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Sent: Monday, February 03, 2003 8:21 PM
To: Paul F. DeCarlo
Cc: kflynn@cogeco.ca; Allan Elgar; Dave Dorion; bndemo@sympatico.ca
Subject: Re: Comments re Proposed Expansion of Mid-Halton Wastewater Treatment Plant

Paul -- The Mid-Halton plant expansion is a logical extension of the HUSP study (and its environmental assessment review at the time) which basically said several years ago that urban expansion is ok to proceed in the Region. That is what is happening now. However, there is an urgent need to review the HUSP study and its conclusions as to sustainability and lack of adverse effects before we proceed with WWT expansion under the Halton Water and Wastewater Master Plan since we now have a potential crisis looming with P inputs to the nearshore waters of the Lake. The HUSP study is, I understand, currently being reviewed. At the meeting it was mentioned that the 5 year revision of HUSP had just started but there was some uncertainty as to what stage this is currently at on the part of Regional staff.

I also do not believe the original environmental assessment included looking at the adverse effect of increasing P levels to the nearshore waters of the Lake through changes in land use resulting from urban expansion.

To my knowledge the existence of the thermal bar which traps nutrients and heat in the near shore waters of Lake Ontario for perhaps two or more months in the Spring of the year was not taken in to consideration in setting P loading limits. Rather it appears from the effluent target concentrations and loadings of P, which have been set by the Province for Lake Ontario, have been arrived at by viewing the lake P loadings as a whole i.e. treated as a vast "sink" largely unaffected by gradually rising projected P loadings.

Certainly no one could have foreseen the effect of zebra mussels in enhancing the clarity of the nearshore water thus allowing Cladophora to grow at greater depths and colonize a much greater area, or the possibility that the zebra mussels may, through their feeding and excretions, recycle P or make P more bioavailable.

Hence the urgent need now , in my opinion, is to reduce P loadings to the nearshore waters from Burlington to Toronto as much as possible from all sources since a rocky shore bottom in this area provides ideal conditions for Cladophora to grow.

The amelioration of local eutrophication problems in "areas of concern " elsewhere in the Province have been addressed through just such P control and in my opinion the Burlington to Toronto nearshore deserves similar "AOC " attention.

I happened to meet by chance Murray Charlton in Burlington recently after the Halton meeting. I asked him if I was correct in assuming ,from his presentation at the meeting ,that we are on the threshold of a crisis. P levels which he presented for the nearshore appeared to me to be heading back to around 1970 levels with concomitant increase in Cladophora . He concurred and said we did not want to be in the same situation as in the 1970's , when remedial action was taken only at a very late stage.

It therefore seems to me to be only prudent to continue to be pro-active in implementing stringent P control at our WWT plants and any other sources of P from Burlington to Toronto where the rocky shore conditions for growth of Cladophora are ideal .

(Incidentally what I thought I heard Murray Charlton say in his presentation at the meeting at Halton Region was that in the nearshore waters it is not possible to pinpoint at any given time and location where the source(s) of P came from because of mixing currents along the Lake which is a little different from George's interpretation regarding contributions of point and non-point sources of P.)

Regardless of the sources of P (point source , non- point sources, atmospheric , internal sediment loading) the overall P loadings will definitely increase with urbanization unless we institute stringent P controls.

POINT SOURCES :

Increasing P loadings from WWT point sources will result from increasing volumes of waste to be treated from burgeoning populations. We each excrete approx 0.4g of total P per day. Almost all of this P ends up at our WWT plants. WWT plants are, as a result, a major source of soluble and readily bioavailable P (70- 80% of total P) . Therefore the first objective in controlling algal growth in the nearshore waters of the lake should be to reduce P loadings from WWT plant effluent sources as much as possible.

To operate the Mid-Halton plant expansion under a C of A from the Province permitting 1mg/L of P and a daily loading of 50Kg P/day for the proposed expanded Mid-Halton plant is ludicrous . Of course the Region and staff are well aware of this and have been taking steps to reduce P concentrations and loadings from all our WWT plants to well below their respective C of A limits. However, I do not believe either the Region or the Province has perceived an urgent need to enact really stringent control on P levels at the present time. My reason for believing this is that statements made regarding the expansion of the Mid-Halton plant indicate that total loadings of P to the Lake would not go up from present levels but would remain about the same -- at least that is what I think I heard David Ohashi say and this has also been my impression from earlier conversations with Region staff . In other words P loadings would keep up with any expansion in population and in the longer term it might be possible to reduce P levels further.

