEDTA and has been used worldwide for many decades without any adverse effects. FeHEDTA was accepted for review by the Biopesticide Division (BPPD) of the U.S. EPA and through the low-risk stream of the PMRA in Canada. Fiesta was required to meet strict criteria to be considered for review through these regulatory divisions, including a long history of safe use without toxicological concern, low toxicity to non-target organisms and non-persistence in the environment. As part of regulatory requirements, independent studies were conducted on a range of non-target organisms, including fish, aquatic invertebrates, honeybees, birds and mammals. All results further demonstrated the low toxicity of the product. Based on toxicological evaluations, the product was classified as Toxicity Category IV by the EPA (their least toxic category) for acute oral, acute dermal, acute inhalation, eye irritation and dermal irritation. Fiesta was also reviewed and allowed for use in Ontario under the cosmetic pesticide ban and is also allowed for use in Quebec and Nova Scotia. Despite assertions from lobby groups to the contrary, there are no municipalities in Canada where FeHEDTA has been banned.

Inert ingredients added to pesticide formulations are proprietary. Lobby groups sometimes imply that a product is toxic based on its unknown inert ingredients. As the inventors of Fiesta, we can confirm that all of the inert ingredients in the product are EPA List 4 inerts. List 4 inerts are compounds in the lowest toxicity EPA category and are allowed for use in organic formulations (including NOP and OMRI certified products). In addition, all of the toxicology tests (discussed above), which confirmed the low toxicity of the product, were conducted with the end-use product (which includes the inert ingredients).

FeHEDTA is highly selective, even within the Plant Kingdom. FeHEDTA controls weeds without killing grass. This selectivity is based on fundamental differences in how iron is taken up and assimilated in dicots (e.g. weeds) versus monocots (e.g. grasses).

Our product labels for Fiesta contain recommendations to wait until the product dries before people and pets enter a treated area. This language should not be interpreted as an indication of any concern relating to toxicology, as was presented by a lobby group. It is important to note that when the product was initially submitted to regulatory authorities, Eco-Care as the researchers recommended the placement of this warning on the label to avoid staining on clothes. FeHEDTA has a dark colour and it is possible for staining to occur if a consumer/pet were to sit on treated grass before it dries. This warning language (waiting for product to dry) is also a common minimal requirement on labels. The label recommendation for consumers to wait until the product dries is actually a significant improvement compared to many other pesticides, including the selective lawn herbicide 2,4-D, where consumers are required to keep off treated areas for several days (based on toxicology concerns). There is also no REI (Restricted Entry Interval) for the product.

FeHEDTA is not persistent in the environment. Iron chelates, such as FeHEDTA, are susceptible to degradation, with photolysis (UV degradation) being the primary mode of degradation. The presence of metal (e.g. iron) is important in this process, making iron chelates more susceptible to breakdown than standard chelators. Numerous scientific papers document the breakdown of iron chelates. Iron chelates are also susceptible to biodegradation (microbial degradation) under aerobic conditions. UV and microbial degradation also occur in aqueous environments. In simple terms, FeHEDTA is degraded by natural sunlight and soil microbes.

It is important for homeowners and lawn care operators to have effective, low toxicity, environmentally-friendly pesticides, including weed control products, available to them for combating pests. In efforts to avoid pesticides or in the absence of pesticides, people often resort to home remedies to control pest problems. For example, both vinegar and table salt are sometimes used by homeowners to combat weeds; FeHEDTA is even less toxic (i.e. higher LD50, a commonly used measurement of toxicity) than these compounds. Without safe options, it's also possible that homeowners could use even more toxic compounds for combating weeds (e.g. control measures outlined on the internet) such as high concentrations of gasoline, bleach and ammonia.

FeHEDTA is a low toxicity, environmentally-friendly product that offers an effective 2,4-D replacement. Eco-Care Technologies is proud to be the inventors behind this Canadian success story. Fiesta has been embraced by regulatory authorities and jurisdictions in North America. We are hopeful that the city of Halifax will not be swayed by well-meaning lobby groups who are lacking the information needed to correctly evaluate this product. As the researchers and inventors of this product, we are knowledgeable about all of the details relating to this low toxicity product and confidently stand behind it. As homeowners, parents and pet owners ourselves, we are also happy to have such a safe, effective product for use in our own yards.

Sincerely,

Diana Parker
Research Director

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diana@ecocare.bc.ca

Nova Scotia Agricultural College

NSAC. Embrace Your World.

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Dept. of Environmental Sciences
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e-mail: nboyd@nsac.ca

March 2011,

HRM Environment and Sustainability Committee,

A healthy turf is an important part of the urban ecosystem. It forms a pleasant, uniform cover that is capable of enduring reasonable levels of traffic. Grass covered areas enhance aesthetic appeal and alter the microclimate in a positive manner. When you walk across a paved parking lot and onto a grassy area on a hot summer day you can detect the extent that turf modifies a microclimate. The inclusion of other plant species, plant communities, and especially native plants into the landscape provides a myriad of benefits and should be encouraged. Their inclusion, though important, does not function in the same manner and cannot replace turf in the urban ecosystem. Turf will always play an important role due to its visual appeal, ease of maintenance, and ability to provide a living cover capable of surviving disturbance associated with human activities as we work and play.

Like all plant communities, turf is susceptible to weed invasion. The presence of weeds does increase plant diversity but one should not assume that all forms of diversity are positive. The most common weed species of turf are a concern because they are non-native, alter turf aesthetics, impact sporting activities, compete with turf species, spread into perennial beds, and can spread into natural areas impacting native diversity. Management of weeds in turf is best achieved with the adoption of integrated weed management (IWM) which is the integration of biological knowledge with biological, chemical, and cultural management techniques to reduce weed populations to acceptable levels. Cultural techniques such as the use of appropriate mowing heights, soil amendments, and selection of appropriate cultivars reduces the probability of weed occurrence but will not eliminate all weeds. The use of plant control products to eliminate undesirable plants combined with cultural techniques to reduce probability of weed occurrence is the most effective way to manage weed issues in turf.

The recent pesticide ban in Nova Scotia and HRM reduced the number of available plant control products available for weed management in turf and provided incentive for horticulturalists to look for alternative plant control products that are both effective and safe to use with minimal environmental impact. Fiesta and Weed-B-Gon, are selective plant control products that fits this description. The active ingredient is chelated iron (FeHEDTA). Iron is a common compound that occurs naturally in the environment and is an important plant micronutrient. Chelation describes the process when an inorganic nutrient (iron) is enclosed by an organic molecule (HEDTA) to enhance plant uptake via roots or leaves. Once in the plant, iron functions as a catalyst for oxygen reduction that can produce unstable hydroxyl radicals that cause cellular damage and plant death. FeHEDTA is already widely adopted for use as a micronutrient fertilizer to address iron deficiencies in a range of crops.

Chelated iron was evaluated as a plant control product by the Pesticide Management Regulatory Agency (PMRA) in Canada and the Environmental Protection Agency (EPA) in the United States. The PMRA is responsible for the evaluation and registration of all pesticides registered for use in Canada. In April 2010, the PMRA approved registration of chelated iron for use as an herbicide under the low risk evaluation stream. They concluded that the product, '...does not present an unacceptable risk to human health or the environment'. Acceptable risk is defined as reasonable certainty that no harm to

human health, future generations, or the environment will result from use or exposure to the product. They also concluded that there is negligible risk to honey bees and minimal risk to birds and mammals. The EPA also stated, 'no unreasonable adverse effects to the U.S. population and the environment will results from the use of the active ingredient when label instructions are followed and good agricultural practices are employed". They anticipated that there would be no adverse impacts on mammals, birds, fish, aquatic invertebrates, other non-target insects or plants.

It is important to note that there is risk associated with every activity we undertake. There is risk associated with walking down the street but we go for a walk because we deem the level of risk to be acceptable at least at certain times and in specific areas. The same principle applies to the use of plant control products. There is risk associated with the use of all chemicals compounds and the level of risk is determined by the compound, the dose, and the length of exposure. For example, we consume water and nitrates from various sources and also use both chemical compounds to enhance plant growth. However, water and nitrates can be toxic to humans and cause severe environmental damage when applied in excess but are safe at appropriate levels. The same principle applies in regards to the use of chelated iron. Both the PMRA and the EPA have concluded that when utilized as directed there is minimal risk and as such they have approved the use of chelated iron as a plant control product. It is also important to note that the website of the PMRA clearly states that when a product is evaluated for registration all components of a formulation, not just the active ingredient, are evaluated. Any formulation changes made by a company must be approved by PMRA.

