RECEIVED SEP 2 0 2007

September 18, 2007

Reducing Nutrients
Manitoba Water Stewardship
Water Quality Management Section
Suite 160, 123 Main Street
Winnipeg, MB R3C 1A5

To Whom It May Concern:

I would like to thank you for the opportunity to provide comments on your ministries proposed approaches to reducing nutrient contributions from urban and rural residential sources. I agree with your approach to lawn fertiliczer, and hope that you will keep in close contact with Minnesota as it reviews the effectiveness of its fertilizer law (see http://www.mda.state.mn.us/protecting/waterprotection/phoslaw.htm for a report on the laws effectiveness). Note that for this ban to be effective, retailers will need to be educated so that they can properly council customers on their responsibility to stay within the regulations.

My position on household cleaners is that it would be most effective to commit to a mandatory ban on phosphorus in all cleaning products sold in Manitoba. I feel a mandatory ban would be far more effective than a voluntary ban, which would be unlikely to achieve more than a 50% update, regardless of publicity. Furthermore, a mandatory ban would ensure manufacturers access to the complete Manitoba market, including access to distributors and wholesalers ensuring the best available pricing on products. Any cost increase to consumers would be small, and could easily be offset by a small increase in low income tax credits or other such measures. I think the proposed Vermont law, (SB137 available at http://www.leg.state.vt.us/docs/legdoc.cfm?URL=/docs/2008/bills/intro/S-137.HTM) limiting Phosphorus to no more than trace amounts, would be an excellent model for Manitoba.

A study carried out in 2004 for the Lake Champlain Committee looked into the costs and benefits associated with such a ban in the State of Vermont, and found that a ban on phosphorus in dishwasher detergent would lead to increased costs of just $6 to $11 per year per household with a dishwasher[1]. This equated to cost of $395,000 per metric tonne of phosphorus removed from Lake Champlain, which compared very favorably to other methods of phosphorus removal. The report also noted that the cost of phosphorus free detergents would likely be reduced 5% if they gained access to wholesale distribution, which would be the case if phosphorus containing cleaners were banned from Manitoba. Note that as leaking septic tanks are also a source of phosphorus loading, meaning that a province wide ban would also reduce phosphates entering Lake Winnipeg via this source.

I would also like to recommend that the ban be extended to include commercial cleaners as well. As a minimum, it would be nice to see government agencies, such as hospitals switch to phosphorus free cleaners. Perhaps a study of effectiveness of phosphate free cleaners in a hospital laundry setting would be useful.

Sincerely,

Mark Cohoe

[1] Hanrahan, Laura and Winslow, Michael Jr., Dishwasher Detergents (ADDs) to Lake Champlain (February 2004). Published by the Lake Champlain Committee, www.lakechamplaincommittee.org

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WINNIPEG, MB R3M 0Y4

Armstrong, Nicole (WSD)

From: George Kemp [chief_berensriver@shaw.ca]
Sent: August 26, 2007 4:44 PM
To: +WPG1218 -Water Quality (WSD)
Cc: billtraverse@manitobachiefs.com
Subject: Re: Chief George Kemp submission

On behalf of Lake Winnipeg:

1. Please make the land along the Red and Assiniboine Rivers chemical free for all users stretching back 1 mile from the riverbank; this includes vegetable farmers, home owners, etc. Heavy rains must wash these chemicals directly into the river without diluting it too much.

2. There are reportedly, 8 million pigs on farmers in the south of Manitoba. Cut this population in half over the next five years and then reduce it further over the next ten years to no more than 600,000 pigs. There are 600,000 people in Winnipeg therefore only one pig per person as a balanced approach. Otherwise, legislate the end of the pork industry in Manitoba.

3. Elders at Berens River talk about the "brown line". Fifty years ago the brown line was south of Catfish Creek. Above this line, the water was clear. Today the brown line has moved past Berens River and it is almost at Poplar River. Restore the water quality in Lake Winnipeg by restoring the "brown line" south of Catfish Creek. This is a natural indicator for the lake.

4. Manitoba Hydro keeps water levels artificially high during the summer months and tremendous erosion is occurring all around Lake Winnipeg due to this fact. Remove the Jenpeg dam since it represents a huge plug at the outlet or drain of Lake Winnipeg. Lake Winnipeg no longer has the ability to flush itself out. The Jenpeg dam makes Lake Winnipeg a huge septic tank. As a child growing up on Lake Winnipeg in the 1950's and early 1960's, I played daily on the shores of Lake Winnipeg at Berens River. I see the changes to the lake today when I go home. I am 53 years old now and it is sad. The lake had a natural rhythm of high water and low water; not one constant level. I use to watch muskrats in the spring, sit on the edge of the melting ice and dive down and haul up clams. These clam piles were on the ice and on the shores. This site is gone today because the water levels are high and therefore the marine life that needed the ebb and tide of natural rhythms is gone. The rocks I use to play on and chase crayfish on are always under water now. This marine life has disappeared due to high water levels destroying their habitat. The Jenpeg dam must go. In the fall season, the water would be low due to draining all summer down the Nelson River. Therefore in the fall when the high northwest winds set in, the water did not back up as high and therefore there was little erosion. Now the whole south basin of the lake is being destroyed due to high water and high northwest winds that drive the waters into the south basin and against the east side of Lake Winnipeg making the rivers back up higher than normal. This is traditional knowledge. My knowledge is true vs. what Manitoba states; that they improved Lake Winnipeg and it is more stable; that is not the point and it is evident today with the lake in trouble. A lot of organics are washing from the shores all around Lake Winnipeg. I showed this to Minister of Conservation back in 1997 when I was on a helicopter tour with him up the east side of Lake Winnipeg during the summer. All along the Bloodvein bay, just north of Bloodvein First Nation, erosion was tipping trees and muskeg into the lake. This is still happening every summer. This is no good for the lake. The Jenpeg dam is no good and it was a mistake and it is still a mistake. Please remove it, since it is not needed anyway with wind power available.

5. Use the Jay Treaty, Article I that states people and places on each side of the border should no cause harm to each other. The US and Canada need to enforce this constitutional document to get farmers on both side of the border and towns to cleanup their act.

Thanks.
Chief George Kemp
Berens River First Nation

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10/03/07

Armstrong, Nicole (WSD)

From: Harvey Lavery [THEMAHDI@mts.net]

Sent: August 23, 2007 7:55 AM

To: Michael Moore; Manitoba Eco-Network; +WPG1218 -Water Quality (WSD); Garth Turner; David Chartrand

Subject: Don't put the cart before the horse! The problem we face that is turning Lake Winnipeg into another peat bog is to reverse the cause that is creating the algae. Read this article then call me and I will tell you of the only way this can be achieved!

Norman Harvey Lavery 102 - 925 Chancellor Dr., Winnipeg, Manitoba R3T 2J9Tel./Fax (204) 269-6521 E mail: August 18, 2007

http://themahdi@600-60-6.blogspot.com

Manitoba just circulated an ER user guide asking people not use hospital emergency rooms for other than life-threatening injuries. Rather they ask people to use family doctors or local health clinics as an alternative, but whoever drew up this chart has little knowledge of poverty, its economic causes, effects or its social class geography; and the kindest thing that can be said about the August conference of the premiers and territorial leaders in Moncton N.B. regarding climate change is to say nothing at all but I can't help but wonder why they and others do not realize it is not future carbon emissions we should be concerned with; it is past and present:

C **Did you know that concrete is the second most used construction material on earth and the cement used in its manufacture is the world's third greatest source of carbon dioxide!** What will be the reaction of the world's people to the economic slowdown that will occur when they come to understand, if we are to survive we will have to **stop cutting down trees, stop paving over the Earth,** change our manufacturing and marketing practices, political and social infrastructure; for what is not often considered is that its use is one of the world's greatest environmental destruction agents as its use invariably becomes a 'cover' that prevents the earth from 're-absorbing' the carbon dioxide we produce; **thus it is a principal cause of global warming**; but carbon dioxide is 1.53 times heavier than air and what is released by the burning of fossil fuels will find a 'home' and that home is the waters of our world which will become warmer and the increased evaporation will bring on flooding rains over much of the earth and **the carbon dioxide increase in our atmosphere will also result in added health problems** caused by the organisms that will be brought on by the increased carbon dioxide.

C What will be the reaction of the world's people when they come to understand that to survive, travel will be restricted and **all flights of jet aircraft and rocket launches will have to stop** due to the disappearing atmospheric moisture and increased UV radiation caused by the depletion of the ozone layer, with the resulting economic/financial impact? **Increasing solar radiation as a result of our disappearing atmospheric moisture is melting polar ice and mountain glaciers.** It is increasing evaporation of the earth's carbon dioxide laden waters with a result in flooding rains and **in winter, it will increase both the cold and snow.**

but I suggest, **unless we change and 'cure' the cancer that is destroying our environment and societies**, the earth will **again** turn over (regardless of what the 'experts' say; it turned over about 2500 years ago) an event that **will** happen if we do not eliminate the root cause responsible for what is happening in our world and I suggest, **unless we 'cure' the cancer called capitalism, as of August 19th, we have 37 months before our "End Time!"**

Revelation 6:8

> And I looked, and behold a pale horse: and his name that sat on him was Death, and Hell followed with him. And power was given unto them over the fourth part of the earth, to kill with sword, and with hunger, and with death, and with the beasts of the earth.

The symbolic "Doomsday Clock" has been reset (Jan. 2007) to show five minutes to midnight but people, the scientific community, academics and world politicians are unaware of how prophetic this is, or the reasons why; but if we do not eliminate poverty:

C Poverty is not being able to obtain the services of the medical profession or able to provide health/dental care for your family and **First Aid clinics should be a part of every school!** It is the only way we will be able to provide the soon-to-be-needed health care facilities to meet the ever growing health problems that will be brought on by our changing environment and aging populations! Staffed by experienced nurse practitioners with support personnel that are connected to a central office for consultation, ambulance services and home care where unused and underused space could also be used to provide accommodation for the many in our hospitals who are waiting to get into our nursing homes and children waiting to be placed with foster parents!

C Schools should be open 365 days annually (if schools and libraries were open 24/7, people would have a place to relieve themselves and public defecation and urination would cease to be a problem for cities) to offer sanctuary for all in need (let the old help those troubled and the young help the old) provide homes for single parents who could become caregivers for those in residence while continuing their education and schools could become neighbourhood caretaking centers. This would relieve our overworked emergency departments of the workload from the ever increasing number of non-emergency patient visits, provide better care to the public while reducing our health and social costs.

and the environmental damage that is an "effect" caused by poverty, we are in mankind's "last days" for when the growing food and water shortages

are added to the lack of hope and the fear becoming common throughout the world, the people of the world will explode into an uncontrollable rage:

> C **When** famine rules the land; **when** food production falls due to drought or high temperatures, locusts, to desertification, sunless days or days with high UV radiation, storms with endless rain, or a lack of water and early frosts, **when** taxes increase (Canadians already pay about 50% of what they earn in taxes) but funds for the ever-growing need for social programs, are reduced or not available, **when** banks close, **when** the stock market collapses and people lose the money they have invested on the advice of scoundrels, **what** will happen to you, to your family, to people in your community and your community; for only the people and communities able to provide for their own needs will not suffer.

I am asking for your help! Help in starting a "Crusade" to save a species; mankind!

A "Crusade" of hope which I suggest is the only way we will be able to save Canadians and people throughout the world.

A "Crusade" which will enable us to reverse the damages we have caused to our world. A "Crusade" which will offer hope too all people by providing them with the means to begin to share in the benefits and rewards of this world of ours and this plan is not a fantasy, but a sound, workable, practical and very necessary program that can be accomplished if we work together; **but if we do not change, as I suggested, we have at the most 37 months before we and our families will die**; but during this period, **we will all learn the meaning of the word Hell!**

We each cannot do or change everything but each of us should do nothing that is not right; but it is not right to do nothing but anyone believing one environmental or social problem can be addressed in isolation from the others or that one nation can correct their problems and not be concerned with problems of other nations lacks understanding, for in all things, at all times, a whole is a sum of its parts and if enough parts die so will the whole; but if the whole dies, so do all the parts and the climate changes taking place throughout the world **cannot, will not be solved unless we destroy the cancer** that is destroying our environment and our societies for under capitalism, there is not enough money in the world to correct our environmental problems or undo the social injustices of the past:

> C Why do people not recognize **capitalism is a cancer**; **a disease that creates the parasites of our societies** who function through feudalistic societies that are called democracies, controlled by Oligarchies (groups of world individuals with shared interests) composed of the wealthiest members of our societies (the 'establishment' the thieves called 'royalty,' the land owners/controllers) that values profit above all else and ignorance above knowledge (capitalism and communism are names given by those who rule to hide the fact both are the same feudal system used for over two thousand years to allow greedy people to enslave others for their own gain) **the cancer that is destroying our environment, our economies and our societies** and **if we do not change, we will be destroyed**; so why do we allow this cancer to continue untreated?

We have created the causes/conditions for our own destruction; but it is said that every disaster is also an opportunity and if we seize this opportunity to raise the economic level of the people at the bottom of today's social/economic pyramid, **if we 'cure' the cancer called capitalism and make the world green again**, we improve the conditions for all and fashion better conditions for ourselves; now and in the future for the quality of life and species development is not determined by part of earth's systems, but by all of the earth's systems and the advancement of mankind can only be realized through the strength of our individual ability to reason, with each 'life' furthering their growth through learning.

Consider, a world trading corporation based and controlled in Manitoba, designed to provide the means for people everywhere to begin to help themselves, to become producers. A company that would provide the information, the educational facilities, the tools and land; the start up capital necessary for people to become producers, co-ordinate their production, and help sell their surplus production:

> C The corporation would quickly become the largest trading company in the world by providing opportunities for people in all countries, make this world the place it could be; **the place it should be.**

It is a program designed to be profit oriented and **based on creation**, not charity but a chance, venture capital would be an investment in people, in their future with the investor sharing in the returns from the goods produced.

Revelation 11:3

> And I will give power unto my two witnesses, and they shall prophesy a thousand two hundred and threescore days (based on a 30 day month, 42 months), clothed in sackcloth.

The Book of Revelation and the Qur'an (Koran) both contain the words of our Lord; the creator/breeder of mankind, our God and they tell us there would be appointed **two messengers to warn people of the earth. Messengers** to remind people of the role we were meant to play in our 'Life' time:

> **C Muhammad/Mohammad was chosen by the Lord, our God to be the 1st "beast"** as told in the Book of Revelation (13: 1-10); a messenger (messiah) whose appointment was foretold in chapter 11(when Muhammad was two years old, two men were seen performing what was believed to be by the children that saw it, an operation on his chest, but I suggest what happened was, the 'angels of our Lords' inserted a crystal receiver through his nostrils into his brain using his chest as a table [he had no mark/scar on his chest] and it was through this receiver he was given his "teachings" for he could not read or write and when his task was completed, sound was used to shatter the receiver, thus causing the terrible headaches he experienced and his death, when prophesied) and if you understand the 1st "beast" was Muhammad, then it would follow, the 2nd "beast," would be the Mahdi; the expected one, the messenger who would come, **unless we change, in our last days;** a messenger to remind people of the path we were meant to follow in our 'Life' time.

Revelation 13:13

> And he doeth great wonders, so that he maketh fire come down from heaven on earth in the sight of men [solar activity as indicated by lightning (the 'snakes' of St. Patrick) and the Aurora Borealis, the Northern Lights and since 1940 sunspots have increased, causing geomagnetic storms on earth].

Revelation 19.12

> His eyes were as a flame of fire, and on his head were many crowns (knowledge of many things) and he had a name written, that no one knew but he himself.

My name is Norman Harvey Lavery and **I am the second messenger** (Revelation 1:7), the last messenger whose number is 600-60-6, a teacher of righteousness **and a healer** and my wife (she is a descendent of Philip Daniels and Nancy Munroe who were married April 5th , 1877 at St. Andrews Mb.) died March 19th (it is her love and support that gave me the time I needed to learn) and it is in her memory that I am writing this letter; for **if we did not 'cure' the leech-causing cancer called capitalism and begin to follow the way of our Creator as shown by creation where needs are provided but wants have to be earned**, we will live with the future as outlined by Revelation 6:8.

The one who could show people how to restore the fertility of the land and bring forth an economic system patterned on creation); the one who in a previous lifetime had been the man/soldier called Jesus who married Mary Magdalene and who in this lifetime again married the woman who had been Mary (like Mary she had beautiful red hair and a smile to match) [**The one** who knows how to turn water into wine (make seawater potable)] and their first male child was the one who had been in his previous lifetime Muhammad/Mohammad, who like Muhammad/Mohammad survived a head wound (medical professionals said he would die, or if he lived, be a vegetable); **the one who has the mark, King of Kings, Lord of Lords** (Revelation 10:16) **on his thigh, the son of they who had once been Jesus and Mary**; the son of the man **chosen** to be the second messenger, the Mahdi (the expected one):

> **C** The man (soldier) chosen when stationed at Camp Shilo (Shiloh) Manitoba, mile 66.6 on the CNR main line (Prairie Region) [Manitoba is a Cree/Saulteax word for the god that speaks and in the Qur'an (Koran) the people of Hamyar had kings who bore the title of Tobba (man of Tobba - Manitoba?) and the number of my name (Norman - man of the North, Harvey - battle, Lavery - descended of the speaker, Revelation 21: 6 - 7 is 600 - 60 - 6); place, person, family and these numbers have a prophetic connection being common to numbers of the 'Arc of the Covenant.'] **to deliver the last warning: [The scriptures of many religions, legends and other religious texts tell of the coming (return) of the last messenger, the one who would come in what may be the last days**, the one who could bring peace and justice to world societies torn by strife and oppression. Muslims call him El Mahdi, Judaism refers to him in the Book of Daniel, Christianity, in the Book of Revelation, Zoroastrianism, the arrival of the third son of Zoroaster, who would bring forth an economic system patterned on creation (the true religion); one who could make possible the restoration of our world environment and he would do it with words not weapons.]

A future that will come to be unless we change our ways when the people of the world experience the coming ice age/global warming created famine, potable water shortages, loss of their jobs and their homes (people who see their homes as the best place to invest their money, will soon owe more on their homes than the market value and most people's debts are already much greater than their disposable/after tax annual income) and their savings, access to their money and the loss of its value, together with the loss of value of their 'investments' and pensions, but leaving their debts untouched and they begin to finally understand the future we all face, caused by the economic system we call capitalism.

Revelation 22:12

> And, behold, I come quickly; and my reward is with me, **to give every man according as his work shall be.**

Manitoba has the highest rate of child and family poverty in Canada, one of the highest number of full-time working families who fall below the poverty line and the 2nd lowest average weekly earnings; but throughout the world people are getting poorer not richer.

Billions of people live in abject poverty but counting numbers of 'poor' people does not give a clear picture of poverty for there are many degrees of poverty; and many 'effects:'

> C Poverty, the breeding ground for the social unrest, the prostitution and slavery, the crime and violence that is fuelled by the despair created by the feeling of helplessness and hopelessness that is escalating throughout the world; but if we want to eliminate the poverty, environmental degradation and economic exploitation, crime and violence that now threatens our existence as a species, we have to change the system in which they breed.
>
> C Poverty, the cause of the hunger that results in people having to depend on charity, food stamps, food banks, food aid and soup kitchens to feed themselves and their families (many of those using Winnipeg Harvest for their food needs are children); while more people are referred to food banks by provincial, city and municipal social agencies which are supposedly there to prevent the need for people to have to rely on them.
>
> C Poverty that results in growing numbers of homeless people throughout the world. Not only for single people but for whole families (many homeless people freeze to death each year). Homeless children, or children who are forced to constantly change schools through the movement of their families. [Children who are poor and hungry have little chance of succeeding in school (billions of people in the world cannot read or write) or climbing out of poverty.]
>
> C Poverty that results in children being abandoned, with women, children and families being bought and sold like animals (offer a desperate person work or extend credit for their needs and then pay them less than it takes to provide for themselves and their families or repay the debt and you reduce them to poverty for generations). Children forced by poverty into prostitution and pornography (the UN children's fund estimates about 1 million children (some as young as 5) join the numbers of sexually exploited each year with at least 1 million child prostitutes in Asia and over 500,000 in the US and Canada).

Debt bondage, a world system designed to make necessary the forced labour of people in vain efforts to pay off loans from their masters (this system is also used by the wealthy nations to exploit the resources of poorer nations) and bonded labour is another word for slavery. [The I.M.F. which loans money only to countries that adopt their economic policies of devalued currencies, sky-high interest rates, draconian budget cuts and tax increases is directly responsible for the more than 100 world banking crises over the past decades and when banks fail, who loses their savings?]

Because people can't find full-time employment that will provide a 'living' wage, the 'sweatshop' is back. Brought on by businesses that place price demands on their suppliers that cannot be met in a legal economy. Workers, many of them children, working up to 14 hours a day, 7 days a week [some are locked in at night, behind fences with armed guards] who are paid much less than the 'official' wage.

Work, the primary means by which people obtain the things they need isn't available to everyone in the world and the lack of steady full-time jobs for parents is the leading cause of child poverty (millions of Canadians and Americans are on welfare and about 2/3 of them are children) and child labour to supplement family income. Nearly 50% of all jobs created during the last 20 years were non-standard employment and this includes temporary, contract and part-time work or self-employment.

They account for over one third of all Canadian jobs and two thirds of temporary workers are adults who are often the sole income earner (it was the return of women to the workplace that sustained household income in the 1970s, 80s and 90s) and one third of temporary workers earn less than $8.00 an hour, over 50% earn less than $12.00 per hour and all work about 15 hours per week, per job. Among those aged 25 to 44, 40% of the women and 70% of men are working at part-time jobs.

Consumer purchasing accounts for about 2/3 of overall economic activity but high debt levels (estimated to be about 90% or more of after-tax income), years of unchanged income and rising taxes have left many consumers using their savings (in Canada and the US credit card delinquencies and overdue mortgages have reached a critical stage).

Employment quality is dropping. Jobs are lower paying (the greatest percentage of working Canadians earn less than $20,000 per year) and less secure and fear of job loss is a major issue in the industrialized nations of the world:

> C It is in the interests of the 'establishment' to maintain high levels of unemployment for it reduces their labour costs for new employees and employers have always used fear through the threat of unemployment as a means of control and manipulation and the current efforts of governments to reduce costs by reducing employees and constant layoffs by industry are only bringing closer a world economic collapse.

Workers in industrialized nations are hurt by competition from low-wage foreign workers in factories owned by their employer and one example of 'Free Trade' is the Barbie doll sold in Canada and the US for prices ranging from $25.00 to $100.00 - manufactured in Asia where workers are paid about $1.00 per hour. [If you want a comparison of world exploitation and fair pricing, look at Wal-Mart and other retail chain stores and stores like A Buck or Two. All have the same foreign sources of supply but compare retail prices.]

Unemployment in every nation is higher than official numbers, plus further millions who have given up looking for work and many millions are part-time because they cannot find full-time jobs [many of those who start their own businesses do so to supplement their income rather than as a main means of employed, (Canada's 'older' unemployed are now as young as 40 while about 10% of the world's population is over 60)], the discouraged 'job-seekers' try to create their own jobs (most will fail at a tremendous social and financial cost to the family).

Revelation 11:18

> And the nations were angry, and thy wrath is come, and the time of the dead, that they should judged, and that thou shouldest give reward unto your servants the prophets, and to the saints, and them that fear thy name, small and great; **and shouldest destroy them which destroy the earth.**

The Qur'an (Koran)

> **We** destroyed many generations before you when they did wrong and denied the veritable signs which their apostles had given them. Thus shall the guilty be rewarded Then **We** made you their successors in the land, so that **We** might see how you would conduct yourselves.
>
> It was **We** that ordained death among you. Nothing can hinder **Us** from replacing you by others like yourself or transforming you into beings you know nothing of.
>
> I swear by the Lord of the East and West that **We** have the power to destroy them and replace them by others better than them. Nothing can hinder **Us** from doing so. So leave them to amuse themselves and blunder about in their folly until they face the day with which they are threatened.
>
> Did **We** not create you from an unworthy fluid, which **We** kept in a safe receptacle for an appointed time?