In conclusion, FeHEDTA is a common compound that has been used extensively as a micronutrient for many years without any reported negative impacts on human health or the environment. A critical review by Bernd Nowack from the Institute of Terrestrial Ecology states that the rapid photodegredation of Fe(III)EDTA, a compound chemically very similar to FeHEDTA, results in a mean half-life of EDTA in river water of a few hours during the summer and several days in the winter. Most scientific reviews conclude that the rate of breakdown of HEDTA is likely to be similar to EDTA. Due to this rapid degradation, no accumulation in aquatic environments is expected. In addition, the PMRA and the EPA have concluded that chelated iron is essentially non-toxic to birds, freshwater fish, and honeybees. Given the anticipated low use rate and safe environmental profile I conclude that there is no unreasonable risk associated with approved label uses of chelated iron.

Sincerely,

Nathan Boyd, Ph.D.

MTE | GLOBALTOX

TOXICOLOGY REVIEW OF CHELATED IRON

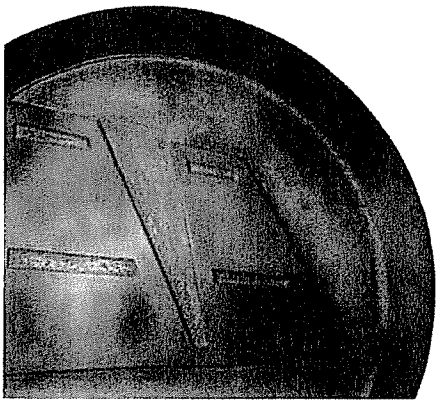
Final

Toxicology Review

Prepared for:
Neudorff North America
PO Box 178
Brentwood Bay, BC
V8M 1R3

March 9, 2011

MTE File No.: 35241-100



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TABLES

EXECUTIVE SUMMARY

The purpose of this report was to complete a literature review and evaluate the toxicity of a herbicide (trade names Fiesta®, Ecosense Weed-be-Gon® - referred to as "Fiesta" or the "product") relevant to human health and the environment. Fiesta is marketed by Neudorff and the active ingredient is chelated iron.

In agricultural industries, iron hydroxyethylenediaminetriacetic acid (FeHEDTA) is widely used as a plant micronutrient fertilizer (HC, 2010). FeHEDTA and other iron chelates (ferric ethylenediaminetetraacetic acid (ferric EDTA)) have been used extensively for many years as liquid fertilizers in soil and for foliar applications to address micronutrient deficiencies in plants (USEPA, 2008).

Health Canada's Pest Management Regulatory Agency (HC 2010) stated that the product does not present an unacceptable risk to human health or the environment under the approved conditions of its use. They concluded that FeHEDTA is of low acute toxicity regardless of the exposure route, but is a potential skin sensitizer. They also noted that applicators, domestic users and bystanders are unlikely to be exposed to levels of FeHEDTA that could result in unacceptable risk if the product is used according to label directions. The acute risk to terrestrial and aquatic organisms was expected to be negligible (HC, 2010).

USEPA (2008) determined that no unreasonable adverse effects to the population or the environment will result from use of FeHEDTA given that label instructions are followed and good agricultural practices are used. USEPA (2008) also noted that laboratory studies involving oral, inhalation and dermal exposures indicated that the active ingredient is not toxic.

Pesticide use of FeHEDTA has become a globally accepted practice. There are currently 13 products registered through the Pest Management Regulatory Agency (PMRA) for use as a herbicide in Canada. Based on the review of the toxicity data for FeHEDTA, the USEPA concluded pesticide products are eligible for registration or reregistration. Australia has approved products with a chemically similar active ingredient. The European Union (EU) has approved "EDTA and its salts" as an acceptable pesticide for use throughout the EU.

Overall, the acute toxicity of FeHEDTA appears to be low. There is evidence to suggest that dermal sensitization may occur under conditions of repeated dermal contact with FeEHDTA. In addition, potential toxicity to birds, amphibians and freshwater mollusks and crustaceans is of low concern if the product is used according to the label directions.

Our opinion is that FeHEDTA is safe for use as a consumer lawn care product for home and garden use when applied according to the label instructions.

1.0 INTRODUCTION

1.1 Overview

The purpose of this report was to complete a literature review and evaluate the toxicity data of a herbicide (trade name Fiesta®, Ecosense Weed-be-Gon® - referred to as "Fiesta" or the "product") relevant to human health and the environment. Fiesta is marketed by Neudorff and the active ingredient is chelated iron.

The toxicology review was focused on information obtained from the Health Canada Proposed Registration Decision for iron hydroxyethylenediaminetriacetic acid (FeHEDTA) (HC, 2010) published by the Pest Management Regulatory Agency (PMRA). Toxicity information was also obtained from the United States Environmental Protection Agency (USEPA) Biopesticides Registration Action Document for FeHEDTA (USEPA, 2008). In addition, a literature search was conducted for studies published 1-year prior to the publication date of HC, 2010.

The regulatory status of chelated iron products specifically used as herbicides, pesticides and natural health products in Canada, the United States and its regulatory classification by various federal and provincial governments was also included in this report.

Based on the evaluation of the available toxicological information, a professional opinion on the safety of the use of chelated iron for the intended use as a herbicide has been provided.

2.0 LITERATURE REVIEW

2.1 History of Use of Chelated Iron as a Fertilizer

In agricultural industries, iron hydroxyethylenediaminetriacetic acid (FeHEDTA) is widely used as a plant micronutrient fertilizer (HC, 2010). FeHEDTA and other iron chelates (ferric ethylenediaminetetraacetic acid (ferric EDTA)) have been used extensively for many years as liquid fertilizers in soil and for foliar applications to address micronutrient deficiencies in plants (USEPA, 2008). According to a report on fertilizer use, the total amount of iron chelate fertilizer consumed in the United States and Puerto Rico in 1996 was 2,372 tons (USEPA, 1999).

Chelated iron fertilizers are applied to soils to help correct iron deficiency in plants. Other chelated iron fertilizers include iron diethylenetriamene pentaacetate (FeDTPA), iron ethylenediamine-N,N'-bis(2-hydroxyphenylacetic acid) (FeEDDHA) and iron EDTA (FeEDTA). The benefit of chelated iron compounds is that they remain available to plants longer than non-chelated iron. Chelated iron fertilizers can be applied at rates of 3 to 5 ounces per 100 ft^2 and can be repeated monthly during the growing season (University of Arizona, 2006).

2.2 Toxicity Data Related to the Active Ingredient (FeHEDTA)

2.2.1 Literature Review Methodology

MTE GlobalTox searched the following databases for relevant information on FeHEDTA:

- Chemical Carcinogenesis Research Information System (CCRIS)
- ChemIDplus
- The Carcinogenic Potency Database (CPDB)

- Integrated Risk Information System (IRIS)
- Toxic Substance Control Act Test Submission Database (TSCATS)
- Genetic Toxicology Data Bank (GENETOX)
- Hazardous Substances Data Bank (HSDB)
- International Uniform Chemical Information Database (IUCLID)
- Registry of Toxic Effects of Chemical Substances (RTECS)
- Toxicology Literature Online (TOXLINE)

MTE GlobalTox also searched published reports and online databases from the following organizations for relevant information on FeHEDTA:

- Agency for Toxic Substances and Disease Registry (ATSDR)
- European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC)
- European Chemicals Bureau (ECB)
- Health Canada (HC)
- National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
- National Toxicology Program (NTP)
- Organization for Economic Cooperation and Development (OECD)
- United Stated Environmental Protection Agency (USEPA)
- World Health Organization (WHO)
    - International Agency for Research on Cancer (IARC)
    - International Programme for Chemical Safety (IPCS)

A literature search using TOXLINE and PubMed was also conducted. The literature search was limited by date and focused on information published since February, 2009 which is 1-year prior to the publication date of the Health Canada Proposed Registration Decision for FeHEDTA published by the PMRA (HC, 2010). The search terms used in the literature searched included "17084-02-5", "iron HEDTA" and "chelated iron".

Data Gathering Summary Sheet

CAS #: 17084-02-5
Chemical Name: FeHEDTA

TABLE 1: SUMMARY OF AVAILABLE DATA

Data Source	Date Searched	Available Data (Y, N) and Comments
ATSDR	4-Feb-11	N – Information is prior to 2009
ECETOC JACC REPORTS	4-Feb-11	N – No relevant information identified (No JACC Report).
ECB	4-Feb-11	N – No information identified.
Health Canada - Drinking Water	4-Feb-11	N – Information is prior to 2009 [Maximum Acceptable Concentration (MAC) available for iron in drinking water (≤0.3 mg/L).
Health Canada - PSL reports	4-Feb-11	N – PSL Assessments not available for FeHEDTA.

Data Source	Date Searched	Available Data (Y, N) and Comments
IARC	4-Feb-11	N – No information identified.
IPCS - CICADS	4-Feb-11	N – No information identified.
IPCS - EHC	4-Feb-11	N – No information identified.
IPCS - JECFA	4-Feb-11	N – Information is prior to 2009.
IPCS - JMPR	4-Feb-11	N – No information identified.
NICNAS PEC REPORTS	4-Feb-11	N – Not Assessed by NICNAS; No PEC Report.
NTP	4-Feb-11	N – No information identified.
OECD SIDS, SIARS	4-Feb-11	N – No information identified.
US EPA	4-Feb-11	Y – Iron HEDTA Fact Sheet identified.
WHO - Drinking Water	4-Feb-11	N – Information is prior to 2009.
CCRIS	4-Feb-11	N – No information identified.
ChemID	4-Feb-11	N – No toxicity information identified.
CPDB (Carcinogenic Potency Database)	4-Feb-11	N – Information is prior to 2009 (no positive results identified for EDTA, trisodium salt trihydrate).
EPA IRIS	4-Feb-11	N – No information identified.
EPA TSCATS	4-Feb-11	N – No information identified.
GENETOX	4-Feb-11	N – Information is prior to 2009.
HSDB	4-Feb-11	N – No information identified.
IUCLID	4-Feb-11	N – No information identified.
RTECS	4-Feb-11	N – Information is prior to 2009.
TOXLINE / TOXLINE CORE (Pubmed) YEARS: 2009-2010	4-Feb-11	Y – One relevant publication was identified in the TOXLINE database from 2009 to present.
OTHER	4-Feb-11	N – CAS No. 17084-02-5 not found in Pesticide Action Network (PAN) Pesticide Database.

2.3 Literature Review Results

The toxicity studies described in HC (2010) were performed with NEU1173H which is one of the proposed end use products and is similar to the technical product. The substance tested was FeHEDTA (26.52% w/w). HC (2010) noted that testing with NEU1173H which represented all the formulations was considered acceptable.

2.3.1 Toxicity Studies in Humans

Study Design	Dosing Regime	Results	Comments Reference
No information was identified regarding toxicity of FeHEDTA in humans.			

2.3.2 Toxicity Studies in Laboratory Animals

2.3.2.1 Acute Toxicity

Species / Strain / Sex / Number of Animals	Dosing Regime	Results	Comments / Reference
Test Substance: NEU1173H (26.52% w/w FeHEDTA containing 4.43% w/w iron)			
Rat; Wistar; female; 3/group	Single oral exposure via gavage; 5,000 mg/kg bw; 14 day observation	LD_{50} > 5,000 mg/kg bw	Low toxicity (HC, 2010) "Not Acutely Toxic" based on the USEPA Acute Toxicity Rankings (Category 4)
Rat; Wistar; male and female; 5/sex/group	24-hour dermal exposure via topical application; 5,000 mg/kg bw; 14 day observation	LD_{50} > 5,000 mg/kg bw	Low toxicity (HC, 2010) "Not Acutely Toxic" based on the USEPA Acute Toxicity Rankings (Category 4)
Rat; Wistar; male and female; 5/sex/dose	Limit test; 4-hour inhalation exposure via nose-only chamber; 5.43 mg/L; 14 day observation	Slight breathing abnormalities were observed during exposure and discoloured fur was observed following exposure. LC_{50} > 5.43 mg/L	Low toxicity (HC, 2010) "Not Acutely Toxic" based on the USEPA Acute Toxicity Rankings (Category 4)

2.3.2.2 Reproductive and Developmental Toxicity

Species / Strain / Sex / Number of Animals	Dosing Regime	Results	Comments / Reference
No information was identified regarding reproductive and developmental toxicity of FeHEDTA. Note: Adverse effects were observed in developmental studies using rats exposed to a chemically similar substance (i.e. iron sodium EDTA). However, these effects were attributed to secondary effects caused by sequestering of zinc, not direct toxicity of iron sodium EDTA (HC, 2010).			

2.3.2.3 Irritation and Sensitization

Species / Strain / Sex / Number of Animals	Dosing Regime	Results	Comments / Reference
Test Substance: NEU1173H (26.52% w/w FeHEDTA containing 4.43% w/w iron)			
Rabbit; New Zealand White; female; 3	0.1 mL in eye (Draize method); observed at 1, 24, 48 and 72 hours post-instillation	Redness of conjunctiva observed at 1, 24 and 48 hours. Chemosis was also observed at 24 hours. Irritation was completely resolved by 72 hours.	Minimally irritating to eye (HC, 2010) "Mildly irritating" USEPA Toxicity Category IV (USEPA, 2008)*
Rabbit; New Zealand White; female; 3	4-hour dermal exposure; 0.5 mL	No effects observed.	Non-irritating to skin (HC, 2010) "Non-irritating" USEPA Toxicity Category IV (USEPA, 2008)*
Mouse; CBA/Ca01aHsd; female; 5/group	Dermal sensitization local lymph node assay (LLNA); Dermal exposure to 25% and 50% test substance with vehicle; 100% test substance and vehicle control. Note: Vehicle was 3:1 acetone/olive oil	Positive results	Dermal Sensitizer (HC, 2010)

*Although study details were not provided in USEPA (2008), it was assumed that this classification was based on the same study as described in HC (2010).

2.3.2.4 Genotoxicity

Type of Study	Species / Strain / Cell Type and Concentration / Dose	Results	Comments / Reference
No information was identified regarding genotoxicity of FeHEDTA. Note: Evidence of genotoxicity was noted in one study using mouse lymphoma cells exposed to a chemically similar substance (i.e. iron sodium EDTA), however, this was attributed to production of hydroxyl free radicals formed through the Fenton reaction, not from iron sodium EDTA (HC, 2010).			

2.3.3 Acute Toxicity Studies in Non-Target Insects and Mammals

Species / Strain / Sex / Number of Animals	Dosing Regime	Results	Comments / Reference
Test Substance: NEU1173H (26.52% FeHEDTA)			
Bee	Oral exposure	NOEL = 0.0125 mg/bee LD_{50} = 0.08368 mg/bee	Relatively non-toxic (HC, 2010) Non-Toxic[1] (USEPA, 2008)
Bee	Contact exposure (48 hours)	NOEC = 0.100 mg/bee	Relatively non-toxic (HC, 2010) Practically non-toxic (USEPA, 2008)
Bobwhite quail	Oral exposure	NOEL = 132.6 mg/kg bw LD_{50} > 530.4 mg/kg bw	Slightly toxic (HC, 2010)
Bobwhite quail	Oral exposure	LD_{50} > 2,000 mg/kg bw	Practically non-toxic (USEPA, 2008)
Bobwhite quail	Oral (dietary) exposure	NOEL = 307.13 mg/kg bw/day	No toxicity at the highest dose (HC, 2010)
Bobwhite quail	Oral (dietary) exposure	LD_{50} > 5,000 ppm	Practically non-toxic (USEPA, 2008)
Rat (Species, sex and number of animals not reported)	Oral exposure	LD_{50} > 1,326 mg/kg bw	No toxicity at the highest dose (HC, 2010)

[1] The US EPA actually reported this result as "Toxic", however, we consider this an error as the USEPA's criterion for bee toxicity after direct exposure is an LD_{50} of 11 micrograms (0.011 mg) or less according to the USEPA's Label Review Manual, 2008.