We have been warned by the Lord, our God (the word god is an acronym for guider of development) [There is only "One" creator (Allah in Arabic)] and we would be very foolish to ignore their warnings and there is only "One" way to stop the society destroying anger, the rage fed by the poverty (poverty is the primary reason people join the military) that is sweeping across every nation of the world.

It was not too long ago a person was able to walk our streets at any hour without fear, able to feel safe in their own homes, free to travel to foreign lands without worry but these times have past and with the growing poverty brought on by our unjust systems, the worsening food and water

shortages, it is not difficult to see the future we face unless we change from the class dominated capital system we use to the **"One"** based on creation; **but, our lack of knowledge, thought or concern, for each other and the world we share has provided us with the most important ingredient needed to bring about the changes that must be made if we are to survive as a species; a common goal!**

If you believe in a Creator, would it not follow creation would be the way of the Creator?

We will all be back (born again) and we are not wise if we cannot understand we are creating the Hell we will come back to and surely no one believes the world environmental and social problems can be addressed successfully through existing world monetary and economic systems!

Genesis 2:15

And the Lord God took the man, and put him into the garden of Eden to dress it and to keep it.

We are meant to be environmental and social caretakers and if we followed the instructions we were given by the Lord, our God, Canada could easily become the "Hub" for a world trading organization the world would follow and mankind would have a long, prosperous future; but the problems facing mankind will not be overcome until people come to understand, **capitalism is the root cause of all the world's social, economic and its many environmental and health problems**, brought on by the global lack of knowledge; and the idiotic beliefs existing at all levels of our unjust societies but unless we change the world's monetary practices and begin to follow the instructions we were given by the Lord, our God, we will soon witness the next extinction; the end of our species:

> C Few people are aware the depression of the thirties was not caused by the stock market collapse of 1929; it was caused by a drought that began in September of 1929, creating dust bowl conditions when the winds came and more than one in five Canadian families needed government aid and we are again beginning to experience a world drought and water shortages, high temperatures and high Ultra Violet radiation levels bringing on a world food production collapse that will surpass any know and ask yourself, what will be the social ramifications; for now money markets have become the world's leading industry but they are still controlled by societies whose economic health and peace depends on food production and when people become aware of growing food and water shortages that are increasing food prices to levels beyond their means and this is added to their misery, then the lack of hope and the fear becoming common throughout the world (look at the growing turmoil in every nation of the world) will explode and be directed at those who they see as the cause of their problems!

I do not know why I was selected to do what must be done. I am 81 years old but there are few of our species, who can match my knowledge (knowledge is based on experience and books help us understand experience but without experience, knowledge contained in books is a questionable part of what is and without experience books teach us nothing other than a vocabulary for book knowledge without experience is not knowledge, it is belief):

> C The only person who is truly free is one who has the time and opportunity to learn from their own experiences and from the learning of others; all others are subservient, dependent on others, slaves to the knowledge, experiences of others, a system or a government and the manipulation of information, the means and the media through which people are 'led' by the establishment that controls our societies and this makes me the wealthiest person of our species in the world, **but consider the intellectual levels of the Lords of our world who live and have lived for many hundreds of years.**

Learning is a progression of discoveries, by **asking why and how** (and then finding out) for knowledge is the tree of life and learning is the lifeblood that keeps the tree growing and because of the love and support of my wife and family, it was made possible for me to have the time I needed to learn, I may be the only person, **of our species**, who understands; to a point, **what has happened, is happening** and what is more important, **what will happen** to and in our world and to its people **if we do not change** and **what we must do**, individually and collectively, **if we are to prevent it from happening**: (a person who is constantly learning/questioning will never have to worry about dementia or Alzheimer's 'disease'), but knowledge does not belong to any one person, it belongs to everyone and if not shared with others, it is valueless and with this in mind, here are a **few** revelations I put forth for you to think about. I cannot save you! I can only warn you of what lies ahead and make you aware of why, how, who, when and what we each must do if we are to survive as a species.

Already over 40% of the world is in drought due to the increased levels of carbon dioxide and our thinning atmosphere brought on by the destruction of our forests and the loss of atmospheric moisture resulting from the many jet-plane flights and in each of the past 7 years the world has not produced enough food to feed growing world populations.

Earth is losing its drinking water and with over 90% of the world's people living in poverty and a further 8% soon to be, governments seem unable to see we have a problem; but **the world is one and so is its destiny and if we do not start to work together, for the common good, then mankind as a species has a limited future.**

We are each meant to be a caretaker and a care giver but world peace and prosperity, the environment, together **with** our health has always been hampered by the desire of a person or for a people to have more than their fair share and I suggest, **unless we destroy the cancer caused by capitalism** (a system that takes away people's birthright of enough land and/or the means to provide for themselves and their families) while restricting their ability to learn and thus advance their lives and that of their society; **we are as I stated, in mankind's last days; the 'end time!'**

We have created the conditions for our own destruction; but if we want to improve the conditions for our next 'Life' regardless of the place or level we will return to, we must make the world green again improve the earth's environment and raise the economic level of the people at the bottom of today's socioeconomic pyramid (if we raise the level of the bottom, improve the conditions for all, we fashion a higher level and better conditions for ourselves now and in the future) for the quality of life and species development is not determined by a part of the earth's systems, but by all of the earth's systems and the advancement of mankind can only be realized through the strength of our individual ability to reason with each 'life' furthering their growth through learning.

Wealth, rank, power, or place of residence will not save or insulate any person from the ecological, environmental, economic and the social

dangers we all face **and remember**! In any society, at a time of crisis, or when disaster strikes, **only things for which we have a need or can be used to fill a need has a real value** and those who would have the greatest chance for survival **would not** be those at the top of today's social and economic pyramid, **it would be the people at the bottom who outnumber the people at the top by huge percentages**.

We create our own futures, as individuals, as societies and as species and it would be most unwise for any person, nation, or economic bloc to believe they will be spared, or will survive untouched what **is** and **will** happen throughout the world during the next few months; therefore **you each must help make the changes that will make it possible** for you to save yourself.

> C What will be the reaction of the world's people when they come to understand the impact on themselves and their families of the growing food and water shortages, together with a economic/financial system collapse. A system where people are exploited for their skills, knowledge, capital and labour, regardless of what the "experts" say or governments do, for the need for food to feed themselves and their families are the foundation of all economic/financial systems, the cause of most crime and many of the revolutions and wars in the past.

> C What will we do to accommodate the tens of thousands of families who will soon be forced out of the North and rural areas by the changing weather, by economic circumstances and the inability for governments to provide support programs because of declining taxes (it takes many litres of oil to heat a home in the North during a normal winter but with the high price of oil, how many will be able to afford to heat their homes).

Approximately 1/4 of the northern hemisphere (including more than 20% of China's territory and most of Russia's Siberia is covered by permafrost and many square kilometres are within one or two degrees of its melting point and as water expands as it freezes by about 10% in volume, the soils contained within the permafrost would collapse when melting occurs; but what is often forgotten is the Boreal forest comprises 1/3 of the Earth's wooded lands (50% in Russia, 35% in Canada and the balance in Scandinavia) and they are the 'lungs' of our Earth which would be wiped out when the permafrost melts, increasing the loss of atmospheric moisture and ozone, increasing heat levels in summer and winter cold, leading to the exodus of northern people, the loss of roads, rail lines and hydro generating stations.

Large areas of northern Canada are covered by permafrost which is generally less than 75m thick, overlayed by a thin layer of ground (2 to 12 ft. thick) that thaws during the summer and allows plant life to grow; but the permafrost may hold 30% or more of all carbon stored in soils worldwide [there is one other danger I have not mentioned, the oceans contain a huge amount of carbon dioxide (water will absorb its own volume of carbon dioxide and about 1% of this will turn into carbonic acid) in the form of bicarbonate and carbonate ions and probable reactions between carbon dioxide and the rocks in the sea and if all the carbonate rocks were converted back into carbon dioxide (this may have been the cause of houses in Newfoundland sliding into the sea) the resulting carbon dioxide increase and heat buildup would cause our Earth to lose its water as did Venus creating an atmosphere similar to it.] and the melting will add to the heat storing capacity of the oceans, leading to more frequent, deadlier storms and the loss of fish and animal species (this may account for the current decimation of reindeer and caribou which eat lichens grown on old-growth forests in winter):

> C Why do we not begin fish farming in our many lakes (about 50% of all seafood consumed in the world is already farm-raised but let the farmers community also be the processors)? Freshwater Asian/bighead Carp is a fast-growing excellent, tasty, healthy food for human consumption. It has less than 2% fat, loads of calcium, protein and omega-3 (mincing overcomes the bone problem) and contains no carbohydrates and fish farming is the only way we will be able to supply food for the world's people.

Our existence as a 'being' did not begin with our birth and it does not end with our death and what we must fear most is not death, which comes too all forms, for 'Life' and form, like the Creator and creation are together but separate and the one thing we should fear is that the world we will leave behind is the world we will come back to; in form and place, based solely on what we have done or did not do:

> C Former U.S. president Ronald Reagan and others like him was, when he left this Life time, a mental midget but balance is the way of creation and if you cause millions of people to live in misery, would it not be just for you to live a million 'Life' times in misery? His life as with the life of so many others was a waste and for most of us, when we return, we will be at or near the bottom of the world's social/economic structure, living in the world we helped pattern and understand one thing; **the Creator is just** and when you look at the faces of the destitute people living in misery, you are seeing people reaping the rewards (Karma) earned in their past lives!

The 'establishment/scum,' kings, queens, dictators, the religious hierarchy and political rulers, bankers, business tycoons, their families, the lackeys and other mental midgets who do not understand Revelation 22:12 and the idiots who supported and protected them. Those whose greed and ignorance led them to take advantage of others and who did not learn balance is the way of creation. Those responsible for the economic slavery and environmental degradation affecting our societies that have brought mankind to the brink of disaster; **but do not gloat!** If we do not make it possible for them to improve their lot in life, to move up, they will pull us down!

We would be wise to make our world a better place when we leave it than it was when we entered [If we raise the level of the bottom, improve the conditions for all, we create a higher level for ourselves, now and in the future] so give thought to where you will be in your next 'Life' time for **we will each receive what we have earned**:

> C We are our own Judge and jury! The brain of every Life form is an unerasable record (there is no delete) of our action and lack of action and like a computer, upon death we each learn the results of our lifetime.

and if people understood, they would have one wish; for enough time before they leave this 'Life' time to allow them to compensate for the wrongs caused by their actions or lack of action (what one doesn't do can be a greater wrong than what one does do):

> C **Why** is it not recognized the explosive growth of the Mountain pine beetle in BC is because of the increase of carbon dioxide in the soil. It is changing the make-up of tree sap, causing trees to increase their sugar levels and this 'sweetening' leads to the beetles increase **(carbon dioxide in the beverages we drink is also the leading cause of obesity in humans)** and the only way to prevent it and reverse the beetle reproduction levels is to make the soils more alkaline (spread potash/potassium fertilizer?) and **this may also eradicate the growing problem of the algae in our lakes!**

If you want to improve the health of people throughout the world educate them of the dangers of consuming carbonated beverages which turn sugar into fat, greatly increase their consumption of potassium containing foods (I suggest this will cure MS, ALS, IBD (colitis), Krohn's Disease and others; while Citric acid juices eliminates intestinal cancers) and instruct them in the benefits of filling their homes, businesses and other buildings with plants which will reduce air pollution and the growing atmospheric carbon dioxide buildup. Fruit bearing trees and plants, grown by students, those in jails and seniors and educate them of the benefits of salt with instructions to balance their sugar and salt (the iodine in salt controls intestinal bleeding) consumption.

Revelation 22 13

> I am Alpha and Omega, the beginning and the end, the first and the last (to be the first and the last, the Creator must also be everything between).

There is One Creator, one creation and the Creator and creation are One! One Creator, One creation; One, and Creation is the 'brain' of the Creator and **the "secret" of creation is**; a whole is the sum of its parts, but each part is itself a whole and our 'universe' is a membrane enclosed living atom/cell, functioning like all other living atom/cells **and creation is the way of the creator** and if you understand there is a Creator, you must also understand **the Creator is everything in creation for everything could only be within the Creator;** but without 'Life' the Creator could not learn (before creation the Creator knew nothing for there was nothing to know):

> C **Creation is a 'school' of learning in which the 'Life' that resides in people is meant to learn and thus increase their knowledge and the knowledge of the Creator but most fail to learn to understand** and are therefore destined to repeat their learning time (lessons) for when you limit your learning, you limit your knowledge, your ability to reason, your intelligence and thus your understanding.
>
> C Everyone has the ability to learn and we each learn in different ways and at different speeds, with each achieving different levels in many areas of knowledge while our understanding/comprehension is always determined by the questioning we do of what we learn from experience and what is taught (most written knowledge is untrue) and the more varied our learning and questioning, why, how, what, where, when, who, the greater the strength of their intelligence and ability to understand.
>
> C People are born unlearned and most people remain mental midgets who accept without question anything told them by those who rule our societies and control our politicians; for the level of a persons intelligence is determined by their learning and our existing economic and financial system restricts the learning of people and this then determines the intellectual level of the next generation for we are fostering the birth of people who are and who will because of their lack of learning, remain mental midgets.

and the universe would not be for it would have no purpose and this answers the number one scientific unknown. Why is there something rather than nothing; **but why would anyone** believe the Creator would want homage/veneration:

> C It is blasphemy to suggest or believe the Creator would want, expect, need or pay heed to prayers or worship, to give a damn about the clothes you wear, the shade of your skin's colour, your customs, traditions, rituals, your idiotic weak-minded religious beliefs based on incomplete, rewritten and misunderstood history books, compiled by people who want others to believe in a divine authority given to their organization so they can control people and profit from the control.
>
> C Idiots lacking in knowledge and to suggest we each are not accountable (**this accountability is to ourselves and is inescapable** for our brain is made up of the knowledge of everything we have done or have not done and **we will pay for the wrongs we have done too others**, the exploitation of the poor, women, children, the slavery of others for their labour or for sexual gratification) for what we do or don't do is to believe the Creator is unjust and this is the ultimate blasphemy/disrespect.
>
> C The Creator cannot be bought off by last minute repentance or prayers for forgiveness and to believe that anyone can speak for or act as a mediator on your behalf is to be the greatest of idiots.[People understand little about creation and must either not believe in a Creator, or not be able to understand that **if we were not held accountable, the Creator would be unjust; but they will learn there is a 'Time of Judgement' where everyone will be paid what they have earned.]**

and **why would anyone** not understand creation could not happen without a Creator and that **creation would have to be the 'way' of the Creator and creation must be within the Creator**:

> C What the scientific community calls dark energy **is** the "Life" force that is the Creator, the 'glue' that holds everything together. Invisible (not emitting or absorbing light), and dark matter is the "Life" force that is a part of the Creator sent out to learn. [A fetus is a part of the female and its brain development before birth is controlled by the female (the mental lapses experienced by pregnant women is due to the time their mind is developing the brain of the fetus and if her knowledge level is low, so will be the brain development of the fetus (this development by the mother explains the bond between siblings) which may explain autism; but it certainly explains the low mental levels of most people) and this development is determined by her knowledge level and her social, economic and the environmental conditions in which she lives; but **it is the entry of a "Life" force (the rebirth) to the fetus (the sending out) that brings on birth labour.]**
>
> C The universe/creation is a balanced living system and one must come to understand, the existence of a 'Life/force,' an immortal part of the Creator who is eternal, could not begin with birth or end with death and the Creator would have to be just, unbiased and unemotional and what happens throughout the universe (creation) is not directed by the Creator! It is directed by each Life/force's actions or lack of, which are generally the result of its character, **but without a Law. Principle, and a Rule; balance could not be achieved and there would be chaos**; but the existence of any of the three proves the existence of the others and the Creators existence!

The universe is a living structure that consists of nothing other than varying frequencies of energy resulting from the actions or non-action of the 'Life'

force it contains which are all a part of the Creator:

> C I think, therefore I am. A force ('Life') created as living thought by living thought, without knowledge or form. Created as the means for the Creator to learn! In the image of the Creator who is immortal and creation, what is or will be, began with the Creator and follows the Principle (and I will give unto every one of you according to your works), regulated by a Rule through a Law and because I learn I understand more and because my understanding is more, I grow stronger and as I grow stronger; I grow closer to the Creator.

The 'Life' force sent out to learn and creation; the universe is the growing highly complex Creator's brain and everything each 'Life' learns/experiences is retained by our brain (and the Creators) which influences our actions (and the Creators) and its development comes through the advances or decline of our learning which is/are also reflected in the Creators.

The One Principle:

> To each according to you works (Revelation 2:23) **As you do or don't do, in equal value you do unto yourself.** Call it balance, the way of all things.

The One Rule:

> **Retribution! Reward or punishment.** The only response within creation to an action, or lack of, is change and change is retribution (Karma). In equal measure to the actions force or lack of. it produces a counterpart action in value. A mirror image, an exact corresponding reverse of itself, for every action or lack of, is but half of a dipole. A pair of separated opposing energy values (all matter consists only of varying energy levels) and its moment (duration/force/frequency) is the product of the energy and distance between the dipole points, determined by the degree (or lack of) of action.

The One Law:

> The 1st Law of Thermodynamics is: 'Energy can neither be created or destroyed,' but that is not correct. Energy is constantly being created by the action or non-action of a 'Life.' Created through electron movement, although a given system can gain or lose energy only to the extent that it takes it from or passes it to its environment (transfers/transforms it from one form to another) and this makes it evident **energy is a law! Energy the Law of the Creator**, which enforces the Principle through the Rule! [Electrons are called the primary electrical glue that binds atoms into molecules and it is suggested electrons are indivisible. but electrons do not have form or place! They are the Law in action; a force (justice) that enforces the Principle through the Rule (its counterpart is sound) created by the difference between a positive and a negative action and their numbers make up all mass/matter throughout the universe; for the universe consists only of the formless force that is the Creator; 'Life' sent out as a means for the Creator to learn and the Law; energy from which all mass/matter is constructed!]

A never-ending process of 'Life/spirit designing creative evolution through the Rule that maintains the balance/order (the Principle) of creation within a Law (energy) that enforces its own justice (protein is the messenger of the Principle, Rule and Law) and without the three; nothing (mass/matter - the knowledge of the Creator) could be and a 'Life/spirit' and the Creator could only exist without form.

Over the years I have written many letters outlining the many dangers we face; but none listened. One of the dangers I outlined was the probability, based on environmental destruction, the earth could **again** turn over [according to historical (written) records it turned over about 2500 years ago and the next "Transit of Venus" (it passes directly between the Earth and the Sun) will be in 2012] and in a recent copy of The Globe and Mail, the following article suggests I again may be right and Dec. 21, 2012 is also the date the Mayan Long Count calendar is said to run out:

Solar storms ahoy:

> An 11-year epoch of increasingly severe solar storms that could fry power grids, disrupt cell-phone calls, knock satellites back to Earth, endanger astronauts in space and force commercial airliners to change their routes to avoid deadly solar radiation could begin as early as this fall. US researchers announced last week. When the solar cycle reaches its peak in 2012, it will hurl at earth mammoth solar storms with intense radiation and clouds of highspeed subatomic particles millions of miles across, they added. There is some disagreement on exactly when the new cycle will begin it could be this year or as late as 2008 - but there's agreement that "the next sunspot cycle will be 30 to 50 per cent stronger than the last one," the scientists, with NASA and the National Centre for Atmospheric Research, said in a statement. *Source: The San Francisco Chronicle*

Norman Harvey Lavery, the Mahdi (the expected one),

the last messenger, the one whose number is 600-60-6

If you understand, and want further information, contact me and send this message too others before it is too late! [Jerusalem is recognized through its connection to four religions but consider the recognition that would come to the birthplace of **'the chosen one;'** the one who could show **creation is the only true religion**, the one whose knowledge and understanding could save our species from extinction]

In closing:

The three nation summit at Montebello Quebec to be held this week will have water exports on the agenda and I agree that the resources of our world do not belong too any person or group of people but too all people; but as I stated, **I know how to make seawater potable.**

Armstrong, Nicole (WSD)

From: kimavant@mts.net
Sent: August 24, 2007 10:09 AM
To: +WPG1218 -Water Quality (WSD)
Cc: Williamson, Dwight (WSD)
Subject: Open Houses

Good morning.

I am very happy to hear that the Manitoba Government is taking steps to educate the public on steps they can take to clean up the environment and Manitoba's waterways. I've personally been an advocate to using safer products not only for the environment but also for the safety of family members.

I would be most interested to showcase our environmentally friendly products by setting up a display and supplying information. For those that are intested they can learn more about the small changes they can make, starting in their home, which could make a big change in the outlook of our waterways and environment.

Feel free to forward my contact information to anyone interested in learning more.

Thank you for your consideration.

Kim Avanthay
Melaleuca Marketing Executive
East Selkirk, MB
Home: 204-482-9215
Email: kimavant@mts.net

Armstrong, Nicole (WSD)

From: dprd@mts.net
Sent: August 29, 2007 1:14 PM
To: +WPG1218 -Water Quality (WSD)
Subject: Public input - Protecting Province water ways

I have read your document "Reducing Nutrient Contributions from Urban and Rural Residential Sources" and as I will not be attending the open houses I provide the following commnets; 1. AS suggested, please follow Minnesota's lead and restrict fertilizers containing phospherous from all lawns. Do not make this over complex by regulating only lawns within a certain distance of waterways. It is important that the only choices available in Manitoba be phospherous free, this allows for the retailers better meet this demand.
2. As for detergents, while i support a complete ban in manitoba, I can accept that this may be difficult. Clear labeling would enable me to make a phospherous free choice. Right now i find it very difficult to find phosphate free soaps, i need to go to specialty stores.

Good luck and keep up the good work...please save my lake.

DJ Sigmundson
Box 1727
Gimli, Mb
R0C 1B0

13

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September 13, 2007

Reducing Nutrients
Water Quality Management
Section
Manitoba Water Stewardship
160 – 123 Main Street
Winnipeg, MB R3C 1A5

Dear Sir/Madam:

The Thomas Sill Foundation is working with a partnership of 9 charitable foundations which represent a large portion of the Lake Winnipeg watershed in Manitoba. Currently, the partners are providing 2 years of operational funding for the Lake Winnipeg Research Consortium.

Along with the Selkirk and District Community Foundation, we attended the Open House on September 12th which dealt with "Reducing Nutrient Contributions from urban and rural residential sources". This event dealt largely with cosmetic fertilizers and dishwasher soap.

Considering what is at stake, we believe that a ban on cosmetic fertilizers and dishwasher soap containing phosphates should be expedited. We see no value in risking the further degradation of our water, and Lake Winnipeg, by pursuing the frivolous use of phosphates.

Minnesota's example should be followed immediately with improvements. That is, we need not wait for the rest of Canada, just as Minnesota has not, apparently, waited for a USA-wide policy.. Also Minnesota's laws should be expanded upon to prohibit phosphate fertilizers in vegetable or flower gardens which can be enriched with compost and fish-based fertilizers.

While the challenges of industrial agriculture and municipal sewage treatment are more onerous, we view action on cosmetic fertilizers and dishwasher soaps to be "low hanging fruit" that can be plucked immediately.

. . . . . continued

Lake Winnipeg drains 4 provinces and 4 states. It behooves the Province of Manitoba to be the Canadian leader, even if Minnesota has shown us the way in the USA.

Yours truly,

THOMAS SILL FOUNDATION INC.

HUGH ARKLIE
Executive Director

HA/mh

cc: *Bud Oliver*
Selkirk & District Community Foundation
Box 400
Selkirk, MB R1A 2B3

Landscape Manitoba

c/o 808 MURIEL STREET
WINNIPEG, MB R2Y 0Y3
PHONE: (204) 889-5981
FAX: (204) 888-0944
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WEBSITE: www.canadanursery.com/lm

Member Canadian Nursery Landscape Association

September 10, 2007

Reducing Nutrients 10
Manitoba Water Stewardship
Suite 160, 123 Main Street
Winnipeg, Mb. R3C 1A5
Attn: Dwight Williamson, Director

Re: Proposed Approaches To Reducing Nutrient Contributions From Urban And Rural Residential Sources

Dear Mr. Williamson:

Thank you for the opportunity to provide input on the proposed approaches to reducing nutrient contributions from urban and rural residential sources.