2.3.4 Toxicity Studies in Aquatic Animals

Species / Strain / Sex / Number of Animals	Test Substance / Dosing Regime	Results	Comments / Reference
Test Substance: NEU1173H (26.52% w/w FeHEDTA containing 4.43% w/w iron)			
Daphnia magna	Acute exposure	NOEC = 27.7 mg/L 48-hour LC_{50} >100 mg/L	No toxicity at the highest concentration (HC, 2010) Practically non-toxic (USEPA, 2008)
Rainbow trout	Acute exposure	NOEC = 27.7 mg/L 96-hour LC_{50} >100 mg/L	No toxicity at the highest concentration (HC, 2010) Practically non-toxic (USEPA, 2008)

2.3.5 Accidental Poisoning Case Reports

Exposure to Iron EDTA (was likely ferric sodium EDTA; CASRN 15708-41-5 used in snail bait products)			
Dog (5 cases reported)	Accidental exposure to 150,000- 650,000 mg of product (in snail bait pellets); (equivalent to 6,000 mg/kg product or 728 mg/kg iron to 24,000 mg/kg product or 3,130 mg/kg iron).	Acute onset of abdominal pain and hemorrhagic diarrhea was reported 6 hours after ingestion. The dogs sometimes became mildly tachycardic with elevated heart rate and body temperature. Following treatment (including an iron chelator), all dogs recovered full and were released 48 – 72 hours later.	Haldane and Davis, 2009

3.0 REGULATORY STATUS

3.1 Pesticide Use Regulatory Review

A review of the global regulations guiding the use of FeHEDTA has been conducted in order to assess its regional acceptance. An initial search was conducted of Canadian federal and provincial pest control product regulations in order to determine the current opinion on the effects of FeHEDTA on the Canadian population and environment. Legislation and guidelines regarding FeHEDTA for each Canadian region were reviewed and summarized.

This search was then expanded to include United States (US) federal pesticide regulations. Finally, current registrations of products containing FeHEDTA in the European Union (EU) and countries that are part of the Organization for Economic Cooperation and Development (OECD) but outside the EU were considered.

TABLE 2: A SUMMARY OF THE GLOBAL REGULATION OF FEHEDTA

Region	FeHEDTA Approval	Regulatory Comments
Canada	Yes	Approved under the federal *Pest Control Products Act* (PCPA) for use in all provinces unless specifically restricted by provincial legislature; Determined to not pose unreasonable risks to human and environmental health
United States	Yes	Determined FeHEDTA is not toxic following oral, dermal or inhalation exposure; Will not cause any harmful environmental effects; Eligible for continued pesticide use
Australia	Yes	4 Molluscicide products contain an active ingredient similar or closely related to FeHEDTA
European Union	Yes	"EDTA and its salts" was registered as an active pesticide ingredient in the EU; No further reports were available to determine if FeHEDTA was included in this registration

3.2 Methodology

Information retrieved for this review was taken from government sources only. The initial search engine used was Google; the initial search terms included "jurisdiction", and "ministry of environment" if required (e.g., "Ontario", then if required, "Ontario Ministry of Environment"). Once at a regional regulators website two approaches were utilized. First, links contained on the site were followed to locate pesticide regulations and guidelines. If site navigation did not yield information, the site's search capability was utilized where available. Within a regulators site, some or all the following search terms were applied as necessary:

Pesticide	Pesticide Regulation	Pest Control
FeHEDTA	Iron	Chelated Iron

3.3 Regulatory Status of FeHEDTA in Canada

The PMRA, a division of Health Canada, oversees the enforcement of the federal *Pest Control Products Act,* (PCPA). Within this directive, the PMRA is responsible for the registration of all pest control products in Canada. In Canada, the use of a product such as FeHEDTA as an herbicide falls under this jurisdiction.

A thorough review of FeHEDTA was conducted by the PMRA in 2010 (HC, 2010). This assessment was based on substantial toxicological data on both human and environmental health. This report concluded there was reasonable certainty that no harm to human health, future generations or the environment would result from the registered uses of FeHEDTA-containing products. In addition to human and environmental health assessments, products approved by the PMRA are also screened for efficacy. Products must function as intended for registration. There are currently 13 products (**Table 3**) registered through the PMRA containing FeHEDTA as an active ingredient. These products are all approved for use as a herbicide in Canada.

TABLE 3: PMRA REGISTERED PRODUCTS CONTAINING FEHEDTA

Product Name	Registration Number	Registered Use	Concentration of FeHEDTA in product (%)
NEU1173H RTU	29533	Herbicide	1.50
NEU1173H	29539	Herbicide	26.52
NEU1173H LARGE SIZE	29538	Herbicide	26.52
NEU1173H READY TO SPRAY	29537	Herbicide	26.52
NEU1173H READY TO SPRAY LARGE SIZE	29536	Herbicide	26.52
FIESTA LAWN WEED KILLER	29535	Herbicide	26.52
FIESTA LAWN WEED KILLER READY TO SPRAY	29534	Herbicide	26.52
NEU1173H RTU WITH QUICK CONNECT SPRAYER	29532	Herbicide	1.50
NEU1173H TGAI	29523	Herbicide	27.00
NEU1173H RTU WITH PULL'N SPRAY APPLICATOR	29531	Herbicide	1.50
SCOTTS® ECOSENSE WEED-B-GON® READY-TO-USE WEED CONTROL WITH QUICK CONNECT SPRAYER	29695	Herbicide	1.50
SCOTTS® ECOSENSE WEED-B-GON® READY-TO-USE WEED CONTROL	29694	Herbicide	1.50
SCOTTS® ECOSENSE WEED B GON® READY-TO-USE WEED CONTROL WITH PULL'N SPRAY® APPLICATOR	29834	Herbicide	1.50

Provincial Regulation of FeHEDTA

Provincial governments are empowered to adopt additional legislation on the use of pesticides. Most provinces enforce a permit system to ensure pesticides are used according to their registered labels. Several provinces also maintain lists of pesticides which are restricted or banned within that province. These regulations are subservient to, and intended to work in conjunction with, the PCPA. Municipalities in Canada may also impose pesticide use restrictions within their boundaries however municipal decisions have not been reviewed for this report.

Table 4 describes any regulations affecting the use of FeHEDTA provincially. In most provinces, FeHEDTA is approved for use as regulated by the PMRA without additional provincial restriction.

TABLE 4: PROVINCIAL REGULATION OF FEHEDTA APPLICATION

Province	Regulatory Status of FeHEDTA	Comments
Alberta	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA
British Columbia	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA
Manitoba	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA
New Brunswick	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA
Newfoundland and Labrador	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA
Northwest Territories	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA
Nova Scotia	Approved	To be permitted as an exemption to the *Non-Essential Pesticides Control Act* as of April 1, 2011
Nunavut	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA
Ontario	Approved	Permitted as an exemption to the cosmetic pesticide ban of April 22, 2009
Prince Edward Island	Approved	FeHEDTA use is not restricted however some FeHEDTA-containing products are banned based on application method
Quebec	Approved	Pesticide information was published in French, and was not reported on in this review
Saskatchewan	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA
Yukon	Approved	No bans or restrictions have been placed on PMRA registered uses of FeHEDTA

Nova Scotia, Ontario and Prince Edward Island

In conjunction with the PCPA, Nova Scotia introduced the *Non-Essential Pesticides Control Act* in 2010. This act prohibited ornamental and lawn treatment uses of pesticides. This act allowed the Minister of the Environment to create a list of pesticides that would remain permissible for these uses under this act. FeHEDTA is included on the *List of Allowable Pesticides Regulations* that will come into force on April 1, 2011. This inclusion will permit the use of FeHEDTA-containing products on lawns and ornamental plants.

Ontario brought a cosmetic pesticide ban into force on April 22, 2009. This ban restricted the use of pesticides on lawns and ornamental plants. A list of products exempted from the ban is published. Five registered pesticide products from **Table 3** containing FeHEDTA are currently permitted for cosmetic uses under the ban. Two of these products are marketed by Neudorff with 4.43% FeHEDTA and the remaining three are marketed by Scotts Canada with a 0.25% concentration of FeHEDTA.

On April 1, 2010 Prince Edward Island (PEI) enacted restrictions on the use of lawn pesticides. Banned products include combination products such as herbicide-fertilizer blends, concentrates requiring dilution before use, hose-end products, granular products and products containing the active ingredient 2,4-dichlorophenoxyacetic acid (2,4-D). A list of approximately 240 banned products was published. No restrictions are placed on FeHEDTA as an active ingredient. Similarily, none of the 13 registered products from **Table 3** are included in the banned products list; however, several of these products may not be permitted for use based on the criteria for banned products (i.e., Registration Number 29532).

3.4 Regulatory Status of FeHEDTA in the United States

In 2008, the USEPA released a *Biopesticides Registration Action Document* on *Iron HEDTA* (USEPA, 2008). The USEPA concluded that no unreasonable adverse effects on the US population or environment is expected provided products were properly used. This decision was based on a review of human and environmental toxicology data required for the registration of a biochemical active ingredient. In addition to product safety, the USEPA concluded FeHEDTA was effective as a biopesticide in registered end use products. The report states that no adverse effects have been reported from the use of FeHEDTA as a pesticide. No information was obtained regarding the concentration of FeHEDTA in products or the application rate.

3.5 Global Regulatory Status of FeHEDTA

The list of registered active ingredients in Australia includes two compounds that may be identical or closely related to FeHEDTA, "Iron EDTA Complex" and "Ferric EDTA." In Australia, three products are currently registered in Australia with "Iron EDTA Complex" and one product with "Ferric EDTA" as the active ingredient. All three products are registered for use as molluscicides and there are no restrictions on the widespread use of the products. No information was obtained regarding the concentration of FeHEDTA in products or the application rate.

Pesticides are regulated by a single agency across the entire EU. Each member country submits applications for new active ingredients and products separately for evaluation to the European Commission. The EU pesticide registration database lists "EDTA and its salts" as approved, Belgium is listed as the registrant country. No report was available to determine

which salts were included in this registration. No information was obtained regarding the concentration of FeHEDTA in products or the application rate.

3.6 Status of FeHEDTA in the Licensed Natural Health Products Database

A search was conducted of the Natural Health Products Ingredients Database for iron compounds. Several search terms were utilized in order to determine if FeHEDTA or a synonym were registered with the Natural Health Products Directorate (NHPD). No registered products contained FeHEDTA or a synonym for this substance. There were 90 ingredients that contained "iron" in the ingredient name or synonyms. The most common forms of iron included in natural health products were ferrous sulphate, ferrous gluconate and ferrous fumarate.

The US does not maintain a database of dietary supplement products that can be reviewed.

3.7 Fertilizer Use

Iron is commonly included in fertilizer mixture products. In Canada, fertilizers are regulated by the Canadian Food Inspection Agency (CFIA). In order to be registered in Canada, fertilizer products undergo pre-market assessment consisting of a review of safety and efficacy data. Safety data includes information on human and environmental toxicity. Chelated Iron is approved in fertilizer products in Canada as a micronutrient fertilizer.

No regulation or database for fertilizers in the US was found. Guidance was provided for certain types of fertilizers but none were relevant to FeHEDTA as a fertilizer. The USEPA acknowledged in the biopesticide review of FeHEDTA that the substance has been utilized to address iron deficiencies in plants. This report states that no adverse effects have been reported from the use of FeHEDTA as a fertilizer.

4.0 OPINION ON THE TOXICITY OF THE ACTIVE INGREDIENT

The majority of toxicological information available for FeHEDTA was obtained from HC (2010) and USEPA (2008). The test substance used in the toxicity tests was NEU1173H (26.52% w/w FeHEDTA containing 4.43% w/w iron). Based on a review of the available information, the toxicity of NEU1173H containing the active ingredient (FeHEDTA) appears to be low.

In acute exposure studies involving rats, both oral and dermal LD_{50} values were >5,000 mg/kg and the inhalation LC_{50} was >5.43 mg/L. Based on these values, the product was described as having "low toxicity" by HC (2010) and "Practically non-toxic" based on the USEPA Acute Toxicity Rankings (Category 4).

In acute irritation studies, minimal eye irritation and no skin irritation was observed in rabbits (HC, 2010; USEPA, 2008). The product was classified by the USEPA as Toxicity Category IV for both acute eye and acute dermal irritation (USEPA, 2008). USEPA (2010) also noted that FeHEDTA was not a dermal sensitizer. However, a dermal sensitization local lymph node assay reported in HC (2010) showed positive results and HC (2010) noted that there is potential for skin sensitization to occur after repeated skin exposure with FeHEDTA products.

Based on an oral LD_{50} for acute exposure in honey bees, the product was described as "Relatively non-toxic" by HC (2010). The test result would also meet the USEPA's criteria of "non-toxic" according to the EPA's Label Review Manual. HC (2010) conducted an assessment

for honey bees and determined the risk to honey bees was negligible. Regarding contact toxicity in honey bees, the product was described as being "Relatively non-toxic" and "Practically non-toxic" in HC (2010) and USEPA (2008), respectively.

Avian toxicity studies were also conducted on the Bobwhite quail. No evidence of toxicity was observed in dietary studies. In acute toxicity studies, the product was described as being "Practically non-toxic" by USEPA (2008). HC (2010) described the product as "Slightly toxic" and reported a NOEL of 132.6 mg/kg bw and an LD_{50} of >530.4 mg/kg bw. HC (2010) also conducted an assessment on birds. Although risk quotients exceeded one in some scenarios (indicating possible need for a more refined risk assessment), HC (2010) determined the risks to birds were minimal based on limited exposure expected from use on turf involving localized treatment using standard or backpack sprayers. The same conclusion was also made for small mammals based on an LD_{50} of >1,326 mg/kg bw in rats.

One study also identified several instances of accidental ingestion of snail bait pellets by dogs containing iron EDTA. It is possible that the iron EDTA in the snail bait pellets was in the form of sodium iron EDTA, and was not the same as the test substance used in the toxicity studies in HC (2010) and USEPA (2008). The dogs ingested varying amounts of product (ranging from 150 to 650 g) and showed symptoms including vomiting, diarrhea and abdominal pain. The symptoms usually disappeared after a few days of chelation treatment. Exposure to this amount of product is not likely given the intended use of the product.

No evidence of toxicity was observed in aquatic toxicity studies in *Daphnia magna* or rainbow trout (NOECs were equal to 27.7 mg/L and LC_{50}s were >100 mg/L) (HC, 2010).

HC (2010) indicated that FeHEDTA could potentially be toxic to amphibians and freshwater molluscs and crustaceans, however, exposure would be unlikely to occur given that FeHEDTA is intended to be used directly on broadleaf target plants.

HC (2010) stated that the product does not present an unacceptable risk to human health or the environment under the approved conditions of its use. It was concluded that FeHEDTA is of low acute toxicity regardless of the exposure route, but is a potential skin sensitizer. HC (2010) also noted that applicators, domestic users and bystanders are unlikely to be exposed to levels of FeHEDTA that could result in unacceptable risk if the product is used according to label directions. The acute risk to terrestrial and aquatic organisms was expected to be negligible (HC, 2010).

USEPA (2008) determined that no unreasonable adverse effects to the population or the environment will result from use of FeHEDTA given that label instructions are followed and good agricultural practices are used. USEPA (2008) also noted that laboratory studies involving oral, inhalation and dermal exposures indicated that the active ingredient is not toxic.

Overall, the acute toxicity of FeHEDTA appears to be low. There is evidence to suggest that dermal sensitization may occur under conditions of repeated dermal contact with FeEHDTA. In addition, potential toxicity to birds, amphibians and freshwater molluscs and crustaceans is of low concern if the product is used according to the label directions.

5.0 UNCERTAINTY ASSESSMENT

Some data gaps were identified based on the information in HC (2010) and USEPA (2008). These included:

- No human studies were available for FeHEDTA;
- No studies regarding reproductive or developmental toxicity were available for FeHEDTA; and
- No studies regarding genotoxicity were available for FeHEDTA.

However, some studies were available from chemically similar substances (e.g. iron sodium EDTA). Although adverse effects were observed in developmental studies using rats, these effects were attributed to secondary effects caused by sequestering of zinc, not direct toxicity of iron sodium EDTA. Evidence of genotoxicity was noted in one study using mouse lymphoma cells, however, this was attributed to production of hydroxyl free radicals formed through the Fenton reaction, not from iron sodium EDTA (HC, 2010).

6.0 DISCLAIMER AND LIMITATIONS

This report was prepared by MTE GlobalTox solely for the account of Neudorff. The material documented herein reflects MTE GlobalTox's best judgment in light of the information available to MTE GlobalTox at the time of preparation. Any use which a third party makes of this report, or any reliance on, or decisions made, by third parties based on this report are the responsibilities of such third parties. MTE GlobalTox accepts no responsibility for damages, if any, suffered by any third parties as a result of decisions made, or actions taken, based on this report.