Landscape Manitoba is an association of "green professionals" representing landscape design, installation and maintenance companies, nurseries, green houses, sod growers and retail garden centres. Our members are the foundation of the landscape industry in Manitoba and we want to do our part in reducing water quality problems.

We recommend replacing the term "cosmetic" with "plant health" in the Water Stewardship's recommendations and regulations. Well-maintained turfgrass and landscape plants offer much more than basic cosmetic improvement. Healthy landscapes improve air quality, control soil erosion and keep playing fields and playgrounds safe for athletes and children. Operational costs are reduced, health hazards from disease carrying insects decrease while property values are maintained or increased. Industry professionals and homeowners employ fertilizers to provide the vital nutrients needed to maintain these healthy landscapes.

We want to ensure the proper application of nutrients is not restricted by the recommendations and regulations presented by Water Stewardship. In addition, we do not want the recommendations to discourage fertilizer use. Correctly applied fertilizer **does not** contribute to water quality problems. It is quite the contrary. Many studies have proven that lawns that are thin and weak due to poor maintenance and lack of fertilization have increased nutrient run-off. We feel correctly educating the public on the proper way to select and apply fertilizer is vital. As the public becomes better informed, we will actually see fewer nutrients run-off from our landscapes.

"Nitrogen and phosphorus in the runoff water from the unfertilized turf exceeded that from the fertilized turf by 24% for nitrogen and 41% for phosphorus" (Kussow, Wayne R., Contributions of Nitrogen and Phosphorus to Surface and Groundwater from a Kentucky Bluegrass Lawn. Retrieved May 5, 2006 from University of Wisconsin-Madison, Department of Soil Science website: http:/www.soils.wisc.edu/soils/N-P-Gwater.html)

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Landscape Manitoba agrees with the approach for restricting the application of fertilizer containing phosphorous as long as there is an adequate supply of phosphorous free fertilizer available at the retail level. The major professional lawn care companies operating in Manitoba have already eliminated phosphorous from their fertilizer blends. However, the public's increasing preference for organic fertilizers creates a problem at both the commercial and retail levels at it is not possible to obtain organic fertilizers without phosphorous. Regardless of the product being applied it is important to stress, that it is **not** the source or the type of fertilizer that causes the problem, it is the improper application that can contribute to the problem. This should be the major focus of any restrictions and/or recommendations.

Landscape Manitoba recommends fertilizers containing phosphorous be allowed for use on newly established turf or phosphorous deficient lawns. The presence of phosphorus helps establish or repair lawns more quickly and actually reduces nutrient run-off. In Minnesota, where fertilizers containing phosphorus are already restricted, this decision to apply phosphorus in these situations is at the discretion of the landscaper, and from all reports is working well.

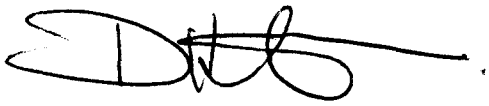
Developing and implementing a public education program about the importance of properly maintaining our green spaces will offer the greatest reduction in phosphorous from our landscapes. Possibly showing a fertilizer label with the analysis "24-0-10" to reinforce and show the consumer exactly what to look for would help them make the right choice at the retail level. The public needs to be aware of the importance of applying fertilizers at the correct rate and blend and removing any over application to hard surfaces. Applying fertilizers for "plant health" will not negatively impact water quality and, as shown by many studies actually reduces nutrient runoff.

Landscape Manitoba is willing to work with Water Stewardship in the development of educational pieces. We can help educate and distribute them to the public through our network of garden centres, lawn care companies and other retail opportunities. Combining the resources of Water Stewardship and the professionals in the green industry, we have the opportunity to reduce nutrient run-off and have beautifully maintained landscapes we can all be proud of.

Landscape Manitoba offers its expertise in helping the Province develop an education program to train Manitobans in the correct use of fertilizers. We strongly believe that educating the public will have the greatest reduction in nutrient loading to our waterways.

We look forward to working in partnership with you.

Yours truly,



David Hinton, Director
IPM Chair, Landscape Manitoba

Contributions of nitrogen and phosphorus to surface and groundwater

from a Kentucky bluegrass lawn

By: Wayne R. Kussow, Department of Soil Science, University of Wisconsin-Madison

Improperly maintained lawns suffered 76 per cent higher runoff than fertilized turf.

A common public perception is that fertilizer applied to home lawns is a major contributor of nitrogen and phosphorus to surface water and of nitrate-nitrogen to groundwater. Algal blooms on urban lakes and high nitrate concentrations in groundwater are often blamed on lawn fertilization.

Research conducted in the U.S. indicates that lawns are not major contributors of nitrogen and phosphorus to the environment. In 1991, I decided to test this finding in the Madison, Wis. area.

Methods

Research plots were set up to simulate urban conditions. The topsoil was stripped off, the subsoil compacted in some plots, and then the topsoil replaced. In some plots, the topsoil was rototilled into the subsoil to break up the topsoil-subsoil interface. The area was seeded to a four-way blend of Kentucky bluegrass. Devices to collect runoff water and leachate were then installed.

The plots have been fertilized each year with 4.0 lbs. nitrogen/1,000 ft.^{2}, split into four equal applications. The nitrogen was applied approximately on May 15, July 1, September 15 and October 20. The plots were mowed at 2.5 in. every four to seven days. Irrigation water was applied when the grass became bluish-green in colour, indicating moisture stress.

Results 1993 and 1994

During this period, the objective was to see how the subsoil compaction, resulting from building construction and the layering of topsoil over compacted or uncompacted subsoil, affects the amounts of runoff water and losses of nitrogen and phosphorus. What I found:

1. The amount of runoff water averaged 1.22 in. per year, and 72 per cent of this was collected when the soil was frozen.

2. Nitrogen in the runoff water averaged 0.30 lbs. per acre. Sixty-one per cent of this nitrogen was attributed to runoff during winter and from snow melt.

3. Phosphorus in the runoff water averaged 0.24 lbs. per acre, and 72 per cent of this was collected when the soil was frozen.

4. The amount of leachate averaged 18.03 in. per year. This leachate contained an average of 2.0 lbs. of nitrogen per acre per year, and had an average nitrate-nitrogen concentration of 2.14 parts per million (ppm).

5. Soil disturbance effects on the amounts of runoff and N and P losses were evident only when the soil was not frozen. Mixing the topsoil into the subsoil was more important than subsoil compaction. The effects of this practice reduced summer runoff by 50 per cent (from 0.18 to 0.09 inches) and N loss by 35 per cent. There was no effect on P loss.

1995 and 1996

The treatments during this two-year period were selected to show how the amounts of runoff water and nutrient losses were affected by:

1. Lawn fertilization – none vs. 4 lbs. of nitrogen per year.

2. Type of fertilizer applied to turfgrass – natural organic vs. synthetic.

3. Clipping management – mulch mowing vs. clipping removal.

Data collected from this two-year period showed that:

1. The amount of runoff water was 1.18 in. per year, with 82 per cent from frozen soil.

2. Nitrogen loss in the runoff water averaged 0.22 lbs. per acre per year. Runoff water from frozen soil contained 74 per cent of the total nitrogen.

3. Phosphorus loss in the runoff water averaged 0.39 lbs. per acre per year, with 90 per cent from frozen soil.

4. The amount of leachate totaled 14.59 in. per year and contained, on average, 2.0 lbs. of nitrogen per acre. Nitrate-nitrogen concentration averaged 2.84 ppm.

5. By not fertilizing the lawn for two years, turf thinned out to the point where the amount of runoff water was 76 per cent higher than fertilized areas.

6. Nitrogen and phosphorus in the runoff water from the unfertilized turf exceeded that from the fertilized turf, by 47 per cent for nitrogen and 158 per cent for phosphorus.

7. Amounts of nitrogen in the runoff water were 23 per cent less for the natural organic fertilizer than the synthetic product. Phosphorus loss was the same for both.

8. As compared to where clippings were removed, mulch mowing slightly decreased the amount of runoff water but had no influence on the concentration or amount of nitrate-nitrogen in the leachate.

1997 and 1998

During this two-year period, we tested the effect of nitrogen form in lawn fertilizer on nitrogen in runoff water and leachate. The nitrogen form ranged from urea, which is 100 per cent water-soluble, to

several forms of slow-release nitrogen, and to 100 per cent natural organic nitrogen. Observations during this two-year period were:

1. The amount of runoff water per year was 1.22 in. Only 55 per cent came from frozen soil, 23 per cent less than in the previous two-year period.

2. With 23 per cent more of the runoff water occurring during the growing season, the total amount of nitrogen in runoff water increased to 0.58 lbs. per acre per year. In this case, the amount of runoff nitrogen coming from frozen soil was only 47 per cent of the total for the year.

3. The amount of phosphorus in the runoff water also increased – from an average of 0.32 to 0.44 lbs. per acre per year, with just 53 per cent coming from frozen soil.

4. Leachate for this period averaged 14.99 in. The leachate contained 1.85 lbs. of nitrogen per acre per year, and the nitrate-nitrogen concentration averaged 1.60 ppm.

5. Depending on which type of nitrogen was applied, annual runoff loss of nitrogen ranged from 0.34 to 0.85 lbs. per acre per year. The greatest nitrogen losses occurred when a biosolids fertilizer was applied. Lowest losses resulted when methylene urea or IBDU were used as nitrogen carriers.

6. The amount of phosphorus in the runoff water did not vary among the fertilizer treatments even though the applied phosphorus amounts ranged from 0 to 25 lbs. per acre per year

Summary

Six years of data were collected from a Kentucky bluegrass lawn established on silt loam soil disturbed in the same manner as in an urban area. The site had a 5.5 per cent slope. The amount of runoff water collected averaged 1.17 in. per year, amounting to 3.8 per cent of the area's long-term annual average precipitation of 30.9 inches. On average, 70 per cent of the annual runoff occurred when the soil was frozen.

Leachate collected averaged 16.43 in. per year and accounted for 53 per cent of average annual precipitation. For the six-year period, 14 times more water was collected as leachate than as runoff water.

Annual losses of nitrogen and phosphorus in the runoff water averaged 0.33 and 0.32 lbs. per acre, respectively. Sixty-one per cent of this nitrogen and 72 per cent of this phosphorus was in runoff collected when the soil was frozen.

Leachate nitrogen averaged 2.25 lbs. per acre per year, nearly six times the amount of nitrogen lost in the runoff water. All but a trace of nitrogen in the leachate was in the form of nitrate. Leachate nitrate-nitrogen concentrations annually averaged 1.92 ppm for the six-year period.

Discussion

To fully comprehend and appreciate the results of this study, you must place the results in some kind of context. Watersheds that supply the phosphorus associated with lake eutrophication and contamination of groundwater with nitrate typically encompass rural *and* urban areas. Therefore, there is logic in comparing the nitrogen and phosphorus losses observed in this study to losses from agricultural land.

During six years of careful testing, Dr. Kussow could not establish a relationship between runoff losses of phosphorous and the rate of phosphate fertilizer applied.

Several long-term research projects conducted in the Midwest provide a comprehensive perspective on what can be expected in runoff water, erosion, and nutrient losses from agricultural land. These studies have shown that:

1. The amounts of runoff water from farm fields during the growing season typically range from about 5 in. for a row crop to 2 in. for hay or pasture. I measured an average of 1.2 in. of runoff water per year, with only about 0.35 in. lost when the soil was not frozen.

2. Annual sediment loss, if controlled with conservation practices, ranges from 5 to 7 tons per acre for row crops, to as little as 0.1 ton for pasture. In the present study, sediment losses were too low to measure accurately, but other research shows losses that average about 0.005 ton per acre.

3. Nitrogen losses in runoff water from cropland may range anywhere from 4 to 20 lbs. per acre per season, while phosphorus losses average about 10 lbs. per acre. Comparable numbers from my study were 0.38 lbs. of nitrogen and 0.32 lbs. of phosphorus for the entire year. Losses from non-frozen soil average 0.16 lbs. of nitrogen and 0.09 lbs. of phosphorus per acre per year..

4. The amount of nitrogen leached from agronomic crops has been reported to be in the range of 21 to 67 lbs. per acre per season. This is in sharp contract with the six-year average of 2.25 lbs. nitrogen per acre per year shown in this study.

5. Nitrate-nitrogen concentrations averaged over the season from agronomic crops have been reported to be in the range of 12 to 20 ppm. My average concentration was 2.2 ppm of nitrate-nitrogen. Other researchers have found even lower values for turf.

From these numbers, it appears that properly managed turfgrass, when compared to agronomic crops, yields only about 5 per cent as much runoff water during the growing season, contributes less than one per cent as much sediment, nitrogen and phosphorus in the runoff water, allows only 10 per cent as much nitrogen to leach, and maintains leachate nitrate-nitrogen concentrations that are only about 15 per cent those for agronomic crops.

I observed that, depending on the year, 47 to 90 per cent of the nitrogen and phosphorus in runoff water exited the Kentucky bluegrass when the soil was frozen. The question raised by this observation lies in the source of this nitrogen and phosphorus. There are multiple studies that clearly indicate that this nitrogen and phosphorus are being leached out of the frozen, desiccated turfgrass. The same holds true for all other types of vegetation in the landscape, and explains why phosphorus concentrations in municipal storm sewer water show a minor peak at the time of leaf fall and a major peak at snow melt. It also explains why the ratio of nitrogen to phosphorus measured in the runoff water was nearly 1:1 and not even close to the 14:1 ratio of nitrogen to phosphorus in the fertilizer applied over the six years of this study.

Conclusions

The public perception that lawns and lawn fertilizers are major contributors of nitrogen and phosphorus to lakes, streams and groundwater is false. These contributions are over-shadowed by those from agricultural lands.

The notion that banning phosphate application on home lawns will significantly reduce lake eutrophication is likewise false. With six years of data in hand, I examined the relationship between runoff losses of phosphorus and the rates of fertilizer phosphate applied. For all practical purposes, there was no relationship. As long as we maintain green landscapes, there will be a small but consistent release of phosphorus into urban surface water from vegetation, regardless of whether fertilizer is applied. Failure to maintain quality turf through fertilization carries the risk of increasing amounts of runoff in urban environments.

These conclusions should by no means serve as a green light to indiscriminately and irresponsibly apply fertilizer on home lawns. It is irresponsible to apply more nitrogen than required to maintain an attractive lawn or to apply phosphate and potash when soil tests indicate that they are not needed. It is even more irresponsible not to clean up fertilizer misapplied to impervious surfaces.

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FOCUS of the Month

FOCUS: TURFGRASS RESEARCH

Where is Phosphorus Run-Off Coming From?

How much phosphorus is there in run-off from lawns? Are restrictions on fertilizer use necessary? If so, will they lead to noticeable improvements in water quality? These are some of the questions addressed by this research.

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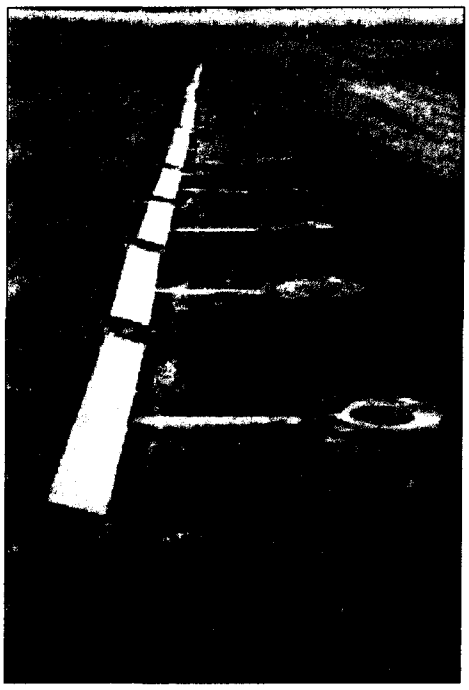
Growing public concern in the early 1990's about the impacts of lawn fertilization on lake and stream water quality provided the impetus for this study. Since then, several units of government at community to state levels have imposed restrictions on phosphate applications on lawns. How much P is there in run-off from lawns, are restrictions on fertilizer use necessary and, equally important, will they lead to noticeable improvements in water quality? These are some of the questions addressed by this research.

The site for the study was created at the University of Wisconsin O.J. Noer Turfgrass Research and Education Facility. To simulate urban conditions, two successive cuts of soil were removed, the subsoil graded to a six percent slope, the second cut of soil replaced and compacted in some areas, and then the topsoil brought back.

In some areas half the topsoil was rototilled into the subsoil and in others simply layered over the compacted or un-compacted subsoil. The area was seeded to a four-way blend of Kentucky bluegrass cultivars. Plots measuring nine ft. by 32 ft. were laid out, bounded by plastic lawn edging and run-off collection devices installed on the down slope ends (figure 1). Volumes of water from every run-off event were then measured and samples collected for laboratory analysis.

Figure 1

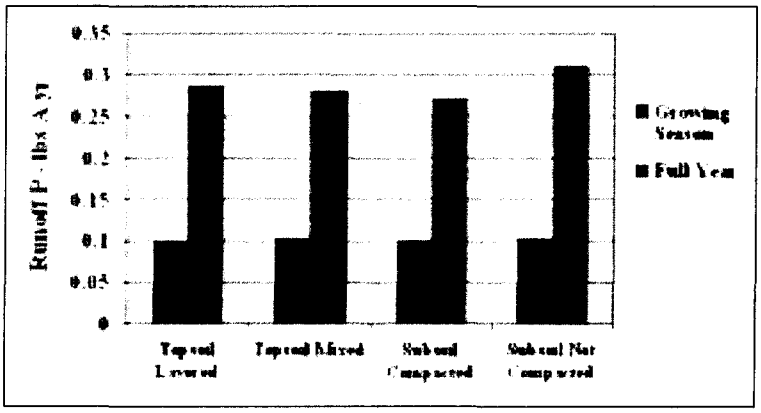


Throughout the study the routine management practices were those for a high quality lawn. Fertilization consisted of four 1.0 lb/M nitrogen applications made each year during the time intervals of May 1 to 15, July 1 to 15, September 1 to 15, and after the last mowing of the year, which was somewhere between October 15 and 30. Mowing was consistently at a height of two and one-half inches at four to seven day intervals depending on growth rate. The plots were irrigated with 0.5 inch of water whenever the grass turned bluish-green, an indication of moisture stress. A broadleaf herbicide was applied each September.

The study was conducted for six years, with the experimental treatments changing every two years.

The first two years were devoted to measurement of the effects of soil disturbance on the amounts of run-off water and its P content. In the second two-year cycle, the treatments were type of fertilizer and grass clipping management. For the last two years, the variables were type of fertilizer N carrier and the amount of phosphate applied.

Figure 2



Soil Disturbance Effects

Subsoil compaction destroys the larger soil pores, thereby slowing drainage and increasing the potential for water run-off. Rototilling some of the topsoil into the subsoil breaks up the topsoil-subsoil interface and was expected to favor drainage and reduce water run-off.

Therefore, it was surprising in this study that none of these supposedly undesirable soil conditions significantly increased run-off during the growing season. Subsoil compaction and topsoil layering should not affect run-off during the winter when soil is frozen. It turned out that over the two-year period, 74 percent of the total amount of run-off occurred after the soil was frozen and the major portion of this was from snow melt. This dominated in terms of the

Phosphorus *continued on page 50*

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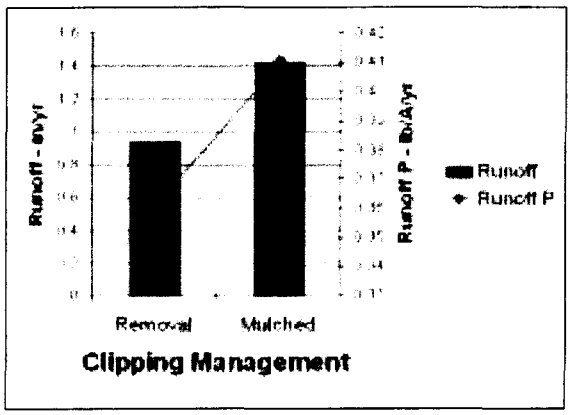
Phosphorus *continued from page 48*

Figure 3



total annual amount of run-off and the end result was that the soil conditions created had no influence on run-off volume when viewed over full 12-month periods.

With no treatment effects on the amounts of run-off water, it's not surprising that subsoil compaction and topsoil layering had essentially no influence on the P content of the run-off water (figure 2). It is important to note in this figure that run-off P loss during the growing season was less than one-half the total for the year. In fact, 72 percent of the total annual P loss occurred during the winter months.

Type of Fertilizer Effects

The fertilizer treatments tested during 1995 and 1996 were synthetic vs. organic vs. no fertilizer. The synthetic fertilizer was Scotts Turf Builder 29-3-4, while the organic fertilizer was Milorganite 6-2-0, a dried activated sewage sludge product.

From the standpoint of amount of run-off and P loss, there seemed to be some advantage to applying the organic rather than the synthetic fertilizer (figure 3). Use of the organic fertilizer noticeably increased earthworm activity in the plots. It is well known that worm channels are very effective in channeling water into soil, which may very well have accounted for the noticeable reduction in the amount of run-off water. But when viewed over 12 month periods of time, there was little difference in the amounts of run-off P between the two types of fertilizer.

The most striking results in figure 3 are the amounts of run-off water and P loss that occurred when no fertilizer was applied. On average, run-off was 78 percent greater from the unfertilized plots than from the fertilized plots. The contrast in amount of P in the run-off water was even greater. Not applying fertilizer increased run-off loss of P by 147 percent. The reason why not fertilizing the lawn so dramatically increased run-off was that the grass thinned out so badly that the rate of water flow across the soil surface increased, thereby allowing less time for infiltration into the soil and more run-off occurred.

Phosphorus *continued on page 52*

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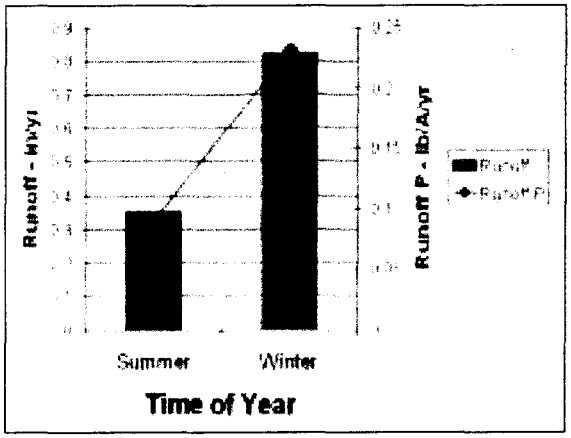
Phosphorus *continued from page 50*

Figure 4



Clipping Management Effects

Mowing the lawn with a mulching mower rather than removing the clippings increased the amount of run-off water and P loss (figure 4). The 51 percent increase in the amount of run-off water is difficult to explain, but was consistent over both years. The 14 percent increase in the amount of P in the run-off water (figure 4) can be attributed to leaching of P from the clippings.

Rate of P Application Effects

When the rate of fertilizer phosphate applied was increased from zero to 0.48 lb/M, the amount of P in the run-off water increased from 0.38 to 0.49 lb/acre/year (figure 5), or 28 percent. Further increases in the rate of phosphate application increased the P loss, but not nearly as great as the lowest rate of application. In other words, the amount of P in the run-off water was not directly proportional to the amount of phosphate applied.

Time of Year Effects

An important finding in this study was the time of year when the major portion of the annual run-off occurred and the quantities of P in that run-off water. Over the six years of this study, run-off during the period from April to January averaged 0.35 inches (figure 6). This amounted to only 1.25 percent of the total precipitation during that period and 30 percent of the annual run-off. The other 70 percent of the run-off was from temporary thaws, rain falling on frozen soil and snow melt.

Run-off losses of P paralleled the amounts of run-off itself (figure 6). Of the six-year average annual loss of 0.32 lb P/acre, nearly 72 percent was in the winter run-off water. This raises the intriguing question of where that P is coming from. With the high quality turf maintained in this study, there was no soil sediment in the run-off water. Hence, soil sediment was not a source of run-off P.

Snow melt came at least four months after the last fertilizer application, by which

Phosphorus *continued on page 54*

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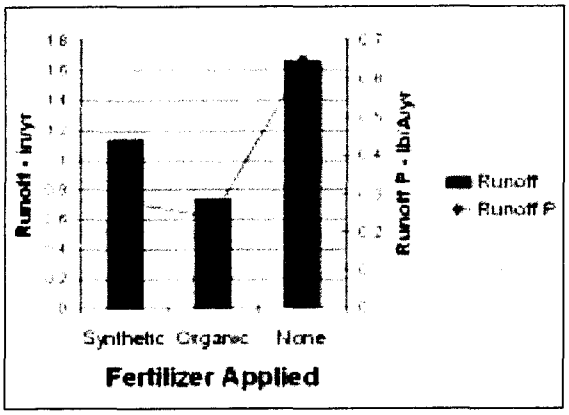
Phosphorus *continued from page 52*

Figure 5



time it is reasonable to assume that most, if not all, of the water soluble ammonium phosphate P fertilizer had been washed into the soil. If not soil and possibly not fertilizer applied the previous growing season, where did the run-off P come from?

Researchers have long noted that there is a flush of P in urban run-off water that coincides with the dropping of leaves from deciduous trees. Water solubility of the P in tree leaves has been measured and found to be substantial, particularly in light of the quantities of leaves a single mature tree drops each fall. Similar results have been obtained with prairie vegetation, ground covers, and agronomic crops. These observations prompted measurement of water soluble P in Kentucky bluegrass leaf tissue.

To measure the water soluble P in the turfgrass, the grass was clipped to ground level from one sq. ft. areas and taken to the lab for measurement of the total and water soluble P contents.

The P was extracted with the amount of water equivalent to a one-inch of rain. Extractions were done on fresh clippings and clippings that were air-dried or first frozen and then air-dried to simulate winter conditions. Potential leaching losses of turfgrass P were then calculated for all samples. The potential leaching losses were substantial, even for the fresh clippings (figure 7). Drying and or freezing and drying increased the water solubility of the turfgrass P from six to 20 percent of the total amount of P. As a result, desiccated Kentucky bluegrass appeared to have the potential for releasing something in the range of 1.0 to 1.5 lb P/acre in a single year.

Whether from fresh, actively growing turfgrass or desiccated turfgrass, the potential loss exceed by a substantial amount the quantities of run-off P measured during comparable times of the year (figure 7). A substantial but unknown portion of the P leached from turfgrass can be expected to be washed into soil and not contribute nearly as much to the quantity of P in run-off water as indicated in figure 7.

Nevertheless, the grass itself cannot be overlooked and is potentially a major source of the P in run-off water. An important

Phosphorus *continued on page 56*

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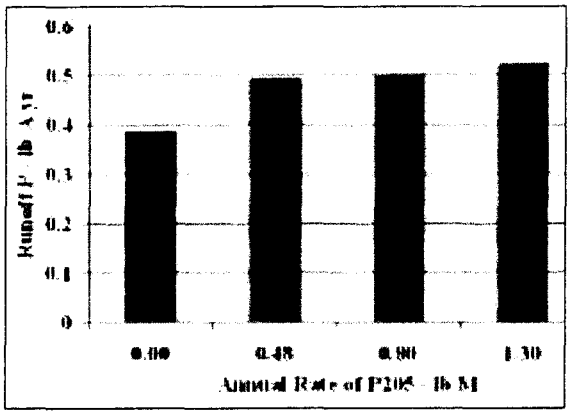
Phosphorus continued from page 54

Figure 6



implication here is that no matter how we manage landscape vegetation, there will always be a certain amount of P in the run-off water that originates in that vegetation.

Concluding Remarks

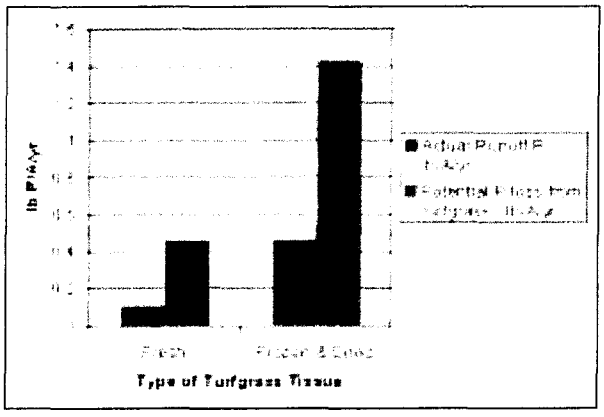
The run-off losses of P in this study need to placed into perspective. A survey of literature suggests these losses are typically three to four times greater than for a mature forest but one-tenth or less that from row crops and one-fifth or so of that from prairie vegetation.

While very few attempts have be made to quantify various sources of P in urban run-off water, initial indications are that during the growing season lawns may be contributing anywhere from 14 to 52 percent of the P measured. What the contribution is over an entire year is unknown. These research results tell us that when an effort is being made to reduce the P loading of a particular body of water, singling out lawns may well not be targeting the major P source.

In this study soil sediment was not a source of the P in the lawn run-off water. Therefore, the influence of soil test phosphorus levels on the amounts of P in run-off water could not be examined. But sediment losses occur in home lawns. A Minnesota study has measured P concentrations in the run-off water containing varying amounts of sediment from a large number of home lawns with widely ranging levels of soil test P. When viewed over all the lawns, there was no significant relationship between the two measurements. Interestingly, when lawns where soil tests indicated a need for the nutrient and fertilizer P was applied, concentrations of P in the run-off water were less than from lawns not fertilized with P.

Phosphorus coming from vegetation in the landscape represents a level below which further reductions are not practical. Regulatory agencies need to recognize this when they set standards for reducing P in urban run-off water. They also need to recognize there is no research that clearly establishes how much of the P in run-off from lawns is actually coming from soil, fertilizer and the vegetation in the landscape.

Figure 7



Without this information, there is no assurance regulation of fertilizer P use will substantially or even measurably reduce lawn contributions of P to urban run-off water.

This study was conducted on a high quality Kentucky bluegrass lawn with no soil sediment losses and P losses in the run-off water that were small compared other ecosystems. The few studies conducted on home lawns in the upper Midwest indicate the amounts of run-off during the growing season can be three to four times more and the P loads one-half to one and one-half greater than found in the present study. This leads to the observation that quite possibly the most effective route to reducing P loss from lawns is to educate people on how to maintain high quality lawns that minimize water run-off and sediment losses.

Unfortunately, broad adoption of the requisite management practices is a long-term and difficult process. Reality is that regulatory agencies are under great public pressure to do something NOW. The path most commonly being followed is that of regulation of fertilizer phosphate use on lawns even though the effectiveness of these regulations is very questionable.

The regulations that are already in place ban phosphate application on established lawns with high or excessive levels of soil test P and P cannot be applied without a soil test indicating the need to do so. Generally, use of starter fertilizer for turf establishment purposes is exempted from this regulation.

Will leaving fertilizer P off lawns with high levels of soil P adversely affect lawn quality? No, at least not in the short run. Our research has shown that when fertilizer phosphate is applied to turf growing in soil with adequate amounts of P, the turfgrass doesn't even recognize that the fertilizer phosphate has been applied.

But over time, plant available soil P will be depleted and at some point the need for fertilizer P will arise. The rate of depletion depends on many factors, among which are type of soil, how the grass is being managed, annual rates of N application and clipping management. This is why it's essential that when fertilizer P is not applied to comply with regulations, the soil be tested every three to four years to track the rate of decline in the P supply.

TPI

Info Central

Key Words: phosphorus, run-off, fertilizer

Category Codes: RS

24

Contributions of Nitrogen and Phosphorus to Surface and Groundwater from a Kentucky Bluegrass Lawn

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INTRODUCTION

A common public perception is that fertilizer applied to home lawns is a major contributor of nitrogen and phosphorus to surface water and of nitrate-nitrogen to groundwater. Algal blooms on urban lakes and high nitrate concentrations in groundwater are often blamed on lawn fertilization.

Research done elsewhere in the U.S. has indicated that lawns are not major contributors of nitrogen and phosphorus to the environment. In 1991, I decided to test whether or not this was true in the Madison area.

METHODS

Research plots were set up to simulate urban conditions. The topsoil was stripped off, the subsoil compacted, and then the topsoil replaced. The area was seeded to a four-way blend of Kentucky bluegrasses. Devices to collect runoff water and leachate were then installed.

The plots have been fertilized each year with 4.0 lb nitrogen/1,000 ft^2 split into four equal applications of 1.0 lb nitrogen. The application dates were approximately May 15, July 1, September 15, and October 20. The plots were mowed at 2 ½ inches every 4 to 7 days. Irrigation water was applied when the grass became bluish-green in color, indicating moisture stress.

RESULTS

1993 and 1994

During this period, the objective was to see how the subsoil compaction resulting from building construction and the layering of topsoil over compacted or uncompacted subsoil affects the amounts of runoff water and losses of nitrogen and phosphorus. What I found was:

1. The amount of runoff water averaged 1.35 inches per year and 73% of this was collected when the soil was frozen.
2. Nitrogen in the runoff water averaged 0.24 pound per acre. Runoff during the winter and from snow melt contributed 59% of this nitrogen.
3. Phosphorus in the runoff water averaged 0.32 pound per acre and 66.8% of this was collected when the soil was frozen.
4. The amount of leachate averaged 18.03 inches per year. This leachate contained an average of 2.2 pounds nitrogen per acre per year and had an average nitrate- nitrogen concentration of 2.74 parts per million (ppm).
5. Soil disturbance in the form of subsoil compaction and topsoil layering did not significantly alter the amounts of runoff water, the amounts of nitrogen and phosphorus in the runoff water, or the amount of nitrogen leached.

1995 and 1996

The treatments during this 2-year period were selected to show how the amounts of runoff water and nutrient losses were affected by:

1. Lawn fertilization — none vs. 4 lb nitrogen per year.
2. Type of fertilizer — natural organic vs. synthetic.
3. Clipping management — mulch mowing vs. clipping removal.

Data collected from this 2-year period showed that:

1. The amount of runoff water was 1.32 inches per year and 72% came from frozen soil — almost the same as in 1993 and 1994.
2. Nitrogen loss in the runoff water averaged 0.29 pound per acre per year. Runoff water from frozen soil contained 72% of the total nitrogen.
3. Phosphorus loss in the runoff water averaged 0.30 pound per acre per year and 80.6% of this came from frozen soil.
4. The amount of leachate totaled 11.80 inches per year and contained, on average, 2.6 pounds nitrogen per acre. Nitrate-nitrogen concentration averaged 1.60 ppm.
5. Not fertilizing the lawn for 2 years caused the turf to thin out to the point where the amount of runoff water was 30% more than where fertilizer was applied.
6. Nitrogen and phosphorus in the runoff water from the unfertilized turf exceeded that from the fertilized turf by 24% for nitrogen and 41% for phosphorus.
7. The amounts of nitrogen and phosphorus in runoff water and nitrogen in leachate were the same whether the fertilizer applied was natural organic or synthetic.
8. As compared to where clippings were removed, mulch mowing slightly decreased the amount of runoff water but increased by 2.1 pounds per acre the amount of nitrate-nitrogen in the leachate.

1997 and 1998

This 2-year period was devoted to testing the effect of form of nitrogen in lawn fertilizer on nitrogen in runoff water and leachate. The form of nitrogen ranged from urea, which is 100% water-soluble to several forms of slow-release nitrogen to 100% natural organic nitrogen. Observations during this 2-year period were:

1. The amount of runoff water per year was 1.24 inches, or 0.08 to 0.11 inch less than in the four previous years, but the portion from frozen soil was 95.2%, or more than 20% greater than in 1993 through 1996.
2. With 20% more of the runoff water coming from frozen soil, the amount of nitrogen it contained increased 125% to 0.6 pound per acre per year, of which 94.3% was from frozen soil.
3. The amount of phosphorus in the runoff water also increased — from an average of 0.31 to 0.45 pound per acre per year and 96% of this came from frozen soil.
4. Leachate for this period averaged 14.99 inches. The leachate contained 1.85 pounds nitrogen per acre per year and the nitrate-nitrogen concentration averaged 1.60 ppm.
5. The amounts of nitrogen and phosphorus detected in the runoff water and leachate were not influenced by the form of nitrogen applied.
6. The amount of phosphorus in the runoff water did not vary among the fertilizer treatments even though the amount of phosphorus applied ranged from 0 to 25 pounds per acre per year.

SUMMARY

Six years of data were collected from a Kentucky bluegrass lawn established on silt loam soil disturbed in the same

manner as in an urban area. The site had a 5.5% slope. The amount of runoff water collected averaged 1.30 inches per year. This amounts to 4.2 % of the long-term annual average precipitation in the area of 30.9 inches. On average, 80.1% of the annual runoff occurred when the soil was frozen.

Leachate collected averaged 14.94 inches per year and accounted for 48.3% of average annual precipitation. For the 6-year period, 11.5 times more water was collected as leachate than as runoff water.

Annual losses of nitrogen and phosphorus in the runoff water averaged 0.33 and 0.36 pound per acre, respectively. Seventy-five percent of this nitrogen and 81% of this phosphorus was in runoff collected when the soil was frozen.

Leachate nitrogen averaged 2.25 pounds per acre per year, which is nearly six times the amount of nitrogen lost in the runoff water. All but a trace of nitrogen in the leachate was in the form of nitrate. Leachate nitrate-nitrogen concentrations annually averaged 1.92 ppm for the 6-year period.

DISCUSSION

To fully comprehend and appreciate the results of this 6-year study, they have to be placed in some kind of context. Watersheds that supply the phosphorus associated with lake eutrophication and contamination of groundwater with nitrate typically encompass rural as well as urban areas. Therefore, there is logic in comparing the nitrogen and phosphorus losses observed in this study to losses from agricultural land.

Several long-term research projects that have been conducted in the Midwest provide a comprehensive perspective of what can be expected in terms of runoff water, erosion, and nutrient losses from agricultural land. These studies have shown that:

1. The amounts of runoff water from farm fields during the growing season typically range from about 5 inches for a row crop to 2 inches for hay or pasture. I measured an average of 1.3 inches of runoff water per year, with only about 0.25 inch being lost when the soil was not frozen.
2. Annual sediment loss, if controlled with conservation practices, ranges from 5 to 7 tons per acre for row crops to as little as 0.1 ton for pasture. In the present study, sediment losses were too low to measure accurately, but other researchers have recorded losses that average about 0.005 ton per acre.
3. Nitrogen losses in runoff water from cropland may range anywhere from 4 to 20 pounds per acre per season, while phosphorus losses average about 10 pounds per acre. Comparable numbers from my study were 0.38 pound of nitrogen and 0.36 pound of phosphorus for the entire year. Losses from non-frozen soil were in the range of 0.1 pound nitrogen and 0.07 pound phosphorus per acre.
4. The amount of nitrogen leached from agronomic crops has been reported to be in the range of 21 to 67 pounds per acre per season. This is in sharp contract with the 6-year average of 2.25 pounds nitrogen per acre per year that I measured.
5. Nitrate-nitrogen concentrations averaged over the season from agronomic crops have been reported to be in the range of 12 to 20 ppm. My average concentration was 1.9 ppm of nitrate-nitrogen. Other researchers have found even lower values for turf.

From these numbers it appears that rationally managed turfgrass, when compared to agronomic crops, yields only about 5% as much runoff water during the growing season, contributes less than 1% as much sediment, nitrogen and phosphorus in the runoff water, allows only 10% as much nitrogen to leach, and maintains leachate nitrate-nitrogen concentrations that are but 15% or so those for agronomic crops.

I observed that 75 to 80% of the nitrogen and phosphorus in runoff water exited the Kentucky bluegrass when the soil was frozen. The question raised by this observation is the source of this nitrogen and phosphorus. There are multiple studies that clearly indicate that this nitrogen and phosphorus are being leached out of the frozen, desiccated turfgrass.

The same holds true for all other types of vegetation in the landscape and explains why phosphorus concentrations in storm sewer water show a minor peak at the time of leaf fall and a major peak in snow melt. It also explains why the ratio of nitrogen to phosphorus I measured in the runoff water was nearly 1:1 and not even close to the 14:1 ratio of nitrogen to phosphorus in the fertilizer applied over the 6 years of the study.

CONCLUSIONS

The public perception that lawns and lawn fertilizers are major contributors of nitrogen and phosphorus to lakes, streams, and groundwater is false. Their contributions are overshadowed by those from agricultural lands.

The notion that banning of phosphate application on home lawns will significantly reduce lake eutrophication is likewise false. With 6 years of data in hand, I examined the relationship between runoff losses of phosphorus and the rates of fertilizer phosphate applied. For all practical purposes, there was no relationship. As long as we maintain green landscapes, there will be a relatively small but fairly consistent release of phosphorus into urban surface water from that vegetation regardless of whether fertilizer is applied or not. Failure to maintain quality turf through fertilization carries the risk of increasing amounts of runoff in urban environments.

These conclusions should by no means serve as a green light to indiscriminately and irresponsibly apply fertilizer on home lawns. It is irresponsible to apply more nitrogen than required to maintain an attractive lawn and to apply phosphate and potash when they are not needed. It is even more irresponsible not to clean up fertilizer misapplied to impervious surfaces.

RECEIVED SEP 2 1 2007

Ducks Unlimited Canada
CANADA'S CONSERVATION COMPANY

September 21, 2007

Mr. Dwight Williamson
Water Quality Management Section
Manitoba Water Stewardship
Suite 160 -123 Main St
Winnipeg, MB R3C1A5

Dear Dwight,

Ducks Unlimited Canada (DUC) appreciates the opportunity afforded citizens and stakeholder groups to comment through the public consultation process related to "Proposed Approaches to Reducing Nutrient Contributions From Urban and Rural Residential Sources", and DUC would like to take this opportunity to provide a few perspectives regarding the related materials and messaging.

In general, the background document prepared for the public consultation meeting was well done. Descriptions of the problems, impacts of nutrients and other initiatives underway provide good background material and serve to enhance public awareness and encourage support. Transparently explaining the nature and context of the problem is the first step in moving toward appropriate solutions.

The sections on 'what was being done in other jurisdictions' and 'what the province intends to do' were also particularly useful. In DUC's view, these sections provide a meaningful and accountable starting point for public input into proposed regulations. We have gone on record supporting a strong regulatory framework as a backdrop to other policy instruments (such as incentives), as a means to encourage and enhance wetland conservation. It is realistic to expect that the proposed approaches to the residential use of fertilizers and household cleaning products would elicit reasonable behavioural change and compliance if coupled with an aggressive education strategy - which was also appropriately identified in the discussion documents.

As identified in these documents, **clear communication** of the impacts of traditional approaches and the need for modification in practices is absolutely essential in the process to effect widespread change in behaviour. It is on that point that DUC has a concern with a comment in "Manitoba's Water Protection Handbook: Everyone's Responsibility"

DUC is concerned that the sentence on page 6: "Fortunately, recent conservation efforts and increasing awareness of the value of wetlands has led to the maintenance and enhancement of many wetlands in Manitoba." could be misinterpreted by the public.

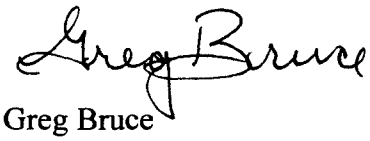
In the section "Manitoba's wetlands – A precious resource", the many benefits and functions of wetlands are aptly described. DUC also appreciates that wetland loss rates are accurately noted throughout this section. However, the final sentence, as noted above, may leave the majority of the readers with the impression that we are on the road to recovery with respect to wetland loss - **diluting the importance of a real urgency on the landscape.**

Although DUC agrees that progress has been made and appreciates the acknowledgment of the efforts of the North American Waterfowl Management partners, this final statement is misleading. Wetland loss and degradation continues at startling rates facilitated in part by current government policies. Drainage licensing protocols allow for the complete destruction of temporary and seasonal wetlands. In addition, it is common licensing procedure to allow for drainage activities that control surcharge which result in the degradation of semi-permanent and permanent wetlands as well as lakes. Such wetland degradation activities significantly erode the ability of wetlands to function as natural filters and diminish the aforementioned ecological functions of wetlands. Drainage outlets also serve to convert non-contributing portions of the watershed to a contributing portion, hence increasing downstream flows and **facilitating movement of nutrients** downstream.

DUC believes it is critically important to openly and transparently discuss the problems of wetland loss and degradation with the public. As the province has admirably done with wastewater treatment, manure management and most recently, with nutrients from urban and rural residential areas, an accurate and honest assessment of the problem is the first step in moving toward the difficult tasks of abatement and mitigation.

The handbook is an excellent educational resource and DUC recognizes that it was not meant to deal with the wetland loss issue or wetland policies in particular. However, the messaging is symptomatic of the urgent need to more directly address the issues related to wetland loss and degradation. DUC felt we should respond so future messaging can be clarified. The sooner we openly embrace the need for change the sooner we can move toward workable and resolute solutions that will benefit all Manitobans.

Sincerely,



Greg Bruce
Head, Industry and Government Relations
Ducks Unlimited Canada
Bus: (204) 467-3301
Cell: (204) 799-5718
Email: g_bruce@ducks.ca

cc Bob Grant
Steve Topping
Don Norquay

Armstrong, Nicole (WSD)

From: Lindy Clubb [lindy@frozen.ca]
Sent: September 18, 2007 2:47 PM
To: +WPG1218 -Water Quality (WSD); Al Rogosin; Dave K.; Daryl N.; Cara Gillard; Ruth Pryzner
Subject: public responses to the Open Houses on Nutrient Management

Reducing Nutrients
Manitoba Water Stewardship
Water Quality Management Section
Suite 160, 123 Main Street
Winnipeg MB R3C 1A5

<!--[if !supportEmptyParas]--> <!--[endif]-->

Dear Sirs,

In response to the opportunity for Manitobans to provide comments on emerging ways of reducing nutrients to our water, I recommend a combination of regulations and education.

Regulations and legislation are necessary since volunteer and individual efforts haven't been enough to stem the tide of nutrients entering our communal water supplies. The eutrophication of Lake Winnipeg is a good example of this. Many small decisions made by land owners, home owners, businesses and municipalities contribute to our water's woes, and regulations may bring about benefits in time for our water to survive.

Education is a wonderful investment to accompany regulations, and it has made a difference. But, education offers a choice that many people haven't taken, to reduce or eliminate the use of phosphorus containing substances for households, lawns, agriculture and industry.

Our government can send a strong message by joining forces with our federal counterparts to eliminate the manufacturing of products containing phosphates. This seems the best way to go about cleaning up our water – through means of prevention. If we can do it with laundry detergents, why not with dishwasher, dishwashing, cleaning and soap products? This must include personal products such as shampoos. Phosphate free products perform well and are as inexpensive as regular products – we have used them for years in our home, at the field station we operate, and in our second homes in the country and at the lake.

About prevention , we are, as a province, are opening up an additional 1000 cottage lots by or close to water. Homeowners and cottagers should be required, through the leases on the lots they receive, to eliminate or substantially reduce the use of household products that contain phosphorus, to retain buffers on their shorelines, and to stop using cosmetic lawn products. In addition, the installation of holding tanks may be regulated, but there is a huge gap with maintenance of these tanks. Holding tanks should be inspected. Municipalities can co-ordinate the timely emptying of tanks and keep track of when they need to be replaced, and contract only licensed, conscientious companies to empty the contents. Lagoons for receiving the sewage and graywater must be of adequate size and appropriate for our climate. Urban sewage treatment must require nutrient removal, and stormwater controls and treatment are essential. Stormwater treatment and erosion control can and must be budgeted for and practised everywhere, in lakeshore communities like Gimli and in cities like Brandon and Winnipeg that have rivers running through them. Minneapolis has great examples to follow from erosion control and stormwater control . They use incentives of property tax reductions for urban stormwater control and it has been successful. They use regulations and fines for effective erosion control on all works by water and highways and construction projects. If Manitoba is looking to Minnesota for examples to follow in legislating phosphorus controls, incorporate stormwater and erosion control practices as a solution to the problem.