7.0 OPINION

Our opinion is that FeHEDTA is safe for use as a consumer lawn care product for home and garden use when applied according to the label instructions.

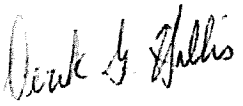
8.0 CLOSURE

This report completes MTE GlobalTox's scope of work. Please do not hesitate to contact the undersigned should you have any questions or concerns.

All of which is respectfully submitted,

MTE GlobalTox

Mark Goldberg, Ph.D., D.A.B.T., C.Dir.
Director, Research and Development



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BIOPESTICIDES REGISTRATION ACTION DOCUMENT

Iron HEDTA

U.S. Environmental Protection Agency
Office of Pesticide Programs
Biopesticides and Pollution Prevention Division

This document is for informational purposes only and is representative of the Agency's justification in registering products containing this active ingredient. This is not a legal document. (Need OGC language)

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BIOPESTICIDES REGISTRATION ACTION DOCUMENT TEAM

Office of Pesticide Programs:

Biopesticides and Pollution Prevention Division

Biochemical Pesticides Branch (BPB)

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Linda Hollis	Branch Chief
Clara Fuentes	Entomologist
Nina Simeonova	Chemist (NOWSEE Contractor)

I. EXECUTIVE SUMMARY:

The active ingredient Iron HEDTA is a deep red, odorless liquid compound. It is intended for use in households (residential) and on lawns, commercial right of ways, golf courses, parks and playgrounds to control weeds, algae and moss using ground equipment.

The Biopesticides and Pollution Prevention Division (BPPD) has reviewed the data required to support the registration of this biochemical active ingredient, under Section 3(c)(5) of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Product chemistry data requirements were satisfied by acceptable guideline studies. Adequate mammalian toxicology data/information was submitted to support registration of Iron HEDTA. Acceptable acute toxicity guideline studies were submitted, and data waivers were granted by the Agency to fulfill the remaining toxicity requirements based on the lack of toxicity of the active ingredient. Ecological effects data requirements for Iron HEDTA were fulfilled by acceptable guideline studies and additional data/information from the scientific literature sufficient to support data waivers for the remaining Tier I and Tier II requirements.

Based on the data available to the Agency, it has been determined that no unreasonable adverse effects to the U.S. population and the environment will result from the use of the active ingredient when label instructions are followed and good agricultural practices are employed. Laboratory studies indicate that the active ingredient is not toxic following oral, inhalation or dermal exposure. Iron HEDTA and other chelates like ferric EDTA have been extensively used as liquid fertilizers in soil and foliar applications for many years to address micronutrient deficiencies in plants. There are no reports of adverse effects following human exposure to Iron HEDTA. Moreover, the pesticidal usage of this biochemical will not have any harmful environmental effects. Studies indicate that Iron HEDTA will not cause adverse effects to mammals, birds, fish and aquatic invertebrates, other non-target insects, or plants.

Efficacy data submitted on the end use product were reviewed and showed support to the claims of product performance on the label.

II. ACTIVE INGREDIENT OVERVIEW

Common Name: Ferric HEDTA

Chemical Names: Iron HEDTA

Trade & Other Names: FeHEDTA

CAS Registry Number: 17084-02-5

OPP Chemical Code: 034702

Type of Pesticide: Herbicide, algaecide and mosscide.

Application rates and methods vary depending on the product. For specific information regarding the product*(s)* refer to Appendix B.

III. REGULATORY BACKGROUND

On August 17, 2007, W. Neudorff GmbH KG, submitted an application for the registration of the end use products (EP) NEU1173H Concentrate herbicide containing 26.52% w/w Iron HEDTA EPA Registration Number 67702-EA, and NEU1173H RTU, containing 1.5 w/w Iron HEDTA EPA Reg. Number 67702-ET. A notice of receipt of the application for registration of Iron HETDA as a new active ingredient was published in the Federal Register on June 25, 2008 (73 FR 36076) with a 30-day comment period. No comments were received following this publication.

A. Classification

On April 02, 2001, the Biochemical Classification Committee determined that Iron HEDTA is not a biochemical pesticide, but is nonetheless eligible for treatment like a biochemical pesticide (see data requirements at 40 CFR Subpart U). Iron HEDTA has no direct lethal effects on the target pest, and appears to operate as oxidative agent on target pests.

B. Food Clearances/Tolerances

Currently, this active ingredient is not registered for use on food or feed commodities, and the applicant has not filled a petition for a tolerance (nor a tolerance exemption) for Iron HEDTA. As a result, a tolerance or exemption from the requirement of a tolerance is not relevant.

IV. RISK ASSESSMENT

A. Active Ingredient Characterization

Iron is a ubiquitous inorganic element in the environment. Iron HEDTA and other similar chelates like Fe EDTA have been applied as liquid fertilizers in soil and foliar applications for many years to address micronutrient deficiencies in plants.

The descriptions of the product formulation and production process, as well as the formation of impurities, were examined by the Agency and found to be acceptable in meeting current guideline standards. A preliminary analysis was conducted to determine Iron HEDTA content in five batches of the product, and the results were determined to be acceptable by the Agency. The analytical method used to determine the content of the active ingredient is also acceptable. Physical and chemical properties were submitted for the active ingredient and are adequate. Refer to Table 1 in Appendix A for a summary of product chemistry data requirements. Refer to Table 2 in Appendix A for the summary of physical and chemical characteristics for Iron HEDTA. All product chemistry data requirements for registration of Iron HEDTA have been **satisfied.**

B. Human Health Assessment

1. Toxicology

Toxicity categories are assigned based on the hazard(s) identified from studies and/or information on file with the Agency. The active ingredient is classified into Toxicity Category I, II, III or IV where Toxicity Category I indicates the highest toxicity and Toxicity Category IV indicates the lowest toxicity.

Adequate mammalian toxicology data/information on the technical grade active ingredient (TGAI) are available to support registration of Iron HEDTA. All toxicology data requirements have been **satisfied.**

a. Acute Toxicity

Acute toxicity testing is required to 1) determine systemic toxicity from acute exposure via the dermal, inhalation and oral routes, 2) determine irritant effects from exposure to the eyes and 3) determine the potential for skin sensitization (allergic contact dermatitis).

The substance used in the toxicity studies was the TGAI/EP containing 26.52% Iron HEDTA. The substance is in Toxicity Category IV for acute oral, acute dermal, acute inhalation toxicity, and eye and dermal irritations. The substance is not a dermal sensitizer. Based on the review and analysis of the guideline studies, no additional toxicity data are required to support non-food uses of this biochemical.

For more information regarding the acute toxicity data requirements, refer to Table 3 in Appendix A.

b. Sub-chronic Toxicity

Sub-chronic data is required to determine a no-observed-effect-level (NOEL) and toxic effects (if any) associated with repeated or continuous exposure to a test substance for a period of 90 days.

The Agency received and accepted the registrant's waiver requests for 90-day Feeding Study (OPPTS 870.3100); 90-Day Dermal Study (OPPTS 870.3250); 90-Day Inhalation Study (OPPTS 870.3465); and Immune Response (OPPTS 880.3550).

The data requirement for 90-day Feeding Study (OPPTS 870.3100) is not applicable because the product will not be used on food commodities, and no repeated sub-chronic oral exposures are expected. Moreover, Tier I acute toxicity studies show toxicity category IV for all routes of exposure.

The waiver rational for a 90-Day Dermal Toxicity Study (OPPTS 870.3250) was accepted because the product is not likely to result in prolonged skin exposure. Furthermore, iron is found abundantly in nature, and has low toxicity because of its low absorption through skin.