Another threat to water quality is the growing use of unnecessary anti-bacterial agents in household products and manufactured items. They contribute to the proliferation of antibiotic resistant bacteria in the environment, a matter of current grave medical and scientific concern. Studies have shown these products are no more useful than soap for eliminating bacteria. The products should be removed from commercial sale and the advertising budgets for companies like Dow that manufacture them can go towards educating the public on what not to put down their drains.

The practice of spreading hog waste for nutrients on our depleted soils is also a cause for concern. Intensive livestock operations employ antibiotics that build up in our soils and water. Hogs, in particular, produce more waste than humans, and we have millions of them in our province. We are now documenting the entry of both nutrients and antibiotics (and pharmaceuticals) from human and animal waste into our water. Sewage treatment is a solution to both nutrient and contaminants that find their way into the water that leaves our homes , businesses and farms. The Village of Dunottar is a progressive community that is experimenting with sewage treatment. We appreciate the investment by the province in worthwhile initiatives like this. Please mandate other municipalities to reform their sewage practices.

If we can put men on the moon we should be able to devise ways and means to prevent water's pollution from nutrients and other by - products of our society. If we have the ways and means they need to be acted upon. Thank you for your endeavors to help in that regard, and for consulting the public. Of course, the public is the problem and that is a large factor to consider with strategies to solve the problem. We live with regulations and education as part of our society, and these methods are appropriate and familiar. Water pollution is not appropriate or familiar. So, we are overdue to regulate, offer incentives and use education to turn this tide of nutrients from overload to manageable.

<!--[if !supportEmptyParas]--> <!--[endif]-->

Sincerely,

Original signed by

Lindy Clubb

assistant executive director, Mixedwood Forest Society
910 Dorchester Avenue (Unit 4)
Winnipeg, Manitoba
R3M 0R8
204 475-9608

Armstrong, Nicole (WSD)

From: Lindy Clubb [lindy@frozen.ca]
Sent: September 25, 2007 8:46 PM
To: +WPG1218 -Water Quality (WSD)
Subject: open houses

Manitoba Water Stewardship
Water Quality Management Section
Suite 160, 123 Main Street
Winnipeg MB R3C 1A5

<!--[if !supportEmptyParas]--> <!--[endif]-->

Dear Sirs,

In response to the opportunity for Manitobans to provide comments on emerging ways of reducing nutrients to our water, I recommend a combination of regulations and education.

Regulations and legislation are necessary since volunteer and individual efforts haven't been enough to stem the tide of nutrients entering our communal water supplies. The eutrophication of Lake Winnipeg is a good example of this. Many small decisions made by land owners, home owners, businesses and municipalities contribute to our water's woes, and regulations will bring about benefits in time for our water to survive.

Education is a wonderful investment to accompany regulations, and it has made a difference. But, education offers a choice that many people haven't taken, to reduce or eliminate the use of phosphorus containing substances for households, lawns, agriculture and industry.

Our government can send a strong message by joining forces with our federal counterparts to eliminate the manufacturing of products containing phosphates. This seems the best way to go about cleaning up our water – through means of prevention. If we can do it with laundry detergents, why not with dishwasher, dishwashing, cleaning and soap products? This must include personal products such as shampoos. Phosphate free products perform well and are as inexpensive as regular products – we have used them for years in our home, at the field station we operate, and in our second homes in the country and at the lake.

About prevention , we are, as a province, are opening up an additional 1000 cottage lots by or close to water. Homeowners and cottagers should be required, through the leases on the lots they receive, to eliminate or substantially reduce the use of household products that contain phosphorus, to retain buffers on their shorelines, and to stop using cosmetic lawn products. In addition, the installation of holding tanks may be regulated, but there is a huge gap with maintenance of these tanks. Holding tanks should be inspected. Municipalities can co-ordinate the timely emptying of tanks and keep track of when they need to be replaced, and contract only licensed, conscientious companies to empty the contents. Lagoons for receiving the sewage and graywater must be of adequate size and appropriate for our climate. Urban sewage treatment must require nutrient removal. Stormwater controls and treatment are essential. Stormwater treatment and erosion control can and must be budgeted for and practised everywhere, in lakeshore communities like Gimli and in cities like Brandon and Winnipeg that have rivers running through them. Minneapolis has great examples to follow from erosion control and stormwater control . They use incentives of property tax reductions for urban stormwater control and it has been successful. They use regulations and fines for effective erosion control on all works by water and highways and construction projects. If Manitoba is looking to Minnesota for examples to follow in legislating phosphorus controls, incorporate stormwater and erosion control practices as a solution to the problem.

Another factor for water lies in the proliferation of unnecessary anti-bacterial agents in household products and furnishings. Studies have shown these products are no more useful than soap for eliminating bacteria, but they cause resistance and mutation in the natural world. We are documenting the entry of both nutrients and antibiotics (and pharmaceuticals) from human and animal sewage into our water, an issue as urgent to address as the phosphorus and pollution additions to water.

If we can put men on the moon we should be able to devise ways and means to prevent water's pollution from nutrients and other by - products of our society. Thank you for your endeavors to help in that regard, and for consulting the public. Of course, the public is the problem and that is a large factor to consider with strategies to solve the problem. We live with regulations and education as part of our society, and these methods are appropriate and familiar. Water pollution is not appropriate or familiar. So, we must begin with regulations and incentives and education to turn the tide of nutrient overloads.

<!--[if !supportEmptyParas]--> <!--[endif]-->

Sincerely,

Original signed by

Lindy Clubb

910 Dorchester Avenue (Unit 4)
Winnipeg, Manitoba
R3M 0R8
475-9608

Armstrong, Nicole (WSD)

From: Tim [byerses@escape.ca]
Sent: September 14, 2007 6:39 PM
To: +WPG1218 -Water Quality (WSD)
Subject: nitrate toxicity paper

Greetings, Nicole & Dave.

As promised, here is information on the nitrate toxicity testing done by Rescan that was commissioned by the BHP-Billiton diamond mine company. Toxicity testing of nitrate on lake trout & whitefish has been published in Journal of Environmental Toxicology

A summary follows:

"The acute and chronic toxicity of the nitrate ion (NO3-) to the embryos, alevins, and swim-up fry of lake trout (*Salvelinus namaycush*) and lake whitefish(*Coregonus clupeaformis*) were tested in laboratory aquaria. The acute (96-h) lethal concentration 50% (LC50) for swim up fry was 1,121 mg NO3-N/L for lake trout and 1,903 mg NO3-N/L for lake whitefish. The chronic (~130 - 150-d) LC50s for the embryo to swim-up fry were 190 and 64 mg NO3-N/L, respectively. Sublethal effects on development timing and fry body size were observed at concentrations of 6.25 and 25 mg NO3-N/L, respectively, in the chronic tests. These results confirm that the Canadian nitrate water quality guideline of 2.9 mg NO3-N/L, which was derived from chronic tests on a temperate-zone amphibian, is applicable to the early life stages of two species of Arctic fish. However, it does not support the use of the guideline for acute exposures to early life stages of salmonid fish, or for acute or chronic exposures to adult fish, which are known to be relatively insensitive to nitrate."

Tim Byers

BYERS ENVIRONMENTAL STUDIES
Box 1049
Teulon, Manitoba
R0C 3B0
Tel/FAX (204)886-4642

35

Armstrong, Nicole (WSD)

From: Linda Grayston [lgrayston@shaw.ca]
Sent: September 13, 2007 10:10 PM
To: +WPG1218 -Water Quality (WSD)
Subject: Reducing Nutrients

Hello, I have read your article on "proposed approaches to reducing nutrients" and would like to go on record as encouraging whatever regulations it takes to reduce the phosphate levels entering our lake. This is an major problem facing Lake Winnipeg and unless we act now with firm regulations and quick compliance we will loose this precious commodity.

Linda Grayston

36

Armstrong, Nicole (WSD)

From: Ken Storie [bkstorie@mts.net]
Sent: September 13, 2007 8:34 AM
To: +WPG1218 -Water Quality (WSD)
Subject: Lake Winnipeg

We submit the following to the Water Stewardship Committee:

Saving Lake Winnipeg is going to involve real costs, and real sacrifices. Real, but not prohibitive. As citizens we need to accept this and move on. This is not just about the lake. The very things we need to do to save Lake Winnipeg will also help to make our water supply safer and more secure in general.

The government should be:

1. Instituting an immediate and effectively-enforced ban on the cosmetic use of phosphorus-laden fertilizers and cleaning supplies such as dishwasher detergents .
2. Imposing real restrictions on the use of fertilizers near watersheds.
3. Instituting real restrictions on the pasturing of livestock along waterways.
4. Implementing and enforcing realistic restrictions on phosphates from both municipal sewage and residential lakeside residences.
5. Imposing realistic guidelines for fertilizer use and and stiff penalties for the excess use of fertilizers in all aspects of agriculture.
6. Beginning to offering real incentives and support for environment- friendly alternative agriculture - aimed at both producers and consumers.

For a start these actions would demonstrate that our government is serious about confronting the challenge of saving both Lake Winnipeg and protecting our water supply throughout the province.

Bev & Ken Storie
Gimli, MB

37

Armstrong, Nicole (WSD)

From: marilyn burdiak [burdiak@mts.net]
Sent: September 11, 2007 12:21 PM
To: +WPG1218 -Water Quality (WSD)
Subject: Phosphates and cleaning without chemcials
Attachments: Dishwashing Liquid.doc

Hi, Nichole (hopefully that is the correct spelling)

Thank you so much for returning my call regarding the Water Stewardship meetings at the Holiday Airport Inn tomorrow.

The water quality issue is of great interest to me as we have a cottage in the Interlake area and have seen the destruction over the years. We have not been in the water for about 4 years, but walk down to the shore several times when we are there. We would never allow our little ones to swim in these waters as very concerned what they may pick up which could effect their health.

It is heart breaking to see what use to be a beautiful shore and inviting swimming waters turn into green algae and black smut that washes in with the tide. Not to mention all the "poop" left behind by the gulls.

We had some standing water tested from our property and the tests results came back +200. We said impossible. Conservation said it could be the result of the birds - well it had to be a very LARGE BIRD. We are going to redo the test as you always have to leave room for human error. Our property is not on water front so that isn't the connection to the tests results.

I have spoken to Jim Rondeau and thanked the government for their stand on phosphorus and how I always implement the government's stand when I do my Norwex demonstrations. This has greatly improved my sales which is good, but better is the education to people on the damage caused by using phosphorus in their products.

Judy Wasyl...leis has requested an information package from me and she is looking into something in the future. She did a showing of the Inconvenient Truth with Q & A, but is looking into a presentation regarding the environment.

I've attached the information that you requested a copy of this morning regarding Norwex Products that are environmentally friendly and phosphate free.

Thank you to you for all that you are doing to educate Manitobans on the damage of using phosphates and how we all can do our part by reducing the chemicals that we use daily.

In appreciation, Marilyn Burdiak Norwex Consultant (204) 888-2677

Dishwashing Liquid

The Norwex Dishwashing Liquid is phosphate-free, biodegradable and highly concentrated, less soap is required to effectively clean a sink full of dishes. The thick, rich formula is tough on grease, yet still soft on your hands. Ideal for sensitive skin.

For maximum suds/bubbles add the Norwex Dishwashing Liquid to the water and fill the sink prior to adding dishes or pot/pans. The grease fighting agent remains strong long after the bubbles have disappeared.

The Norwex Dishwashing Liquid is also very effective on removing stains and grease from fabric and clothing. Ideal for use in areas with hard water.

This pleasantly scented product is also gentle on hands and may be used as a cost effective hand soap.

Size: 500 ml Price: $5.50*

For more information contact:

Marilyn Burdiak – (204) 888-2677
email: burdiak@mts.net

Glenda Bates (204) 942-0235
email:gbates2001@shaw.ca

*plus s/h and gst/pst

Ultra Power Plus Laundry Detergent

The Ultra Power Plus Laundry Detergent is beneficial to the environment and to our budget as the cost per load is considerably less. When washing a full load of laundry: only two tablespoons of Ultra Plus Laundry Detergent is required. The Ultra Plus Laundry Detergent can be used in front-loading washing machines, only one teaspoon is required.

It is also biodegradable, has optical brighteners, and color enhances. The Ultra Power Plus detergent does not contain fillers, which cause the excess wear, fading, and pilling on clothes. Filler also clogs and plugs the drains on washing machines.

The Ultra Power Plus detergent is scent free, minimizing skin irritations. Ideal for allergy sufferers and infants.

Reduce the amount of Ultra Plus Laundry Detergent by 50-70% when used with the Dishwasher Magnetic Ball, only one tablespoon of detergent for a large load of laundry is required. Fabric softener is also no longer needed.

One 2kg. bag will provide 60-70 loads, or when used with the Magnetic Ball,120-140 loads. Price $22.99*

For more information contact:

Marilyn Burdiak (204) 888-2677 or email: burdiak@mts.net

Glenda Bates (204) 942-0235 or email: gbates2001@shaw.ca

*plus s/h, gst/pst

Armstrong, Nicole (WSD)

From: Clyde Graham [cgraham@cfi.ca]
Sent: September 21, 2007 4:13 PM
To: +WPG1218 -Water Quality (WSD)
Cc: Williamson, Dwight (WSD); 'Doug Beever'; 'Roger Larson'
Subject: Canadian Fertilizer Institute brief
Attachments: CFI Brief to Manitoba Water Stewardship-sept21-final.doc

We reserve the right to amend our brief as new information becomes available.

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CANADIAN FERTILIZER INSTITUTE
INSTITUT CANADIEN DES ENGRAIS

Sept. 21, 2007

Reducing Nutrients
Manitoba Water Stewardship
Water Quality Management Section
Suite 160, 123 Main Street
Winnipeg, Manitoba
R3C 1A5

Re: Proposed approaches to Reducing Nutrient Contributions from urban and rural residential sources: Fertilizer Application/Household Cleaning Products

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Introduction

The Canadian Fertilizer Institute (CFI) welcomes the opportunity to comment on the proposals regarding phosphorus fertilizer.

CFI is an industry association representing manufacturers, wholesale and retail distributors of nitrogen, phosphate and potash fertilizers. Our industry employs 12,000 Canadians and contributes $7 billion annually to Canada's economy. Our products contribute to the supply of safe, nutritious food in Canada and around the world. Fertilizer also helps keep our cities green.

Manitoba Water Stewardship Proposal

Manitoba Water Stewardship is proposing to restrict the application of "cosmetic" fertilizers to lawns in urban and rural residential areas. Fertilizers containing phosphorus could only be applied to lawns for cosmetic purposes within the first two years of establishment.

Restrictions would come into effect in January 2009. Manitoba would work closely with the local retail sector to ensure that a range of phosphorus-free fertilizers are offered for sale in urban and rural residential areas.

Golf courses and driving ranges that apply nutrients would also be required to submit a nutrient management plan explaining how nutrients would be managed at the facility to ensure water quality protection.

Specific Comments on the Proposal Text

- *"Fertilizers are applied to lawns, golf courses and parks for cosmetic purposes to maintain a thick growth of rich, green grass."*

The use of the term "cosmetic" implies that the application of fertilizer serves no purpose other than

appearance. Nutrients are essential for plant life, including grass. Healthy lawns around homes stabilize the soil, prevent erosion, keep yards cool in the summer and provide safe play areas for children. A well-fertilized lawn discourages weed growth, reducing the need for pesticides.

Fertilizer plays a critical role in maintaining the turf on golf courses, sports fields, playgrounds and urban parks and providing safe areas for recreation.

- *"Many of Manitoba's soils have an abundant supply of natural phosphorus."*

While many Prairie soils are often high in fixed phosphates – calcareous soils – they are not high in available phosphorus that can be utilized by plants.

- *"Many fertilizers are applied for cosmetic purposes in larger amounts than can be used by growing grass and plants."*

While some homeowners may over-use fertilizers, many lawns have been depleted of nutrients leading to bare patches and weed growth. New York Sate completed a turfgrass management survey recently. Amounts spent on fertilizer indicate that on average, residential lawns are fertilized at rates far below recommended levels. http://www.nass.usda.gov/Statistics_by_State/New_York/Publications/Special_Surveys/Turfgrass2003/Turfbook04.pdf).

- *"Manitoba Water Stewardship is proposing to follow a similar approach to Minnesota for restricting the application of cosmetic fertilizers to lawns in urban and rural residential areas."*

The text makes no mention of manure, compost and other sources of fertilizer that are applied in urban areas. There is no difference between the phosphorus from these sources and the phosphorus in mineral phosphorus fertilizer. Some manures are high in phosphorus content.

- "With rain and snowmelt, excess nutrients can wash away into ditches and storm drains that lead directly to rivers and lakes."

It is well established that phosphorus quickly binds to soil and does not generally "runoff". Erosion of soil containing phosphorus from natural and fertilizer sources, however, is a contributor to phosphorus loading in lakes and rivers. Research by Cornell University indicates that fertilization of turf can in some cases reduce losses of phosphorus in runoff by preventing erosion. http://www.ipni.net/ppiweb/bcrops.nsf/$webindex/B76058DCABCAEA75852572760079989/$file/07-1p26.pdf).

Stewardship Approach

The Canadian Fertilizer Institute believes that the nutrients contained in fertilizer, compost and manure have to be used with care to protect our water and air.

All nutrients used in agriculture, horticulture and home gardening need to be applied responsibly. That's why the Canadian Fertilizer Institute has developed the Right Product@Right Rate, Right Time, Right Place™ system. http://www.cfi.ca/files/publications/CFI_Path_to_Sustainability_broch_ver10_071905_single_page.pdf

Although the Right Product@Right Rate, Right Time, Right Place™ system was designed for use in agriculture, the basic principles apply to anyone using fertilizer, manure or compost. For a homeowner, getting it right can be made simple.

Right Product

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Manure or compost might be the best choice for a garden that needs added organic matter. A new lawn that needs a quick start might benefit from a commercial fertilizer.

Rate Right
Ideally, a homeowner would send soil samples to a laboratory to determine that the exact nutrient needs, but that generally isn't practical. Homeowners can use a trained lawn care professional to apply the right fertilizer mix. For do-it-yourselfers, following the science-based, government approved directions of the fertilizer package will provide good results for the lawn and the environment.

Right Time
There are some simple guidelines for timing application. Fertilizer shouldn't be applied when the ground is frozen or just before a heavy rain is expected, for example.

Right Place
Keeping fertilizer on the grass and cleaning up spills on driveways or sidewalks is important. Homeowners may want to leave a small strip unfertilized on the edge of the lawn. Special care needs to be taken when fertilizing slopes or gullies.

Basic Principles

CFI believes that voluntary Nutrient Management programs based on sound science, expert advice and public education are the best approach.

Applying too much fertilizer is simply wasteful and can harm the soil or be lost to the environment. At the same time, too little fertilizer can leave plants and crops stunted for a lack of nutrients. But used in the right way, fertilizers keep lawns, parks, sports, fields and golf courses green and healthy.

The Canadian Fertilizer Institute is working with companies that supply lawn and garden fertilizers to communicate the importance of responsible nutrient use. The fertilizer industry can do more to get its message out.

The effective use of fertilizers for lawn and garden care needs to be proactively communicated to the media and urban consumers. Municipal politicians and officials need the facts about fertilizers and ways that homeowners can use fertilizer while protecting our lakes and rivers. Simple tips such as getting gardeners to carefully follow the directions on fertilizer bags will reduce the impact on the environment.

CFI Recommendations

- The proposed exemption for golf courses and driving ranges should be extended to sports fields, public parks, cemeteries, playgrounds and other areas that are normally fertilized by trained professionals. In addition, homeowners using trained lawn care applicators should be exempt.

- Manitoba Water Stewardship should work in partnership with the fertilizer/lawn care industry and other stakeholders to improve homeowner education and communication about fertilizer and its application.

- CFI is proposing that homeowners applying fertilizer on established lawns should only be restricted to the use of "low" phosphorus fertilizers. The current proposal would restrict homeowners to the use of "zero" phosphate fertilizers for lawns that have been established for more than two years. CFI believes that a zero phosphate restriction is not based on science and would not be sustainable over time.

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- Establish a technical working group including government and industry to establish a science-based standard for a low phosphate fertilizer.

Low Phosphorus Fertilizer

In the United States, the Association of American Plant Food Control Officials, which regulates fertilizer in U.S. states, is developing a standard for low phosphorus lawn fertilizer. Under the proposal, a low phosphorus fertilizer would have directions for use that would mean a maximum application rate of 0.25 lbs. of phosphorus (P2O5) per 1,000 square feet of grass.

Others believe this level may in fact be too high for established lawns and a "low phosphorus" standard more in the range of 0.12 to 0.20 pounds of phosphorus (P2O5) per 1,000 square feet of lawn. This would equate to 24-4-16 fertilizer.

CFI is willing to work with Manitoba Water Stewardship to establish the appropriate standard for low phosphorus fertilizer. We would also be willing to work with the lawn care industry and the Canadian Food Inspection Agency (Fertilizer Section) to establish this as a national standard.

The Manitoba government has recognized that phosphorus is required during the first two years of planting a lawn and application of phosphorus on new lawns is exempt. A typical "starter" fertilizer recommended for a new lawn would have an application rate of 1.0 lbs per 1,000 square feet, or label of 16-32-6. Setting a low-phosphate standard would assist in preventing starter fertilizers from being used on established lawns.

Conclusion

CFI supports voluntary stewardship programs for its products. The Manitoba Water Stewardship proposal regarding phosphorus in fertilizer need to be practical and science based. We believe that our recommendations would result in a workable regulatory system that would benefit the environment and ensure that the Manitoba's cities and towns maintain healthy green spaces.

GS

Armstrong, Nicole (WSD)

From: Lynn Sinclair [lynn.sinclair@gmail.com]
Sent: September 21, 2007 2:06 PM
To: +WPG1218 -Water Quality (WSD)
Subject: Proposed approaches to Reducing Nutrients

Found your booklet to be very informative, plus I found out some things I didn't know. Good start!

L. Sinclair

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Armstrong, Nicole (WSD)

From: Chera Jelley [JelleyC@ccspa.org]
Sent: September 21, 2007 12:16 PM
To: +WPG1218 -Water Quality (WSD)
Subject: CCSPA comments on Reducing Nutrient Contributions from Urban and Rural Residential Sources
Attachments: Comments on Manitoba Report Reducing Nutrient Contributions_FINAL_September 21 2007.pdf

To Whom It May Concern:

Please find attached, comments from the Canadian Consumer Specialty Products Association in regards to the publication, *Reducing Nutrient Contributions from Urban and Rural Residential Sources*. If you have any question or concerns, please do not hesitate to contact us.

Sincerely,

Chera Jelley

Chera Jelley
Director, Policy
Canadian Consumer Specialty Products Association (CCSPA)
130 Albert Street, Suite 800
Ottawa, ON K1P 5G4
Tel: (613) 232-6616 ext. 14
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www.healthycleaning101.org

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CCSPA CANADIAN CONSUMER SPECIALTY PRODUCTS ASSOCIATION®
ACPCS L'ASSOCIATION CANADIENNE DE PRODUITS DE CONSOMMATION SPECIALISÉS®

September 21, 2007

Reducing Nutrients
Manitoba Water Stewardship
Water Quality Management Section
Suite 160, 123 Main Street
Winnipeg, MB R3C 1A5

Email: waterquality@gov.mb.ca

To Whom It May Concern:

RE: Comments on the Proposed Approaches to Reducing Nutrient Contributions from Urban and Rural Residential Sources

The Canadian Consumer Specialty Products Association (CCSPA) is pleased to provide comments to the Ministry of Manitoba Water Stewardship on the proposed approaches to *Reducing Nutrient Contributions from Urban and Rural Residential Sources.*

CCSPA is a national trade association that represents 47 member companies across Canada, collectively a $20 billion industry directly employing 12,000 people in over 100 facilities. Our companies manufacture, process, package and distribute consumer, industrial and institutional specialty products such as soaps and detergents, pest control products, aerosols, hard surface disinfectants, deodorizers and automotive chemicals. Our members make products which are directly impacted by this proposal. Our comments as are follows:

The document states, *"Household, commercial and industrial cleaning products such as automatic dishwasher detergent, liquid dish soap, personal care products and multi-purpose cleaners often contain high amounts of phosphates."* CCSPA questions the validity of this information as liquid dish soap actually contains no phosphorus. Therefore, we request the Government of Manitoba produce the evidence they are using to support the entire statement.