The 90-Day Inhalation Toxicity Study (OPPTS 870.3465) waiver request was accepted because the use pattern of the product is not expected result in repeated inhalation exposure at a concentration which is likely to be toxic.

c. Developmental Toxicity and Mutagenicity

Acceptable waiver request was submitted to address the data requirements for Developmental toxicity and Mutagenicity (OPPTS 870.3700). The Agency concluded that human's are regularly exposed to iron found abundantly in nature and from the use of iron cheats as fertilizers. No negative effects of Iron HEDTA have been reported because of its low toxicity, and low water solubility, which would decrease its absorption across the intestine. Moreover, the active ingredient is not a mutagen nor is it related to any known classes of mutagens

e. Effects on the Endocrine System

EPA is required under the Federal Food, Drug, and Cosmetics Act (FFDCA), as amended by the Food Quality Protection Act (FQPA), to develop a screening program to determine whether certain substances (including all pesticide active and other ingredients) "may have an effect in humans that is similar to an effect produced by a naturally-occurring estrogen, or other such endocrine effects as the Administrator may designate." Following the recommendations of its Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC), EPA determined that there was scientific basis for including, as part of the program, the androgen and thyroid hormone systems, in addition to the estrogen hormone system. EPA also adopted EDSTAC's recommendation that the program include evaluations of potential effects in wildlife. For pesticide chemicals, the Agency will use FIFRA and, to the extent that effects in wildlife may help determine whether a substance may have an effect in humans, FFDCA authority to require the wildlife evaluations. As the science develops and resources allow, screening of additional hormone systems may be added to the Endocrine Disruptor Screening Program (EDSP).

The Agency is not requiring information on the endocrine effects of Iron HEDTA at this time. The Agency has considered, among other relevant factors, available information concerning whether the active ingredient may have an effect on humans similar to an effect produced by naturally-occurring estrogen or other endocrine effects. There is no known metabolite that acts as an endocrine disrupter produced by this active ingredient. Based on the low potential exposure level associated with the proposed use, the Agency expects no incremental adverse effects to the endocrine or immune systems.

2. Dose Response Assessment

No toxicological endpoints were identified; therefore, a dose response assessment was not required.

3. Drinking Water Exposure and Risk Characterization

No significant drinking water exposure is expected from accumulation of Iron HEDTA in the aquatic environment when products containing the active ingredient are used according to label directions. Moreover, Iron HEDTA degrades readily in the environment.

4. Occupational, Residential, School and Day Care Exposure and Risk Characterization

a. Occupational Exposure and Risk Characterization

The potential for dermal, eye, and inhalation exposure to Iron HEDTA for handlers and applicators is mitigated as long as products are used according to label directions. The Agency will require labels to include the appropriate signal word and precautionary statements, including the requirement for personal protective equipment, to mitigate any risk of exposure.

b. Residential, School and Day Care Exposure and Risk Characterization

No indoor residential, school, or day care uses are currently approved for products containing Iron HEDTA.

5. Risk Characterization

The Agency considered human exposure to Iron HEDTA in light of the relevant safety factors in FQPA and FIFRA. A determination has been made that no unreasonable adverse effects to the U.S. population in general, and to infants and children in particular, will result from the use of Iron HEDTA when label instructions are followed.

C. ENVIRONMENTAL ASSESSMENT

1. Ecological Hazards

Adequate non-target toxicology data/information are available to support registration of Iron HEDTA. All non-target toxicology data requirements for Iron HEDTA have been **satisfied.**

Iron HEDTA and other similar chelates have been applied as liquid fertilizers in soil and foliar applications for many years to address the micronutrient deficiencies in plants. No reports of negatives effects have been documented for the use of these chelates.

According to an avian acute oral toxicity study, Iron HEDTA is considered to be practically non-toxic to birds via the oral route of exposure (LD_{50} >2000). Iron HEDTA is considered to be practically non-toxic to freshwater fish based on a freshwater fish toxicity study (96-hour LC_{50} >100 mg/L). It is also no-toxic to freshwater invertebrate (48-hour LC_{50} > 100 mg/L).
Non-target insect studies submitted showed that Iron HEDTA has no toxic effect on honey bee (Oral 83.7 µg a.i /bee; Contact: 48 hr > 10 µg a.i. /bee).

For more information regarding the non-target toxicity data requirements, refer to Table 4 in Appendix A.

2. Environmental Fate and Ground Water Data

Iron HEDTA is chemically similar to ferric EDTA and thus the two chelates follow the same pathways of degradation, photodegradation and microbial degradation in waste water, sediments and soils. According to Sykora et al. (2001) biological degradation of ethylenediamine-based complexing agents decreases in order of the following substitutes: $-COOH_3$, $-CH_3$, $-C_2H_5$, $-CH_2CH_2OH$ and $-CH_2COOH$ suggesting that HEDTA may be more susceptible to degradation than EDTA. Ferric complexes of EDTA, HEDTA and DTPA are decomposed on exposure to daylight (Hill-Cottingham, 1995). The half-life of ferric EDTA is calculated between 11.3 min to more than 100 h for surface waters containing Fe(III)EDTA (Frank and Rau, 1989; Kari et al, 1995; Svenson et al., 1989). The differences observed in the half-life rates are likely due to differences in light conditions of the experiments. The wavelength of light that is required to photodegrade Fe(III)EDTA is the fraction of sunlight below 400 nm (i.e. in the UV range) (Bucheli-Witschel and Egli, 2001). The rate of photodegradation is also dependent on pH but at measured pH 4 and 8, Fe(III)EDTA was completely degraded in 24 and 32 hours (Lockhart, 1975). Ferric EDTA degrades to ED3A, EDDA-N,N', EDDA-N,N, EDMA, IMDA, glycine and formaldehyde all of which are biodegradable (Metsarinne, 2001). Microbial degradation of ferric EDTA has been documented in numerous studies. In a mixed culture of microorganisms (genus *Methylobacterium, Variovarax, Enterobacter, Aureobacterium* and *Bacillus*) 60% of Fe(III)EDTA was degraded (Bucheli-Witschel, 2001). Ninety percent degradation of ferric EDTA was achieved with a pure culture of *Agrobacterium* sp. (Lauff, 1990). Ferric EDTA was microbially degraded in naturally occurring soils and sediments (Tiedje, 1975 and 1977). Likewise, ferric EDTA was degraded in mixed microbial populations collected from an aerated lagoon (Belly, 1974).

3. Ecological Exposure and Risk Characterization

The potential for exposure to non-target wildlife is minimal. Based on the results/information presented in the Environmental Fate and Groundwater Data section above, it is highly unlikely that non-target organisms, particularly aquatic organisms, would be exposed to potentially toxic levels of Iron HEDTA via runoff and/or movement through the soil. Iron HEDTA undergoes rapid biodegradation in soil and water, and no unreasonable adverse effects to the environment are expected from the use of Iron HEDTA when label instructions are followed.

4. Endangered Species Assessment

Due to chemical similarity between Iron HEDTA and Ferric EDTA, the biological effects of these chelates are comparable. Available information on the effects of iron in sodium ferric EDTA on non-target organisms indicates that the iron in these chelates interacts with the hemocyanin in the bloodstream of molluscs and crustaceans, and it would be toxic to mollusks and crustaceans. However, exposure to freshwater crustaceans or mollusks is unlikely to occur given the intended use of this product as herbicide applied directly to terrestrial plants.

Exposure to endangered or threatened terrestrial snails and crustaceans (isopods) is not expected since the currently listed endangered or threatened species pursuant to the Endangered Species

Act of 1973, 16 U.S.C. 1531, et seq., are not found in locations where the product is intended for use; i.e., home lawns, rights-of-ways, golf courses, parks, playgrounds, cemeteries, and athletic fields. The habitats of currently listed as threatened or endangered mollusks and crustacean species range from isolated caves and streams to woods or forests.

D. PRODUCT PERFORMANCE DATA (EFFICACY)

Submission of product performance data (OPPTS 810.3000) is listed as a requirement for all pesticide products. Customarily, the Agency requires efficacy data to be submitted for review only in connection with the registration of products directly pertaining to the mitigation of disease bearing human health organisms and certain designated quarantine pests, i.e., ticks, mosquitoes, fleas, Mediterranean fruit flies, gypsy moths, Japanese beetles, etc. For a list of organisms considered by the Agency as "public health pests", please refer to Pesticide Registration Notice 2002-1 (http://www.epa.gov/PR_Notices/pr2002-1.pdf).

A series of greenhouse and field trials were conducted to evaluate the efficacy of NEU1173H (a.i., 26.52% w/w Iron HEDTA) against a variety of weeds including dandelion, white clover, English daisy, creeping buttercup, black medick, chickweed, and moss. When applied at the label-recommended rate, the test material was effective against the tested weeds, and its efficacy increased when a second application was made 14 to 28 days after the first one. Lower application rates were less effective. Phytotoxicity to various grasses was normally minimal, and in the few tests where up to 20% of grass was affected, recovery was complete by the end of the test period."
EPA calculates the application rate used in Test 1 (430 mL/m^2, calculated to be 460 al/A) slightly exceeds the label recommended rate (5-10 gal/1000 ft^2, calculated to be 218 – 436 gal/A) for the handheld sprayer used in the test. The application rates in Tests 2 – 17 (200 or 400 mL/m^2) are slightly below the recommended rate. In Tests 18 and 19, the reviewer calculates the application rates of 8.9, 17.7, and 26.6 mL/m^2 to be 9.5, 18.9, and 28.4 gal/A, respectively. The 18.9 gal/A rate slightly exceeds, and the 28.4 gal/A rate greatly exceeds, the label recommended rate of 1 gal/2500 ft^2 (calculated to be 17 gal/A) for the hose-end sprayers used in the test. Therefore the results for the 26.6 mL/m^2 rate should be discounted. When used at the recommended application rate, the test material was effective against a variety of weeds, and its efficacy increased when a second application was made (Tests 1, 2, 5, 12, and 19). The product label recommends a second application after three to four weeks. The second application in Tests 1, 2, and 5 was made after two weeks, and in Tests 12 and 19 after about four weeks. Phytotoxicity to grasses was normally minimal (<5%), although it reached 20% in one test. However, by the end of the test the grass had recovered. The application rates and re-application times do not coincide with those recommended on the label. In most cases, the study demonstrates the performance of the product

V. Risk Management Decision

A. Determination of Eligibility for Registration

Section 3(c)(5) of FIFRA provides for the registration of new active ingredients if it is determined that (A) its composition is such as to warrant the proposed claims for it; (B) its labeling and other materials required to be submitted comply with the requirements of FIFRA; (C) it will perform its intended function without unreasonable adverse effects on the

environment; and (D) when used in accordance with widespread and commonly recognized practice it will not generally cause unreasonable adverse effects on the environment.

The four criteria of the Eligibility Determination for Pesticidal Active Ingredients are satisfied by the science assessments supporting products containing Iron HEDTA. Such products are not expected to cause unreasonable adverse effects, and are likely to provide protection as claimed when used according to label instructions. Therefore, Iron HEDTA is eligible for registration for the labeled uses.

B. Regulatory Decision

The data submitted fulfill the requirements of registration for use in households (residential) and on lawns, commercial right of ways, golf courses, parks and playgrounds to control weeds, algae and moss using ground equipment. Refer to Appendix B for product-specific information.

1. Conditional/Unconditional Registration

All data requirements are fulfilled and EPA has determined that unconditional registration of Iron HEDTA is appropriate.

C. Environmental Justice

EPA seeks to achieve environmental justice, the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies. To help address potential environmental justice issues, the Agency seeks information on any groups or segments of the population who, as a result of their location, cultural practices, or other factors, may have atypical, unusually high exposure to Iron HEDTA, compared to the general population. Please comment if you are aware of any sub-populations that may have atypical, unusually high exposure compared to the general population.

VI. ACTIONS REQUIRED BY REGISTRANTS

The Agency evaluated all of the data submitted in connection with the initial registration of Iron HEDTA and determined that these data are sufficient to satisfy current registration data requirements. No additional data are required to be submitted to the Agency at this time. For new uses and/or changes to existing uses, additional data may be required.

Not withstanding the information stated in the previous paragraph, it should be clearly understood that certain, specific, data are required to be reported to the Agency as a requirement for maintaining the Federal registration for a pesticide product. A brief summary of these types of data are listed below.

A. Reporting of Adverse Effects

Reports of all incidents of adverse effects to the environment must be submitted to the Agency under the provisions stated in FIFRA, Section 6(a)(2).

B. Reporting of Hypersensitivity Incidents

Additionally, all incidents of hypersensitivity (including both suspected and confirmed incidents) must be reported to the Agency under the provisions of 40 CFR Part 158.2050(d).

VII. Appendix A. Data Requirements (40 CFR Part 158-Subpart U)

*NOTE: MRID numbers listed in the following tables are representative of supporting data for the original registration of the product containing this active ingredient. Subsequent to this registration, there may be additional MRIDs that support registration of other products containing this active ingredient.

TABLE 1. Product Chemistry Data Requirements for *Active Ingredient* (40 CFR § 158.2030)		
OPPTS Guideline No.	**Study (MRID 475387-01)**	**Results**
830.1550 to 830.1670	Product identity; Manufacturing process; Discussion of formation of unintentional ingredients	Submitted data satisfy the requirements for product identity, manufacturing process, and discussion of formation of impurities.
830.1700	Analysis of samples	Submitted data satisfy the requirements for analysis of samples.
830.1750	Certification of limits	Limits listed in the CSF are adequate / acceptable.
830.1800	Analytical method	Acceptable.

TABLE 2. Physical and Chemical Properties of *Active Ingredient* (40 CFR § 158.2030) MRID 475387-01, 02		
OPPTS Guideline No.	**Property**	**Description of Result**
830.6302	Color	Deep red
830.6303	Physical State	Liquid at room temperature
830.6304	Odor	Odorless
830.6313	Stability to Normal and Elevated Temperatures, Metals and Metal Ions	Not required for EP
830.6315	Flammability	Not applicable. The product does not contain any combustible ingredients
830.6317	Storage Stability	No change in Iron HEDTA content when stored for a month at 50 degree C
830.6319	Miscibility	Not applicable, the product is not to be mixed with petroleum solvents. Miscible with water in all proportions
830.6320	Corrosion Characteristics	No evidence of corrosive effects on HDPE bottles or caps after one month of storage at 50°C.
830.7000	pH	6.50 ± 0.50
830.7050	UV/Visible Light Absorption	Not required for EP.
830.7100	Viscosity	6 cPs at 30 rpm 11.5 cPs at 60 rpm 4 cPs at 30 rpm Measured with spindle LV1 after one minute at 20°C
830.7200	Melting Point/Range	Not applicable, product is a liquid.
830.7220	Boiling Point/Range	Not required for EP
830.7300	Density	Density is 1.29 g/mL at 20°C
830.7520	Particle Size, Fiber Length and Diameter Distribution	Not applicable, product is a liquid.
830.7550 830.7560 830.7570	Partition Coefficient (n-Octanol/Water)	Not required for EP.
830.7840	Water Solubility	Not required for EP.
830.7950	Vapor Pressure	Not required for EP.

Table 3. Human Toxicology Data Requirements for Iron HEDTA (40 CFR § 158.2050)

Study Type/OPPTS Guideline	LD_{50}/LC_{50}/Results	Toxicity Category	MRID
Acute Oral Toxicity/OPPTS 870.1100	> 5000 mg/kg	IV	472074-04
Acute Dermal Toxicity/OPPTS 870.1200	> 5000 mg/kg	IV	472074-05
Acute Inhalation Toxicity/OPPTS 870.1300	> 5.43 mg/L	IV	472074-06
Acute Eye Irritation/OPPTS 870.2400	Mildly irritating	IV	472074-07
Acute Dermal Irritation/OPPTS 870.2500	Non-irritating	IV	472074-08
Skin Sensitization/OPPTS 870.2600	Not skin sensitizer	IV	472074-09

TABLE 4. Non-Target Organism Toxicity Requirements for *active ingredient* (40 CFR § 158.2060)		
Study/OPPTS Guideline No.	**Results (LD_{50}/LC_{50})**	**Toxicity Category/Description**
Avian acute oral toxicity *Colinus virginianus* (850.2100)	>2000 mg/kg bw	Practically non-toxic (MRID 47207410)
Avian dietary toxicity *Colinus virginianus* (850.2200)	> 5000 ppm	Practically non-toxic (MRID 47233001)
Aquatic invertebrate acute toxicity (*Daphnia magna*) (850.1010)	48 hr > 100 mg/L	Practically non-toxic (MRID 47233003)
Freshwater fish LC_{50} (*Oncorhynchus mykiss*) (850.1075)	96 hours > 100 mg / L	Practically non-toxic (MRID 47233002)
Non-target insects Honey bee acute and contact toxicity LD 50 (880.3020)	Oral: 83.7 µg a.i./bee Contact:: 48 hr > 100 µg a.i./bee	Toxic Practically no-toxic (MRID 47233004)

VIII. Appendix B.

For product specific information, please refer to PPLS

IX. Appendix C.

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Include link to Scientific Term Glossary