The document continually references "dishwasher detergents" as containing phosphorus. CCSPA recommends future documents specifically reference "automatic dishwasher detergents" and that the Government of Manitoba refrain from using general terms such as "cleaning products" when they are referring to automatic dishwasher detergents, as this is misleading and confusing.

There is a lack of information in the document with respect to the benefits of phosphorus in automatic dishwasher detergent. Phosphorus is a multi-functioning aid that breaks up food soils (dried or greasy food), provides consumers with clean dishes, ensures that no calcium-lime film remains on glasses or dishes, keeps dishwasher jets and pipes free from obstruction, and prevents excessive water usage. The document also does not mention that there are limitations with respect to alternatives widely available to the consumer.

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CCSPA would also request that clarity be provided with regard to the term "blue-green algae" in the document. Blue-green algae are, in fact, bacteria and not algae. The term is used to describe its appearance. Blue-green algae are technically known as cyanobacteria and are a phylum (or "division") of bacteria that obtains its energy through photosynthesis. Blue-green algae require several contributing factors in order to form: nutrients, shallow water, warm temperature, and areas of slow moving water. Why is this not clarified in the document? People commenting on this document need to know the facts – that the reasons why cyanobacteria blooms (blue-green algae) are in our waterways are complicated and there are many contributing factors.

Five federal government departments undertook a study on nitrogen and phosphorus, resulting in the 2001 publication, *Nutrients and their Impact on the Canadian Environment*. The report summarized key findings on this issue and detergent was not identified as a problem or a significant contributor. It was the opinion of the federal government that regulating the phosphorus content in automatic dishwasher detergents will not significantly reduce the phosphorus-loading from municipal sources. The report links the increase in nutrient overload to many phosphorus sources including both natural and human activity. In terms of human sources of nutrients to surface waters, agricultural runoff and municipal wastewater effluent were identified as the major sources. Human sewage waste is the largest source of phosphorus content in municipal wastewater at 53%; and within that wastewater, automatic dishwasher detergents was only 7%.

During the June 12, 2007, Standing Committee on the Environment and Sustainable Development hearing, Mr. John Carey, Director General for the Water Science and Technology Directorate at Environment Canada stated:

> *Of that Municipal discharge contribution, about 7% of it would be coming from dishwasher powders. That means that of the total discharge to the Canadian environment based on our numbers and that report; just under 1% of it would be coming for dishwasher powders.*
>
> *That was our 1996 numbers. Dr. Watson actually had some stats just with respect to dishwashers, which indicate that it's probably gone up by 50% since then. So if nothing else changed, it would now be 1.5% of the problem.*

In the 1994 *Canadian Environmental Protection Act* Review and in the 1995 Standing Committee of the Environment and Stainable Development's Report, concern was expressed during the review about the issue of algae, believed then to be "primarily from fertilizers". The Committee recommended that the government develop recommendations to support phosphorus restrictions for automatic dishwasher detergents and cleaning products. In chapter 8 of the 1995 Government Response to the CEPA review, it specifically noted that the "singling out" of cleaning products was inappropriate:

> *We cannot commit to further regulation of phosphates in cleaning products such as automatic dishwasher detergents, or to regulation of other nutrients in other products such as water softeners and fertilizers, until we have studied to what extent nutrients from sources other than laundry detergents are causing damage to the environment.*

Further, proposal 8.11 stated:

> *The Government of Canada proposes to undertake, within the next 12 months, a comprehensive study of nutrients that enter the environment through human activities. Once we have results of that study, we will be able to determine whether or not nutrients in general are causing negative environmental effects, whether only certain nutrients as a class, are problematic, such as water, or to entire ecosystems, including wildlife.*

According to the most recent and scientifically robust report on the issue of nutrient loading to surface waters, the State of Minnesota, in its *Detailed Assessment of Phosphorus Sources to Minnesota Watersheds* (2004) study, found that the amount of phosphorus emitted to the environment from household use of automatic dishwasher detergents represented only 1.9% of total phosphorus emitted. The Minnesota report also found that runoff from pasture and cropland was the largest source of phosphorus emissions to the environment and was five times greater than automatic dishwasher detergents. Any watersheds contaminated with blue-green algae have their own unique characteristics and will need to be analyzed to determine what the major sources of nutrients are – a one-size solution will not address all issues.

The amount of phosphorus in municipal effluents is the challenge because the amount of phosphorus being discharged is set to meet provincial discharge permit levels. Provinces may have to amend their existing levels to restrict the amount of phosphorus municipalities can release. Human sewage waste is the primary phosphorus source in the influent to the wastewater facility. Municipal wastewater can be processed and treated to remove phosphorus. In a 1991 survey of municipal wastewater treatment plants, a total phosphorus removal efficiency of 94.7% was achieved when tertiary treatment of wastewater and phosphorus removal technologies was employed. If the phosphorus content of municipal effluent is to be lowered, municipalities will be required to upgrade their wastewater treatment facilities and phosphorus removal technologies. In the 1970's, the eutrophication issues that were seen in the lower Great Lakes was rectified by the reduction of phosphorus inputs. According to the 2001 Government report, this was achieved primarily by construction of new municipal wastewater treatment facilities and the adoption of phosphorus precipitation techniques in older treatment facilities.

CCSPA requests that the Government of Manitoba not move forward with a regulation to reduce the phosphorus content in automatic dishwasher detergent as this will <u>not</u> solve the blue-green algae problem and will have only a negligible impact; because it represents <u>only 1% of the contributing source</u>. To make a "real" impact on the environment, the Government of Manitoba needs to focus on the largest contributing sources - agriculture run-off and human sewage waste. CCSPA would recommend more focus be placed on upgrading wastewater treatment facilities. CCSPA would be pleased to discuss this matter further.

Sincerely,

Shannon Coombs
President

Armstrong, Nicole (WSD)

From: Amanda Le Rougetel [alerougetel@mts.net]
Sent: September 19, 2007 7:29 PM
To: +WPG1218 -Water Quality (WSD)
Subject: Comments

Hello Water Stewardship Board:

re. your publication online:
http://www.gov.mb.ca/waterstewardship/fertilizer/proposed_approaches_to_reducing_nutrients.pdf

I applaud your efforts but urge you to be much bolder on the matters of fertilizer and household cleaning products. Time is flying by and Lake Winnipeg and other bodies of water cannot afford for us to pussy foot around the urgent issue of nutrients, phosphates and water quality.

We **can** change our ways but we only **will** if legislative force is brought to bear. It is your role and responsibility to lead the way for government to move on this. Partner with other organizations to drive up public awareness of the urgency. Make it an issue we cannot avoid. That our politicians cannot avoid.

Suggesting a ban for 2009 is good, but couldn't we change our behaviours sooner? Why wait so long? Why not act **today** to save tomorrow? 2009 is many tomorrows away and, god knows, a lot of damage can be done in those tomorrows.

I am a lakeshore cottage owner who has seen the algae get worse over the less-than-a-decade that I've been going to Lake Winnipeg. Now -- today -- is the time to act, to lead, to urge EVERY one of us to change our ways.

Sincerely,
Amanda Le Rougetel
903 Palmerston Ave.
Winnipeg, MB R3G 1J7

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10/03/07

Armstrong, Nicole (WSD)

From: Mo Tipples [motipples@mts.net]
Sent: September 18, 2007 4:51 PM
To: +WPG1218 -Water Quality (WSD)
Subject: Reducing Nutrients
Attachments: Reducing Nutrients.doc

Please find attached my comments. Sorry to be so long winded, but you asked to know how we feel !

Please share my comments with Conservation if you feel they are applicable.

Mo Tipples

Reducing Nutrients.....feedback

It was very useful to come to the public session on the Nutrient Reduction proposals. The conversation with staff Nicole Armstrong and Wendy Ralley was very informative and answered many questions. The posters were excellent and I hope will be kept as a useful tool for others to use as an educational tool at their cottage areas or at AGMs!

Further thoughts:

1. Is Conservation and Stewardship working in sync on this problem?
   I asked staff if it was possible for the **Save Our Lake phosphate free product listing** to be sent out with the Water Handbook. The answer was ' No' as Government cannot be seen to favor any one source over another.

   Understood, **but can it then be sent out with the end of year Cottage 'Fees for Service' invoices by the Conservation department?** If it is on Save Our Lake letterhead and if the direct names of sales consultants are removed, would this not be a step in the right direction?

   The solution of using phosphate free products to start positive action is continually suggested by scientists and stewardship information sheets, but NO ONE is actually 'biting the bullet' in **high places** and making it easier for citizens to begin to do this positively. It was suggested that **SOUL** could do this on their own, but how do we begin? The Privacy Act forbids us to access cottage Association addresses and it is only by continuous networking that we have even started to make our own direct contacts.

   I was told that we could apply for Stewardship funding to do a direct mail -out. If this was granted, what is the difference between accessing government funding to do it and having government include the information in their own mailings? Except one method does it openly and the other silently?

   Sarah Coughlin has shared the sources of many good products with me and these too should be provided to citizen individuals or groups in order for them to approach their local store owners to ask for change. We as citizens cannot apply sufficient or useful pressure without the material knowledge to do so.

2. The City Of Winnipeg has recently come out with a very lukewarm approach to the use of cosmetic fertilizers. **Save Our Lake** attended and made a presentation on the issue and I stayed and listened to other presenters for four hours. On my count, there was only one group out of approx. twenty, who were against a ban and this was the lawn care

companies. I strongly believe that our citizens are ready to be told by legislation to' toe the line'. Only those, who by force of habit try to find loopholes in every regulation, would refuse. Most people are law abiding and will do the right thing for the environment.

The Province needs to force the issue now, not later, and get on with beginning to stem the green tide! By all means go the national/ provincial route for federal regulations, but in the meantime make a start here and now in Manitoba, with our own stance. We are on the end of the receiving line in our watershed and the lake compounds everybody else's nutrients. It is therefore good to know that other jurisdictions are beginning to act, particularly down south. **But we need to show, like them, a very positive example by acting now**, not in a few years, by which time the situation will be far worse. Science has shown for a number of years that Phosphate containing products are one of the main causes of the Lake's woes. Enough studies have been done on this issue. Action is necessary and required.

3. Most lawn care companies have alternative fertilizer programs, which are better for the environment. Those who use these companies will merely switch to the alternative, if given no option. Hence companies should not lose business. In addition, they will have to, through their suppliers, put much needed pressure on the multinationals to find safer alternatives quickly. Why should it be just the normal grass roots citizens who have to bear the brunt of asking for change?

4. On the question of golf courses, I see reason for only the greens to be fertilized. Fairways should suffice with cutting and rough is rough ! These recreation facilities do not have to be perfect all over their whole area !

5. Table on P 3. I find this confusing !

Why are no buffer zones indicated for the most vulnerable areas? Obviously, the use of fertilizers are not allowable, period, but why cannot this be stated quite clearly rather than leaving an open space ?

On this same issue I find it difficult to understand why in water management areas (The Washow Bay one for instance near Hwy 8) that drainage ditches are made and kept so clean and straight that the water drains quickly and fast to the Lake, without any areas of wetlands to buffer the effects of any nutrients being carried? Do I assume that no fertilizers are spread on the fields adjoining in these areas?

5. Household cleaning products. I have for many years been using phosphate free products and I hear constantly that they are more

expensive. But indeed this is far from the truth, since most of them are so concentrated that very little of the product is required to be effective and this leads to a more friendly, efficient and cheaper product.

It is a no-brainer when it comes to what action to take on dishwasher products! Let us get the federal government to put the same type of regulation on a.s.a.p. Maybe, now that we have federal scientists on board the Namao, then action may result sooner rather than later! The press reported that the nutrient level in our Lake is worse than it ever was for Lake Erie at its worst. Why hasn't this being initiated sooner, I ask, based on our own local scientific research ?

6. The question of wastewater treatment and septic treatment. While the City is slowly and at great cost inputting new sewage treatment, so be it. We who have caused the problem need to pay to fix it.

However being a cottage owner in a provincial park, I question how Conservation is dealing with this issue ,in their area of jurisdiction. We, at the Grindstone AGM, were told by Conservation staff (Donna Smiley) that our lagoon had not been up to standard for 9 years. Cottagers were all wondering what was going to happen this season and we were left wondering about a new lagoon, trucking out elsewhere etc. and cost. Imagine our surprise that when the season started the contractor for septic waste disposal informed us that the lagoon was still functional and a second cell already there would be used! How can the situation be resolved so fast in a few months?

Whilst Conservation continue to open up new lots, allowing permits for bigger suburban type houses in cottage areas, which have basements and all modern amenities, with huge septic tanks receiving all waste water containing who knows how much phosphate nutrients.....where is all this waste water going to go? Into the recently discovered sewage lagoon, which was not and now is, up to standard ?
Is Conservation doing all their homework on what the existing infrastructure can take in these areas with expanding cottage numbers? Is income from leases the only factor here or is the environment being considered as well?

Are homeowners, who purchase composting toilets and almost totally minimize their environmental footprint in cottage areas, going to be given a fee break when this service is evaluated for a fee for cost ratio? Should this idea be floated by the Consultant for that investigative committee?

Is this not a subject that Stewardship and Conservation can talk about together? Would it not be better for the environment to encourage the

use of composting toilets rather than extending the life of or the spending of money on any new lagoons? We should all be encouraged to make our environmental footprints smaller, following the example of Sweden for example.

7. Education.

This is sorely needed, but Education **is only useful if positive practical action solutions are also indicated.**

While I have known how to access new information, I question whether the normal distribution process is getting it out as widely as is necessary. The water responsibility Handbook is an excellent publication, but needs to be in every household in the Province (and beyond!)

Can it not be included with every tax statement in the City and the equivalent in the rural municipalities? The money spent would be well worth while the payoff to our water ways, lakes and environment. The reliance on electronic communication is highly overrated when it comes to long documents. The older ways are still as effective and tangible **to all** members of a household.

Mo Tipples. Very concerned citizen
Chair of Save Our Lake. SOUL

Armstrong, Nicole (WSD)

From: Bev Sawchuk [bevsawchuk@shaw.ca]
Sent: September 1, 2007 5:52 PM
To: +WPG1218 -Water Quality (WSD)
Subject: Share Your Views / Rivers and Lakes
Attachments: Lake Winnipeg.doc

Hello, I am a 2nd year student pursuing my degree in Environmental Studies at the University of Winnipeg. I recently prepared a research report on Lake Winnipeg, which included an interview (see Appendix II) with cottage owners who provided their comments about the Lake.

I am unable to attend the public consultations, but thought you may be interested in seeing the results of the attached report.

Thank you.

Beverley Sawchuk
(204) 256-2246
bevsawchuk@shaw.ca

Dick and Jane Visit The Blue-Green Monster:

A Primer on Lake Winnipeg

Prepared by Beverley Sawchuk

Research Paper for Sustainability & Environmental Politics
Professor Ken Gibbons, Department of Politics
University of Winnipeg

March 19, 2007

SP

1. Introduction

The names "Dick and Jane" will likely be familiar to any one who learned to read between 1930 and 1970. This brother-and-sister team served as the main characters in a series of books describing the duo's adventures as they played, made friends and explored (Dick and Jane, Wikipedia). The primary goal of the Dick and Jane Primer was to teach basic reading skills.

The goal of this research paper is to provide in layman's terms an explanation of the environmental situation currently facing Lake Winnipeg, essentially a Primer that answers some basic questions:

- What causes the blue-green color of the Lake?
- Why is it a problem?
- When was the problem discovered?
- Who is going to fix the problem?
- How can Dick and Jane help?

Despite ongoing media coverage about Lake Winnipeg, there has been inadequate information provided directly to the public. It is likely that most people do not comprehend the complexities of this issue, nor do they understand how they can take steps to assist in solving the problem. This document will help to convey that information. The Lake Winnipeg Stewardship Board recently indicated:

> *"Manitobans must play a lead role in rehabilitating and protecting Lake Winnipeg. It is critically important that all Manitobans gain the knowledge and understanding of how their choices and activities can influence the water quality of Lake Winnipeg, and the rivers and streams of its watershed"* (Manitoba Water Stewardship{a}, 2006, p. 31).

With these points in mind, it seemed appropriate to invite Dick and Jane along for a brand new adventure in 2007 .... a journey to Lake Winnipeg to visit the blue-green monster. At the end of our excursion, both our famous duo and the reader should not only have a better understanding of the problems facing Lake Winnipeg, they will also know what they can do to help. After all, we all live downstream from each other.

2. The Facts: Did You Know?

A. The Area

Lake Winnipeg is centrally located in Manitoba, and is the world's 10th largest body of freshwater with an area of approx. 24,000 km^2. The water in Lake Winnipeg flows northward, and exits the Lake via the Nelson River which drains into Hudson Bay (Lake Winnipeg, Wikipedia). Lake Winnipeg's tributaries include many small rivers and streams, as well as the following waterways:

- Red River - draining Assiniboine River, Seine River, LaSalle River, Souris River
- Winnipeg River - draining Lake of the Woods, English River, Rainy River, Rainy Lake
- Lake Manitoba - draining Lake Winnipegosis, Lake Dauphin
- Saskatchewan River - draining North Saskatchewan River, South Saskatchewan River, Battle River

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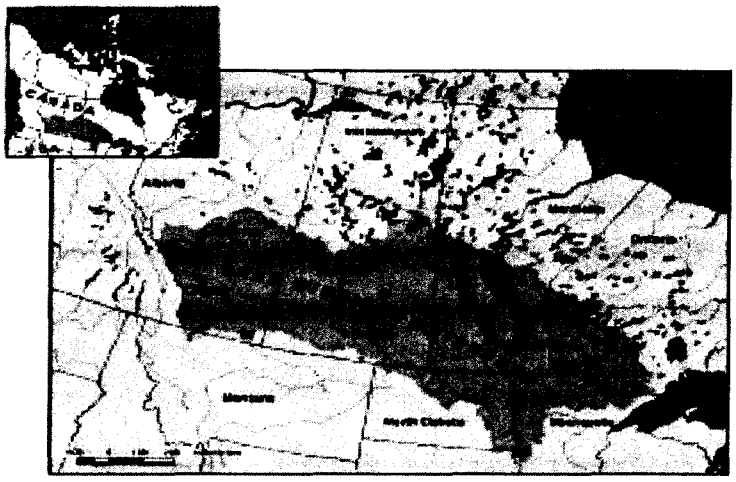

Lake Winnipeg's watershed is nearly 1,000,000 km². A watershed acts like a funnel, and collects water from the region's streams, rivers and all land surfaces where run-off occurs such as lawns, golf courses and farms. Lake Winnipeg's watershed covers 4 Canadian provinces and 2 American states: Alberta, Saskatchewan, Manitoba, Ontario, Minnesota and North Dakota. The Canadian portion is home to 5.5 million people, and the US portion contains 1.1 million people. About 80% of the population resides in major urban centers: Edmonton, Calgary, Regina, Saskatoon, Brandon, Winnipeg, Grand Forks and Fargo.

The Lake's natural features vary greatly and include sandy beaches, large limestone cliffs and caves. The eastern side contains pristine boreal forests and rivers, and is being promoted as a potential United Nations World Heritage Park. The diversity of vegetation sustains an assortment of wildlife including endangered species such as woodland caribou, wolverines and bald eagles. The Lake itself is home to a great variety of aquatic life, and is located on the Mississippi Flyway which is a major migratory route for birds.

B. Shoreline Residents

Over 23,000 permanent residents live in 30 communities along the shoreline of Lake Winnipeg, including 11 First Nations communities. In addition, many people enjoy spending leisure time at the approx. 10,000 cottages located on Lake Winnipeg (What Ails Lake Winnipeg, 2004, p. 38). The communities of Victoria Beach and Seymourville obtain drinking water directly from Lake Winnipeg, and others rely upon wells with water drawn from the Lake.

C. Recreation and Tourism

There are 7 provincial parks in the Lake's southern basin: Hecla/Grindstone, Grand Beach, Beaver Creek, Winnipeg Beach, Elk Island, Camp Morton and Hnausa Beach. These scenic areas offer many recreational activities such as swimming, boating, sport fishing and camping as well as a variety of special events. The town of Gimli, on the Lake's west shore, becomes a unique destination each August when up to 50,000 visitors attend the Icelandic Festival, "Islendinnadagurinn". Victoria Beach, on the south-east shore, has a

permanent population of 227 residents, but during the summer swells to about 10,000. Grand Beach, on the east shore, is well known for its 3 km of white sand beach and was visited by over 609,000 people in 2003. According to Steve Ashton, who was the Minister of Water Stewardship in 2004:

> *"Lake Winnipeg is a spectacular asset that we must safeguard for the benefit of future generations. It is the world's 10th largest freshwater body of water, and contributes more than $150 million annually to our economy through tourism and our commercial and sport fishery"* (Manitoba Government News Release{a}, 2004).

D. Commercial Fishing

The province of Manitoba is the largest commercial producer of freshwater fish in Canada. Lake Winnipeg contributes to over 40% of provincial production with its pickerel, goldeye, sauger, perch and whitefish. Many of the local fish processing plants use water sourced from the Lake in their operating facilities. In 2004-2005, the value of Lake Winnipeg's commercial fishery was $17.5 million, and 910 licensed fishers were employed (Manitoba Water Stewardship{a}, p. 9).

E. Hydro-Electric Power

Lake Winnipeg is Manitoba Hydro's most important storage reservoir, and is used to generate hydro-power on the Nelson River. The project is comprised of a generating station at Jenpeg, three channels and a dam built to increase the Lake's outflow by approx. 50% during peak demand in the winter. Lake Winnipeg is the world's 3rd largest reservoir for the production of hydro-electric energy. In 2005-2006, power sold by Manitoba Hydro totaled $1.9 billion, of which $881 million was in export sales (Manitoba Water Stewardship{a}, p. 16).

3. The Problem: A Blue-Green Monster

A. Eutrophication

Lake Winnipeg is under siege from blue-green algae, and is currently the most eutrophic of the world's major lakes (Casey, 2006, p. 63-78). When a lake becomes eutrophic, it means there is an excess of decaying algae. As algae dies, it uses up oxygen and changes the lake's biological balance. Oxygen depletion can create a dead zone in lakes, devastating fish population and affecting the entire food chain. The eutrophication was identified in 1998 by members of The Lake Winnipeg Research Consortium, a group conducting scientific research on the Lake's water quality after the 1997 Red River flood.

B. Contributing Factors

What causes eutrophication? The author of "Freshwater Pollution, Canadian Style", states:

> *"It is difficult to pinpoint what particularly is responsible for the observed eutrophication of a lake. Usually the cause is multiple - the addition of phosphates, nitrates, sewage and other materials - and the effect is a gross and fairly rapid deterioration of natural conditions"* (Larkin, 1974, p. 67).

Because Lake Winnipeg's watershed extends across 4 provinces and 2 states, it collects water from many different areas containing different types of pollutants:

- ORGANIC: Includes human sewage and animal manure.
- DIRECTLY TOXIC: Includes pesticides, insecticides, oil, heavy metals and pulp mill effluents.
- ENRICHMENT: Includes mineral nutrients such as phosphorus and nitrogen, commonly used as fertilizers. The nutrients in Lake Winnipeg can be traced to several sources (Welch, 2007, p. B1):

Source	*Phosphorous*	*Nitrogen*
City of Winnipeg	5%	4%
United States of America	35%	21%
Saskatchewan and Alberta	5%	9%
Ontario	13%	21%
Other wastewater sources	4%	1%
Agriculture	15%	5%
Atmospheric deposits	6%	10%
Natural sources, i.e. wildlife	17%	19%
Lake processes	--	10%

According to the 2006 report from the Lake Winnipeg Stewardship Board (Manitoba Water Stewardship{a}, 2006, p. 24-25), human factors contributing to the eutrophication include:

- household cleaning products containing phosphorous and nitrogen.
- urban run-off carrying contaminants such as lawn/garden chemicals and pet feces.
- municipal sewage and leaking septic fields.
- livestock manure.
- synthetic crop fertilizers.
- industrial discharges.

Dr. Eva Pip, a University of Winnipeg professor who specializes in aquatic ecology and water quality, believes that some additional factors include (Pip, 2006, p. 3637-3642):

- drainage of wetlands.
- manipulation of water for hydro-electricity.
- increased pressures from residential and recreational development.
- land clearing and forest cutting on the Lake's east side which creates faster run-off.

In addition, Lake Winnipeg is not exempt from changes being created by global warming. Longer seasons of open water combined with warmer conditions create more evaporation. This results in less dilution of nutrients and longer periods of warm water, creating prime conditions for algal blooms (Kling, 1998).

C. Effects

It is difficult to place a specific dollar value on the effects of Lake Winnipeg's eutrophication. Aside from the environmental consequences, it is safe to say that social and economic implications are far reaching in terms of recreation and tourism, sport fisheries, commercial fisheries and hydro-electric power.

In 1999, thick mats of algae covered 8,000 km^2 or 1/3 of the Lake. Since then, algal blooms have continued to increase in frequency, duration and intensity. Blue-green algae is fouling drinking water, clogging fishing nets, reducing fish catches, and clogging intake filters at fish processing plants. Beach advisories warn of

high bacterial levels because dying blooms of algae can produce liver and nerve toxins that are deadly. Dogs and livestock have died from drinking water in a bloom, and people swimming in these areas have acquired rashes, upset stomachs and breathing problems. While blue-green toxins have been discovered in fish and waterfowl, the extent to which they affect people who eat contaminated fish/waterfowl is not yet known. Some studies suggest increased susceptibility to liver and colon cancer (Portman, 2004, p. B1).

Physical changes to the Lake include shoreline erosion, changes in water level cycles and a loss of biodiversity (Pip, 2006, p. 3637). In the 1970s, there were 11 species of mussels, some of which live more than 100 years. However, in 2006, there were only 5 species left. The Lake Winnipeg physa snail is a new species that is at risk of disappearing before it has been officially named. This snail, which appears to exist only in Lake Winnipeg, has already disappeared from 2 of its 5 sites. Another species, lake sturgeon, is Canada's largest freshwater fish. It can live to 150 years and reach weights of 135 kg (Canada Newswire, 2006). The Committee on the Status of Endangered Wildlife in Canada has stated that Lake Winnipeg's lake sturgeon and physa snail are currently at risk of extinction, along with 4 other species of fish: silver chub, bigmouth buffalo, shortjaw cisco and chestnut lamprey (Biodiversity Perspectives, 2005).

4. The Stakeholders: Who Made This Mess, and Who's Going to Clean It Up?

A. Community

Wherever there are people and extensive human activity, there will be an impact on waterways. The reality is that if you live, work or play anywhere in Lake Winnipeg's 1,000,000 km² watershed, you have had an effect on the Lake. We are *all* stakeholders.

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Some urban areas encounter water quality problems because of inadequate treatment facilities for sewage/wastewater. There are several different levels of treatment for wastewater:

- PRIMARY TREATMENT: Mechanical processes remove large solids and sediment.
- SECONDARY TREATMENT: Biological processes degrade bacteria and micro-organisms. After this level of treatment, approx. 30% of phosphates and 50% of nitrates still remain. Some municipalities construct sewage lagoons where treated waste is exposed to sunlight and air that further degrades the matter at lower costs.
- TERTIARY TREATMENT: Chemical processes remove phosphates, nitrates and other toxic compounds. This 3rd level of treatment significantly reduces nutrients in wastewater.

Using Winnipeg as an example, the city has 3 wastewater treatment plants, and each plant provides secondary treatment before discharging wastewater into the Red and Assiniboine Rivers (Manitoba Conservation, 2002, p. 22). The city's combined sewer system serves 2 roles: a sanitary sewer which transports waste from homes/businesses, as well as a storm sewer which carries rain and snow-melt. During dry weather, the combined sewer system carries all waste to treatment plants, but a problem may occur during wet weather when the flow exceeds capacity of treatment plants. This will result in untreated wastewater flowing directly into the Red and Assiniboine Rivers. In 2002, the situation was exacerbated when a pump failed at Winnipeg's North End treatment plant, and 650,000 meters^3 of raw sewage poured into the Red River. Winnipeg's "*combined sewer overflow mitigation and nutrient reduction are major factors influencing the next generation of wastewater collection and treatment improvement initiatives*" (Civic Environmental Committee, 2003, p. 44). The city is in the process of upgrading its sewer system and wastewater treatment plants, with full nutrient removal to be implemented by 2014.

Shoreline lots for homes and cottages are in demand. The Rural Municipality of Gimli saw its population increase nearly 10% during 1996-2001, and there are presently more than 15 registered harbours located on the Lake. In 2006, Manitoba offered for sale/lease 300 new cottage lots along the shores of Lake Winnipeg (Manitoba Water Stewardship{a}, 2006, p. 11). While there are certainly economic spin-offs from this continuing development, there is also some concern regarding its environmental sustainability.

Wetlands and marshes once comprised a large portion of Canada's landscape, but approx. 70% of wetlands in the central prairie region have been drained for urban and agricultural development. Wetlands are incredibly diverse and valuable. They provide food and habitat for wildlife and waterfowl, serve as recreational areas, provide flood control, prevent erosion, and act as natural filters by slowing the run-off of ground water and removing nutrients. These ecological services have values of up to $24,300 per hectare annually (Leahy, 2005, p. 19), and their loss is detrimental.

A large portion of the Lake's watershed is used for the production of agricultural crops and livestock. In 2000, synthetic crop fertilizers were applied to 20 million hectares of farmland in the 3 prairie provinces (Manitoba Water Stewardship{a}, p. 13). In addition, 1 million hectares of farmland received livestock

manure. The livestock industry has grown rapidly, as shown by Manitoba's hog industry which exploded from 870,000 hogs in 1975 to 8.8 million hogs in 2006 (Kives, 2006, p. A4). One hog can produce 10 times more phosphorus than a person, and its manure does not have a waste treatment system (What Ails Lake Winnipeg, 2004, p. 38). Any manure spread on fields during winter may lay dormant, but will run off in spring into nearby ditches and streams.

Grazing by livestock can create major disturbance to riparian areas, the green zone at the edge of rivers where vegetation grows. These narrow strips of land filter significant levels of toxins: 50%+ of nitrogen and phosphorous, 50%+ of pesticides, and 75%+ of sediments (Oborne, 2004, p. A15). However, if a riparian area has been damaged by livestock which trample riverbanks, eat shrubs or contaminate water with feces, it will be unable to perform these functions.

Hydro-electricity is another factor. Lake Winnipeg retains more than 200 tonnes of phosphorous annually because of its use as a storage reservoir for the production of hydro-electric energy (Fallding, 2005). Additional concerns include impacts on the ecosystem created by diversion of water and fluctuating water level cycles. Clearly, it is undeniable that the community has played a major role in the situation facing Lake Winnipeg, be it unintentional or otherwise.

B. Lake Winnipeg Research Consortium Inc. (LWRC)

The Lake Winnipeg Research Consortium Inc. was established in 1998 to conduct scientific research on the Lake. LWRC's research activities includes studying impacts of nitrogen and phosphorous on the Lake's water quality and food chain, and examining algal toxins. For its scientific research, LWRC operates the Namao, a boat built for the Canadian Coast Guard in 1975. The boat was diverted in 1999 from the scrap pile for use on Lake Winnipeg. Namao, which means "sturgeon" in Cree, can accommodate 6 scientists and a crew of 9 members (Lake Winnipeg Research Consortium).

C. Manitoba Provincial Government

Manitoba Water Stewardship is Canada's first department devoted entirely to water. In 2003, it launched the Lake Winnipeg Action Plan and established the Lake Winnipeg Stewardship Board. The Board's mandate includes providing advice on the Lake's health, coordinating a watershed management plan with local conservation districts, implementing methods to reduce nitrogen and phosphorus to pre-1970 levels, and examining issues affecting sustainability of fisheries. With the Board's input, a number of remedial measures have been implemented in Manitoba (Manitoba Water Stewardship{b}, 2007):

- The Province committed over $100 million to improvements in drinking water and wastewater treatment systems. New or upgraded wastewater treatment facilities are required to meet reduced levels of nutrients, as recommended by the Clean Environment Commission, an agency which facilitates public involvement in environmental matters.
- Fines under the Environment Act have increased, with new staffing resources added to inspect and regulate enforcement of septic fields and wastewater systems.

- Sewage disposal regulations, updated for the first time since the 1930s, limit locations of holding tanks and septic fields.
- The Livestock Manure Regulation places limitations on manure spreading.
- The Riparian Tax Credit encourages protection of vegetation along rivers and streams.
- Soil testing programs raise awareness of nutrients.
- Annual funding of $150,000 is allocated for scientific research.

In December, 2006, the Lake Winnipeg Stewardship Board submitted a report with recommendations to Christine Melnick, the Minister of Water Stewardship. Minister Melnick confirmed that the Province has already acted upon or initiated action on 113 of the report's 135 recommendations. Some new priority areas will include:

- Initiate public education about the harmful impact of products containing phosphorous. Each pound of phosphate can create 700 pounds of algae (Larkin, 1974, p. 67).
- Curb use of soap and other household products containing phosphorous. Phosphates were banned from laundry detergents over 30 years ago.
- Regulate fertilizer used near waterways by farmers, golf courses and homeowners.
- Increase funding for scientific research.

In addition, Manitoba announced in November, 2006 a hog-barn moratorium in order to reduce phosphorous in the Lake. This temporary pause on new and expanded barns will stay in place until the provincial water protection plan has been reviewed by the Clean Environment Commission (Manitoba Government News Release{b}, 2006).

D. Canadian Federal Government

While it is provincial governments who have prime responsibility for managing and protecting water quality, the federal government protects water quality by regulating toxic substances, conducting research, and promoting prevention of pollution. Before LWRC began its research on Lake Winnipeg, studies by the federal government had been performed only sporadically in 1929 and 1969. This lack of basic data and inadequate monitoring has undoubtedly contributed to the problem. Dr. Brenda Hann, a University of Manitoba professor of zoology, stated that Lake Winnipeg *"is probably one of the most poorly studied large lakes in North America"* (Taking a Closer Look, 2007).

Another obstacle has been lack of funding for research and monitoring activities. The federal government has spent more money researching lakes in Africa than it has on Lake Winnipeg (Casey, 2006, p. 63-78). From 1999 to 2004, LWRC's annual budget of $380,000 was contributed by local businesses, rural municipalities and agencies. In 2005, the federal government allocated $1.1 million for water quality monitoring on the Red River and Lake Winnipeg.

Because the Lake's watershed covers 4 provinces and 2 states, strong inter-provincial and international cooperation is critical if a comprehensive solution is to be developed. Quite simply, the degree of effort being focused by Canada on the Great Lakes needs to be applied to Lake Winnipeg. The federal government

should support inter-jurisdictional discussions and provide increased funding for educational and research activities. Canada's involvement as a partner with Manitoba in this initiative is long overdue.

E. United States of America

The International Joint Commission was established in 1909 to arbitrate disputes regarding USA/Canada boundary waters, conduct feasibility studies, and approve water diversion projects. The International Red River Board is a member of the Commission, and deals with matters regarding the Red River and its tributaries. In 2003, Manitoba requested that the Board review the establishment of water quality guidelines for nitrogen and phosphorous at the Canada/USA boundary. The Board supported the recommendation, and Minnesota and North Dakota have made commitments to reduce nutrients flowing into the Red River by 10%. In addition, a strategy to gather and analyze data was implemented in 2006 (International Joint Commission{a}, 2006, p. 3-10).

Another project, Devils Lake Diversion in North Dakota, drains water into the Sheyenne River, Red River, and ultimately Lake Winnipeg. Because there was a concern that Devils Lake drainage could transfer fish parasites and other foreign materials, a temporary gravel filter was installed at the outlet. Subsequent international negotiations resulted in an agreement for permanent filtration. However, in 2006, North Dakota received a permit modification which removes the specific time frame for operation of the outlet and allows increased levels of sulfate. Manitoba has filed an appeal and the matter is before the courts. Drainage from the highly saline Devils Lake could contribute 20 tonnes of phosphorous annually to Lake Winnipeg (Fallding, 2005).

5. The Great Lakes: What Did We Learn?

In the 1970s, human-caused eutrophication appeared in Lake Erie, part of the Great Lakes chain. The lake's blue-green algal blooms created a dead zone of nearly 7,000 km^2 where bottom-dwelling species declined or disappeared completely (Portman, 2004, p. B1). The amount of chlorophyll in water is a good indicator of algae, and Lake Winnipeg has chlorophyll levels of 3 to 4 times higher than Lake Erie during the 1970s.

Scientists feared Lake Erie would be unable to support fish population as other species such as bald eagles, gulls and otters had been harmed or eliminated. In addition, a study on long-term exposure to low levels of toxic substances revealed that mothers who ate contaminated fish from the Great Lakes had babies that were more likely to be premature, weigh less, and exhibit slower emotional responses than babies whose mothers ate less or no fish (United States General Accounting Office, 1990, p. 9). Ross Hume Hall of the International Joint Commission of the Great Lakes stated:

> *"If Martians took a look at planet earth, they'd be puzzled. For they'd see that we had polluted 1/5th of the world's total water supply (the Great Lakes) with chemicals ... and contributed to human disability and illness, including cancer. The Martians would say how could humans be so stupid."* (Haley and Tunstall, 2005, p. 181)

Restoring the Great Lakes was a massive undertaking with the International Joint Commission, USA and Canadian governments, industry, educators, environmental groups and individuals. The Great Lakes Quality Agreement was created in 1972, and amended in 1978 and 1987. The Great Lakes Action Plan was signed in 1989, and followed by the Great Lakes 2001-2006 Agreement and the 2002 Canada-Ontario Agreement. This long-term and multi-stakeholder process involved coordination of research and clean-up activities, as well as significant financial investment in construction of wastewater treatment plants, restructuring of manufacturing processes, protection of wetlands, analysis of water quality, reduction of phosphates in detergents, and control of run-off from rural and urban areas.

In 2004, the International Joint Commission released its "Twelfth Biennial Report on Great Lakes Water Quality". The report stated that toxic chemicals had declined over the past decades, but questioned if policy and management efforts were sufficient to protect water quality and the ecosystem from continued urban expansion. The report also stressed a need for coordinated management of waterways to avoid future impacts from agriculture, development, industry and urban centers (International Joint Commission{b}, 2004, p. vi). Part of the complication arises from the inherent difficulty in regulating access to water because it is used by everyone but owned by no one. It is evident that:

> *"The resources spent by the federal and Ontario governments to clean the Great Lakes will benefit Detroit, regardless of whether Detroit helps to pay for such efforts. This dilemma provided to be a major challenge in attempts to clean up the Great Lakes over the last two decades, and remains a challenge today"* (Speake and Gismondi, 2005, p. 58) .

6. Conclusion

Life on earth is connected and inter-dependent. If water is polluted upstream, the effects will be felt downstream. In essence, we are fouling our own nest.

Lake Winnipeg's problem was not created in a day, and it wasn't created by one city or one industry. The remedy won't be simple or quick, as evidenced by the Great Lakes clean-up which began in 1972 and continues today. All levels of governments and the community need to step up to the plate, and become part of the solution. An important part of that process will be Manitoba's 2007 commitment to public education.

The interview in Appendix II substantiates that the public requires direct communication and should be provided with *"balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions"* (International Association for Public Participation, 2007). Currently, Manitoba provides information on its Internet web sites, but should expand its approach to incorporate other methods: coordinate open houses; distribute information with utility bills; make presentations to schools/universities; host information booths in shopping malls; set up displays in venues

like The Manitoba Museum, Oak Hammock Marsh and Fort Whyte Centre; and distribute brochures to tourist resorts and park offices.

Public involvement is an integral component of change, and the community must be empowered. While the combined actions of many have created Lake Winnipeg's eutrophication, the reverse will also be true if there is a concerted effort to turn things around. The guidelines in Appendix I serve as a starting point for Dick and Jane. It is certainly a good place to begin, and there's no time like the present.

Appendix I
How Can Dick and Jane Help?

General Guidelines

- Don't flush anything in the toilet that wouldn't normally be flushed. This includes diapers, dental floss, plastic tampon holders, cigarette butts, chemicals and medications. While wastewater facilities treat human waste, they are not designed to treat other substances.

- Recycle. The less waste put in landfills, the less chance it has to get into waterways. Carry your own coffee mug/water bottle to avoid using disposable cups/glasses. Re-use grocery bags or alternatively use canvas bags when shopping.

- Properly dispose of hazardous waste at authorized facilities. This includes items such as paints, furniture strippers, fertilizers, insecticides, herbicides, automotive products and pool chemicals. In Winnipeg, SafeSpace (phone 204-254-4563) provides a pick-up and delivery service. SafeSpace is a non-profit group which donates its profits to Wildlife Haven Rehabilitation Centre.

- Pick up after your pet when taking it for a walk outside. Feces left on sidewalks or in parks will eventually be washed into sewers during rainfall or snow-melt.

- Water your lawn only when necessary during dry spells. Water deeply (2-3 cm of water) every five days, during the coolest part of the day.

- Avoid using railway ties for landscaping projects. Ties are usually treated with creosote, containing toxic chemicals which can leach into soil and water.

- Reduce use of toxic insecticides and herbicides to control unwanted insects and plants. These chemicals can leach through the soil and end up in waterways. Use environmentally friendly products or alternative techniques such as removing weeds by pouring boiling water on them.

- Instead of using chemical fertilizers in gardens, use environmentally friendly products or lawn clippings as mulch. Clippings, if free of pesticides and herbicides, are a good organic fertilizer.

- Reduce usage of phosphorus, a nutrient typically found in lawn fertilizers, manure and detergents. As the phosphate level in dishwater detergents varies greatly, select one with a low content:

Dishwasher Detergent	*Phosphate*
Ecover Tablets	0%
Palmolive Gel	1.6%
Cascade Complete Gel	4.0%
Electra-Sol Powder	4.9%
Cascade Complete Powder	7.7%
Cascade Complete Tablets	8.5%
Palmolive Tablets	8.7%

- In Winnipeg, environmentally friendly household products are available at Organza Market, 203 Osborne Street. Visit the website www.organzamarket.com or phone (204) 453-6266.

- Choose environmentally friendly appliances for your home, as well as kitchen/bathroom fixtures that are low flow. Look for products with Environment Canada's "Environmental Choice EcoLogo", which maximize energy efficiency, use recycled or recyclable material, and minimize use of hazardous substances. Visit the website www.environmentalchoice.com or phone 1-800-478-0399.

Tips for Rural and Shoreline Residents

- Restore the shoreline by planting natural vegetation on your property and in the water. This will create an improved habitat for fish and birds, as well as improve water quality and reduce erosion.
- Ensure that your septic system is well maintained and pumped out regularly. A leaking tank can contaminate your property and waterways.
- Keep livestock away from shorelines in order to avoid erosion and manure from entering the water.
- Do not use toxic preservatives for docks or decks.
- Do not use herbicides on land or in the water to control aquatic plants.
- Avoid creating a wake with your motor boat near shore. Never spill on-board toilet contents, gas or bilge into the water, and avoid usage of boat engine cleansers.
- Inspect watercrafts for aquatic plants and animals in order to avoid transferring material between bodies of water.
- Learn about waterfront living. Visit the website www.livingbywater.ca, or obtain the book, "On the Living Edge – Your Handbook for Waterfront Living", written by Sarah Kipp and Clive Callaway.

Stay Informed

- Attend a guided tour of Namao, the boat used by the Lake Winnipeg Research Consortium. Each summer, the public is invited to board Namao while it is in port at Gimli to learn about the scientific research being conducted on Lake Winnipeg.
- Obtain additional information from:

Manitoba Water Stewardship	www.gov.mb.ca/waterstewardship	Phone: 1-800-282-8069
Manitoba Seeing Green	www.gov.mb.ca/seeinggreen	Phone: (204) 945-7382
Lake Winnipeg Stewardship Board	www.lakewinnipeg.org	Phone: (204) 642-4899
Lake Winnipeg Research Consortium	www.lakewinnipegresearch.org	Phone: (204) 642-4446

Appendix II
Interview with Shoreline Residents

A face-to-face interview was conducted on March 6, 2007 with a married couple who reside permanently in Winnipeg, and own a cottage on Lake Winnipeg. This summary reflects their combined responses. Approval to conduct this interview was obtained from the University of Winnipeg, and a consent form to participate in the interview was signed by both of the participants.

* *

How long have you owned a cottage on Lake Winnipeg?

The cottage was previously owned by the wife's parents. It has been in her family for 53 years.

Is the cottage in the southern portion of the Lake?

Yes, the cottage is located at Ponemah Beach. It is on the west shore of Lake Winnipeg, near the village of Dunnottar.

Have you seen any changes to the area, i.e. changes in population, usage of the lake, water quality, shoreline, etc.?

Population has remained constant because there is no more room for development in their area. The area around Gimli is continuing to grow, but is not experiencing the same level of expansion as Lake of the Woods. The price of properties at Lake of the Woods has created an upsurge for people who own cottages on Lake Winnipeg ... there is more renovation, and more homes being torn down and rebuilt than ever before. There are also more permanent residents now on Lake Winnipeg than in previous years.

Rural Municipalities are upgrading sewage facilities, but some people still use outhouses. The issue of sewage systems was a big issue for the village of Dunnottar during a 2006 election, and the issue divided the community. One group stated that a central sewage system would create problems and not benefit the environment. No scientific data was presented, and the lack of information caused confusion. Ultimately, the sewage system was voted in by the community on a narrow margin, and the project will be proceeding at a cost of approx. $400 per cottage.

The couple currently uses a septic tank system for their cottage. A well is used as the main water source. The well is approx. 20 years old, and was dug when the couple tore down and rebuilt the cottage. The old artesian well previously used by the family is no longer in use.

A dike was constructed 30 years ago to prevent flooding in the area. Essentially the lake road was built up to form a dike. In 2006, there was a threat of high waters, and the Province extended the dike to include more cottages in the protected area.

There is more waterfowl in the area now than in previous years.

There have always been large fluctuations in water level (as much as 10'), and the beach is also very changeable. One day, the beach is sandy, and the next day it will be rocky.

As a child, the wife remembers experiencing "pea soup days" on the lake in July/August, when some algae would briefly appear in their area. It would not remain for a long time.

There have been no visible changes to the lake in the area of their cottage. In fact, some neighbours deny there is a problem with the Lake, because water in the south basin has not changed.

Do you eat fish from Lake Winnipeg?

Yes, pickerel and goldeye, usually purchased directly from commercial fishers in Gimli.

Do you know any details about Lake Winnipeg, i.e. size of watershed, how the lake contributes to Manitoba's economy?

The couple believed the watershed extended outside of Manitoba, possibly into Saskatchewan, and perhaps included a portion of the United States.

Economic uses of the lake include tourism, commercial fishing and hydro-electric power.

The lake's greatest benefit is its feature as a natural asset to Manitoba.

Are you aware of Lake Winnipeg's water quality problem? Do you know what factors have contributed to the problem?

The lake's problem is probably due to algae. Causes of the problem may be:

- Lack of control on animal and human sewage
- Hydro-electrical power
- Farming techniques, i.e. chemicals applied to land which is too close to the lake
- Cattle which walk on beaches close to the lake
- Industry in Selkirk and Pine Falls
- Sunscreen usage

Some residents at Ponemah Beach unhook their kitchen sink and tub/shower regularly so that the "grey water" runs out of the cottage directly onto the ground, rather than taking up room in their septic tank.

Who are the stakeholders in this scenario? Who caused the problem? Who is responsible for the solution?

Who is *NOT* a stakeholder? Everyone needs to be involved. It's not just Manitoba's problem. Other provinces and states should be concerned. There is currently too much complacency on the issue, and this matter needs to be elevated in status to become a Canadian problem. Everyone is proud of the Great Lakes and Canadian Rockies, but the green lake in the centre of Canada is a huge embarrassment.

This problem won't just wash away. There has been decades of neglect. The lake can't recycle that quickly. It's not like a caribou herd where if hunting is banned for a few years, the herd will rebound. The taps to Lake Winnipeg can't just be shut off.

Because the water looks the same, there is difficulty in understanding the problem. When the media reports on the matter, it's basically the same story over and over again. People feel helpless. There should be information distributed to all cottage owners. People want to become involved, but there is a lack of resources. The government must provide information to the public.

The public should stop hearing the message that the lake is "lost" or they will just throw up their hands and give up. People need to hear the lake can be saved. People need to understand what's been done, and what still needs to be done. Water experts and biologists are credible sources, and facts are needed.

If facts are provided to people, initially there may be some resistance to change. However, if 2 out of 8 people start changing their habits, eventually the number will increase to 4 and then to 6. The result will be a lot of pressure on the last few people to join in the effort.

Do you know any ways you might assist in helping to solving the problem personally?

The couple requires a better of understanding of what products are harmful, i.e. types of shampoos, soaps, paints, chemicals, etc. They want to become involved, to be part of the education process, and assist in the solution. They need more information in order to do so.

People can yell at government to fix the problem, but it will take a required effort from everyone.

Local individuals with credibility need to become part of the process, i.e. president of cottage owners association. Local people who have "connections" need to become involved.

Part of the problem is that politicians are usually around for a short term, and this is a long-term problem.

There are local grass roots groups being established, because they are sick of nothing being done year after year.

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Original comments could not be scanned – this is a copy of the text
Original copy available on request

Marylenne Sum
30 Sunny Hills Road R26 2X8

I absolutely recommend that

1) Federal/Provincial govt's of Canada legislate regulations requiring phosphate free automatic/hand dishwashing detergents be instituted ASAP across MB & Canada as well as all cleaning products that end up in our water.

2) Fed/Prov. gov'ts require all cleaning products list their % content of Nitrogen Phosphates.

3) A consistent national approach is developed because 70% of MB's surface H20 originates in upstream jurisdictions.

4) Encourage various companies to label & advertise their phosphate free products more prominently!
   e.g. Sobey's – Our compliments
   Dawn/Palmolive

5) eliminate/reduce sale/use of phosphorous containing fertilizer on lawns & crops

comment 1

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

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Comments:

Great to have this information but we need action NOW.
#1) BAN "Cosmetic" Fertilizers!!!
It's all nice & good that there's a "Lake Wpg Action Plan" but we need to reduce phosphorus & nitrogen by more than just 10-13%.
Lake Winnipeg is "Manitoba's Toilet Bowl".
Ever wonder why it's taking so long to clean up? Well, Gary Doer's cabin is in Lake of the Woods — ONTARIO.
Education is wonderful & appreciated — really. But what we need is STRICT legislation w/ hefty penalties. (and when does the government NOT like collecting money??)
and we need it now - not later.

cont →

2

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

p. 2.

Comments:

We need legislation in regards to cleaning products. Provincial legislation would be great and Federal would be even better. I can't believe we have allowed this for so long. And give me a break — the amount of waste & garbage that is in our rivers & streams! Livestock "mis"management is a much better term - at least it's truthful. Honestly we can't let our water; our ecosystem; our environment be damaged any further.

How & when will we get the "suits" in parliament to step up and make this LAW?!

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments: I would wonder who would police the new policies.

Dog farms, Chickens etc would have run off that could not be controlled easily. (- also regular grain & cattle farming).

New products (phos free) would have to be cheaper than what people are using now.

Good presentation.

Thanks.

80

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

Thank you for doing this forum I was surprised with the amount of phosphorous coming from other jurisdictions.
- I'm a cottage owner near lac du bonnet and have been concerned of this for a while now I have changed my sewage disposal, use no fertilizer or phosphorous soaps.
- While I am pleased + encouraged by this initiative, I find it in contradiction with other provincial gov. initiatives of putting more cottages on our waterways credibility is low on conservation commitment
- My other concerns with water quality is boat traffic + their influence on water quality. Mercury is another issue.
- of concern.
- I would ~~soil~~ test my soil if I knew where.
- The algae blooms on Lee River have become more prevelant in the past 5 yrs.

Thanks
Charlie Heibert@mts.net

81

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

9CC

Comments:

- Further education for public on alternatives to chemical fertilizers (eg. corngluten)
- regulations/legislation works as long as it is accompanied by education, monitoring, enforcement including resources being available to sustain these 3 items.
- Get the media on board with increased coverage of these issues (I see the beginnings of this, but we need more).
- Education of the public needs to be more than just naming alternatives. Information showing the effectiveness of alternative products and all 'side benefits' needs to be presented. (Eg of a 'side benefit' is using corn gluten is safer for families wildlife & pets in reducing exposure to toxic materials). Another one is how leaving clover in your lawn (2)

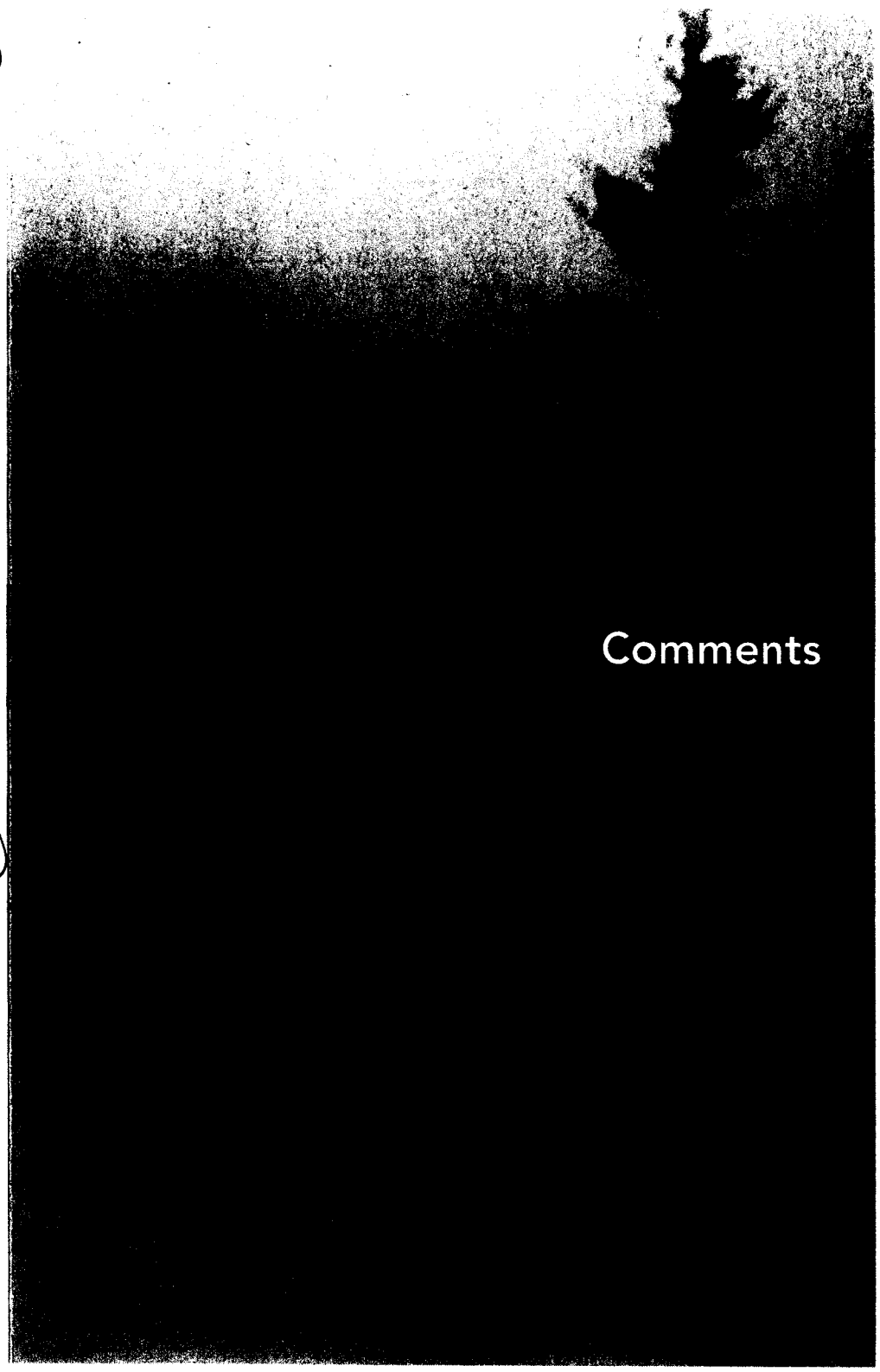
for the lawn. We don't need perfect lawns!)

PLACE POSTAGE HERE

Reducing Nutrients

Water Quality Management Section
Manitoba Water Stewardship
Suite 160 - 123 Main St.
Winnipeg, MB. R3C 1A5

(83)



5-Slide 2

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

- The number 1 priority for me in determining how I vote is initiatives to protect Lake Winnipeg's health.
- Education can come in the form of quick 'tips' - especially if using the media. Those who ~~are~~ have a long way to go to change personal practice are less likely to read large volumes of info - they need to hear quick 'sound bites'. Those of us who are trying to influence our social circles will have something to build from then. It needs to seem easy to make the change with no change in results (eg. clothes are cleaned just as well with a phosphate free detergent).
- We need more convenient hazardous household waste disposal (location + hours of operation)

84

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Michael Rapaport
333 Symington Rd
Ajax ON L1S 5J7

Comments:

I believe its very important. to reduce the pollution as later it could be not reversable

I think we should reduce the hog and cattle production and produce only for our consumption, and produce vegetables and fruit instead as its healthier and better for the invironment, The ~~trend~~ trend now is to eat more vegetables and fruit and less meat because meat causes health problems such as high colesteral causing heartattacks and cancers etc We could produce vegetable burgures and many other product that would last like meat or better and would improve our health and our Invironment Michael Rapaport

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

90

Comments: I think its very important to stop the polution. I think it would be posible to seperate the sewage from the toilets and the laundray water by posibly two sewage pipes or storage tanks or invent a way to treat the sewage seperately. posibly a water treatment in a laundromat or a large laundry cleaning facility, and also have a water treatment center at a large factorie that would remove mercury or other chemicals and the treatment would be designed for specific chemicals from different factories

yours truly
michael Rapaway
333 Symington Rd
wpg manitoba
R2C 5J7

90

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments: GROW ORGANIC GARDENS, VINEYARDS, FARMS; ELIMINATE FACTORY FARMS; GET RID OF HOG FARMS, FISH FARMS.. THESE ARE CARRIERS OF A LOT OF DISEASE & CRAMP & ARE CRUEL TO ANIMALS; USE COMPOSTING TOILETS; USE CHARCOAL TO FILTER/DETOX WATER. NO MORE CLORINE & FLUORIDE IN WATER THAT POISON & SEDATE PEOPLE. (CONSULT WITH VGR SCOTT OF GREEN PARTY ABOUT HIS HUMAN WASTE & VERMICULTURE SYSTE

PROMOTE VEGETARIAN & VEGAN DIET, THUS REDUCING ANIMAL TORTURE & SLAUGHTER, THE SPREAD OF DISEASES FR. ANIMALS TO PEOPLE, ↓LDL & ↑GENERAL IMPROVEMENT IN HEALTH AS STUDIES DONE ON & BY THE SDA CHURCH HAVE PROVEN REPEATEDLY. (RESEARCH 'CHIP' & 'NEWSTART' LIFESTYLE MEDICINE)

REMOVAL OF ALL PRODUCTS FR. MARKET THAT ARE ONLY FOR $ PROFIT WHILE DELETERIOUS TO HEALTH & ENVIRONMENT. USE BORAX, VINEGAR, HYDROGEN PEROXIDE, BAKING SODA FOR CLEANING; 7TH GENERATION & SOME OTHER 'GREEN' WASHING-PRODUCTS; SUNRIDER a BAKING-SODA TOOTHPASTE, ETC.

MORE PROMOTION OF COMPOSTING & THE STOPPING OF COMMERCIAL FERTILIZERS IS NECESSARY.

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

It would be nice if Municipal governments could do more to bring in laws & enforce them to stop pollution of our lakes

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

It seems to me your department is on the right track to fixing the problem in L. Winnipeg.

I only hope other provincial, federal + international jurisdictions that contribute to eutrophication problems in L. Winnipeg will be cooperative in discussion w/ Manitoba on doing their part to mitigate the problem.

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

UNL

Comments: OUR LIVES ARE BUSY AND FULL. THERE ARE MANY PRESSING ISSUES.

(1) WATER QUALITY (AND AVAILABILITY) IS AND MUST REMAIN THE MOST IMPORTANT.

WE DON'T HAVE MUCH TIME TO CHANGE OUR WAYS (2) GOVERNMENT MUST ACT QUICKLY AND DECISIVELY TO REQUIRE OUR CITIZENS TO CHANGE. GOVERNMENT WILL DISCOVER THAT THE MAJORITY AGREE.

(3) FERTILIZERS AND HOUSEHOLD CLEANING PRODUCTS MUST BE REGULATED IN THE MANNER YOU ARE PROPOSING — PREFERABLY TO AN INTERNATIONAL STANDARD (PROVIDED IT IS STRINGENT ENOUGH.) IF INTERNATIONAL AND NATIONAL AGREEMENTS DO NOT COME SOON, MANITOBA MUST ACT ALONE AND RIGHT AWAY.

(4) HIRE MORE INSPECTORS! WE HAVE PLENTY OF GOOD LEGISLATION IN OUR CITY, PROVINCE AND COUNTRY BUT NO ENFORCEMENT MEANS NO COMPLIANCE.

90

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

9(c)

Comments:

Excellent material - i.e. poster board session and handouts.

Seems to me this is a massive public education exercise and I sense this is recognized.

From what we read in the press there is a difference of opinion who the 'nutrient' bad guy is - that is, it be City of Winnipeg or agriculture for example. Perhaps clarification to the public is necessary sometime along the way.

I agree that being sure of the data is necessary before legislating anything. Broad getting / stakeholders on board - but once done perhaps a 'blitz' can be implemented of the household / industrial stakeholders in reducing their nutrient contributions!

I didn't notice anything specific how the mining industry is being monitored!

9e

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

It's important to go after all sources. The current display addresses residential sources only. Presumably there are complementary approaches for other sources. Given this limitation in scope, the measures proposed seem responsive if slow to implement. One measure that would help in the interim would be to maintain lists of detergents that are phosphate-free, low-phosphate, + high-phosphate (with current labeling) & encourage dealers to make these designations visible on store shelves. Manitoba is waiting for national action before provincial action as a last resort. Yet it is modeling its approach on Minnesota's. By joining Minnesota, MB would be creating a partial international solution, which could be added to until national govts respond. See Climate change parallel

92

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

9/4

Comments:

Shiny boards with bright lights, make them hard to read

There needs to be regulation of phosphorous in products. You cannot count on a generally uninformed public to do the right thing. How many even know the middle number is phosphorus? The province is too fearful of offending farmers and livestock operators. Strict controls are needed to provide buffers Stop urban sprawl - It is also a major contributor.

I expected there would be some kind of presentation. It is a long way to drive just to read a few boards

93

Original comments could not be scanned – this is a copy of the text
Original copy available on request

This open house has it's merit in that it provides the joe-public an opportunity to comment on contentious issues such as "water, it's ? to our survival like the rest of nature.

My biggest "beef" is urban sprawl in the capital regions of East/West St. Paul and St. Andrews and St. Clements. The provincial gov. needs to engage Municipalities along the Red River to pause urban development (using your words "pause on the pig operation scenario"). These politicians in the capital region are united with the real estate agents and the house developers. They are making millions $ and taking little to no responsibility for the negative outcomes of "septic fields", lawns and fertilizer, lost natural run off due to culverts, concrete and so on caused by this unnatural development.

Capital Region Gov't need to figure out other ways of taxing and delivering services to these rural residents. More urban/housing development seems to be a panacea and a quick cash solution to rural capital budgets..

Urban sprawl is a huge problem and the urban plans in these Capital Regions are escalating the nutrient dumping. Any effort to reduce nutrients will allow for more urban development outside of the Wpg and the Red River.

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

Put a stop to urban sprawl where land that might otherwise absorb nutrients are being built up, thereby increasing run-off into the lake. Nutrient-reduction strategies shouldn't mean: "hey we can do more development." I'm tired of seeing our agricultural + natural land around the city being gobbled up by the city. We need a green belt.

Also, banning phosphates in detergent + banning lawn fertilizers ~~are~~ is essential + I think acceptable to Manitobans.

Also, don't let agriculture off the hook. Needs to go towards organic

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

see figure ... control strategies ... phosphorus ... Automatic Dishwasher Detergents (ADD) to Lake Champlain, by Laura Hanrahan and Mildred Winslow Jr. Feb. 2004

Comments:

- I would like to see the province introduce mandatory bans on phosphorus content for both household and commercial cleaners. Vermont is introducing laws that will ban phosphorus in both household and commercial cleaners by Jan 1, 2009. (Lake Champlain ~~Steering Board~~ Committee

- It would be a good idea to create a forum for legislators in the ~~p~~ region to share ideas on nutrient loading

- Man needs to be regular inspection of septic tanks, with meaningful penalties
  - Also Sewage lagoons

⇒ The province needs to continue to push for Winnipeg, Dauphin and Brandon to modernize their waste water systems and how often to their deadlines

96

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

Thank you for your interesting display.

I will search for my fertilizer with 0 in the middle.

Need to know names of good cleaning brands. ie for dishwasher-

Thank you employees for spending this informative evening w us.

97

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

GNU

Comments: I think INTERNATIONAL co-operation is essential.

Information spots on television, radio ... explaining that vinegar is a substitute for WINDEX, etc might work.

The information evening at Holiday Inn West was helpful.

The idea of the importance of, and how to find, phosphate-free products is a good idea to get ~~up~~ out there.

Thanks.

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

99

Comments:

Thank for an informative display - such an important issue - the more public awareness the better!

Original comments could not be scanned – this is a copy of the text
Original copy available on request

Thank you for the opportunity to learn more about this problem & what the gov't is doing.

I expect the gov't to take a strong leadership role in protecting the environment through both education and regulations (not just "voluntary guidelines")

Manitoba cannot complain about nutrient pollutants coming from the US unless we have regulations that are as stringent or more stringent than theirs.

I support regulations that restrict:

1) the amount and use of cosmetic fertilizers, also other fertilizers such as farming.

2) amount of phosphorous in detergents (household & industrial)

3) amount of phosphorous in car wash detergents

4) large scale livestock operations should be required to have their own waste treatment plant to remove nutrients just as municipalities should have in treating & disposing of human waste. (shit is shit whether human or animal). Manure should not be spread on fields unless soil tests show a need for that type of fertilizer.

5) publish the names of specific detergents and their level of phosphorous as well as if it is light or low. Just because the package says "low phosphorous" I don't know how it rates over all.

6) licence for septic systems with licence fee to cover costs of regular inspections (i.e. user pay) prohibit use of septic fields (there are too many/too dense a concentration), only septic tanks that must be pumped & trucks for disposal.

7) require all new shower heads & toilets be low flow or dual flush for toilets to decrease waste water.

8) pet wastes – "scoop the poop" is not good enough. Any pet on public property should be required to have a bag to catch waste just as was previously required of horses.

Comment 21 A & 21 B

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

9(c)

Comments:

- I would like to see more focus on reducing nutrient rich discharge from municipal sewage lagoons. Many of the rural, small community lagoons are nearing or past their expected lifespan and are in need of replacement or repair. Why not encourage including new methods of treatment ie - Constructed wetlands. in the design of new or repaired lagoons. There is a great project in Roblin MB that is successful.
- The suggestion of changing dishwasher detergents is a great idea - something easy to participate in + gets the public involved. + supporting "0" Phos. in fertilizer for lawns
- A program to address cottage owners on lakes would be beneficial - Test septic tanks, replace old leaky ones
- Reduce soil erosion - address water velocity during runoff.

102

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments: In my opinion the largest contributer to phosphorus pollution is the agriculture people. Their bottom line in the profit column is what matters to them. Farmers will fertilize wherever it's required. It doesn't matter to them if their land is on the river bank, near a ditch or on natural ~~water~~ drains.
Some Farmer continue to cultivate the back slopes of ditches and they also fertilize the same area, causing problem to the ditches and water quality
Educating the general public in the use on phosphorus is great, but I believe households are a small percentage. The whole town of Pinawa, including the golf course drain directly into the Pinawa channel, carring fertilizer into the Lee River. All government department have to be on board with the water quality problems Hydro was asked for years to flush the Lee River through the Pinawa channel, diluting the channel with more Lake water by putting a control structure on the channel and allowing more water in.

103

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

* INFORMATION SHOULD BE SENT TO MACO (MANITOBA ASSOCIATION OF COTTAGE OWNERS) THEY WOULD BE ABLE TO PASS THIS INFORMATION TO OTHER SMALLER ORGANIZATIONS (LOCAL) WHO ON THE MOST PART ON WATER FRONTAGE.
* INFORMATION SHOULD BE SENT MORE ON E-MAIL.
* TALKS TO SMALLER COTTAGE ASSOCIATIONS.

* THIS SHOULD HAPPEN IN THE SPRING OR SUMMER WHEN COTTAGE OWNERS ARE AT THE LAKE.

* CAN BE CONTACTED @ RJKRESKY@MTS.NET (DOBAL - REGENT ACTION GROUP)

104

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

9/14

Comments:

Not only homeowners need to be vigilant but restaurants, hospitals, industry etc. ~~that~~ which use more detergents etc every day than the private homeowners. We are in this together.

105

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Sept 12/2007

Comments: Good effort.

I feel that Minnesota's requirement to prove the need for soil (tested) nutrients before approved for use is a good idea & suggest this be considered for Manitoba too. especially for large urban centres where cosmetics is the lawn care goal!

*

Thanks

Sincerely

GLENN STANLEY
1279 LORETTE AVE.
WPG R3M 1V9
(452 6170)

*

PS. Too many lawn care companies; too much overspraying; unskilled applicators not well trained or knowledgable;

106

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

NCA

Comments:

- Good information
- Very knowledgeable facilitators
- It appears some cities (detergents) are ready to have Implementation plan put into place.
- Despite the fact the Open House was well publicized the attendance was disappointingly small.

107

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

GNC

Comments: Your approach is okay. but I would want to see the legislation passed before the education phase is complete. If the law is inplace and then you escalate the enforcement thru inform - warn - charge. you will accomplish your goal and your front end work won't be forgotten and the legislation that will/may be passed in the future won't be an issue. It is important now to enforce the existing laws for water systems instead of negotiating for years waiting for the issue to go away. Manitobans are ready for change. don't push off these changes until they are forgotten or it is too late.

001

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

I feel retailers could do more to inform customers regarding environmentally friendly products.

PS. the coffee was terrible!

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 21, 2007.

Thank you for your suggestions.

Comments:

As a manager of a conservation district, I understand the benefits of buffer strips. I feel that buffer strips must be made mandatory & have laws to protect them. As an example, in the CD where I work if a landowner works up a buffer strip, there is no course of action. There must be laws in place whereby tickets could be issued for such offences. Buffer strips filter out nutrients, sediment & would go a long way to protecting the provinces waterways.

If you have additional comments about reducing nutrient contributions from the application of fertilizers for cosmetic purposes in urban and rural residential areas and on reducing phosphorus contributions from household cleaning products, we would like to hear them. Your comments will further assist us in developing and implementing the most appropriate approaches.

Please fill out this comment card, secure with tape, and return by September 28, 2007.

Thank you for your suggestions.

RECEIVED SEP 28 2007

Comments: I'm sure all these phosphorus info. sessions should tell you that you need to use the media in a much more high profile campaign to educate the public about its role in phosphorus overload.

I love targeting the small guy and letting the big guys - ie "agriculture" know with massive over application of chemical fertilizer and manure. If the government was really serious about this issue it would launch a vigorous campaign to re-educate farmers and change the ethos from chemical farming to sustainable agriculture. The Consumer is asking for organic products and agriculture is way behind the times.

For open pit hog manure storage Force ILOs to treat the sewage before it goes back on the land!

111