It should be kept be kept in mind that the theoretical conversion of P to wet weight of algal biomass should be multiplied by a factor of approx 500 -- i.e. for every Kg of bioavailable soluble P , 500Kg in wet weight of algal biomass could be produced with no other nutrients required -- the only other requirements being adequate sunlight and temperature for algal growth to occur. In other words up to 1 metric ton of algal biomass could be produced for every 2Kg of soluble P discharged. With current loadings of around 25Kg/day of mainly soluble P from the Mid-Halton and SW plants alone there is considerable potential for massive algal growth to occur locally under the right climatic conditions.

If we were to reduce effluent concentrations at the Mid-Halton and SW to say 0.15mg/L total loadings would decrease to about 9 Kg /day or about one third present levels assuming no increase in connected population/ sewage flow. While one cannot say with certainty that this would eliminate or even reduce the algal problem I believe there is a chance that the the nearshore Lake water P concentrations may through dilution reduce to a level of less than 20 to 30 micrograms per litre. It is generally considered that a body of water will change from an oligotrophic condition to eutrophic (algal producing) conditions at levels above 20 micrograms per litre of available P.

I would like to see Halton and the Province treat P loadings from WWT plants discharging to the nearshore waters of the lake in the same way as P loadings from the Milton plant, where there is a P loading limit designed not to cause eutrophication in the receiving water (Sixteen Mile Creek) .i.e. to P levels below that where eutrophic conditions occur.

With a projected increase in population in Oakville of nearly 20% by 2008 I think there is an immediate requirement for drastic remedial action to be taken since we already have an algal problem at existing P levels.

NON- POINT SOURCES:

There is always going to be debate over the relative contribution of P from non-point sources as opposed to point sources. In the absence of sufficient local watershed data I extracted the following from a US study of 928 non-point source watersheds :

As mentioned to you in recent correspondence I came across an article on the transference of P from terrestrial to aquatic systems. This study and the figure which I have re-copied as an attachment(Omernik, 1977) was designed to show the phosphorus loss in runoff as a function of land use in the U.S.

This U.S. survey of 928 non-point source watersheds in the U.S. (Omernik, 1977) shows that P export increased as the proportion of land as forest decreased and as agriculture increased. What I found really interesting though was the importance of forest and range land (or a mix of the two) in controlling P losses in runoff. The increased P losses from conversion to only 40% urban use is quite evident. It will be noted that the total P losses per hectare per year from only 40% conversion to urban use exceeded that from either 50% or 90% agricultural use and is almost double that of the other range and forest mixes shown in the diagram.

In Halton/Oakville for example only 500 hectares out of some 3000 hectares is being protected in the OPA 198 development (i.e about 80% urbanization) and some of that land is on the Oakville moraine. In addition the Ontario Realty Corp. proposes to sell off 300 out of 445 hectares of mainly forested land owned on the Oakville moraine to developers.

While extrapolations from the figures shown may not be altogether valid it would look as if conversion to 80% urbanization probably would more than double the non-point P losses in grams per hectare per year if we assume previous land use was primarily agricultural ,and much more than that if compared to forest/range land uses.

The potential for such increased P losses through urbanization within Halton and the adverse affect this would have on the Lake may not have been considered in the original HUSP study. Storm water run-off and control and sub -surface watershed effects would have been considered in the review but I doubt if potential for increased P losses and possible effects on the inshore waters of Lake Ontario were studied.

There are offsetting factors which should be mentioned which diminishes to some extent the potential contribution of P from non-point sources to algal growth.

These are:

Phosphorus in runoff and erosion from the landscape occurs as particulate phosphate (PP) and dissolved phosphate (DP). Generally PP is the major portion (75-90%) of phosphorus transported in runoff and erosion from land. The PP primarily consists of sediment and organic matter and contains both organic and inorganic phosphorus but it should be noted that only about 20 to 40% of sediment inorganic P is potentially bioavailable according to some researchers. As mentioned previously, dissolved P is considered the most available form of P for algal growth (strictly speaking the bioavailable soluble reactive P which is the DP and a portion of the PP)

It was observed many years ago by the late Dr. AE Berry of the OWRC that algal related water problems in the Province arose from the three P's -- People , Pollution, Phosphorus . I submit that more stringent P control is now required in Halton Region and a phased or controlled urban expansion be implemented based on being able to maintain P levels below the threshold where nuisance algae occur in the nearshore water of the Lake.

A fourth P for providing a solution to the problem should be added and that is P for Politicians. Councillors Allan Edgar and Kevin Flynn are trying valiantly at their own expense to draw attention to and educate us about the problems arising from growth in the Town and Region . They need assistance from other Councillors to persuade the Town and the Region that we need to involve and seek the assistance of Provincial and Federal Politicians. No presentation of facts

or further scientific studies or "smart growth" will really matter if there is no political will to even consider, let alone fund, solutions to the environmental problems being created from Federal/Provincial mandated population growth in our Region. The Town and Region cannot and should not have to contend alone with environmental problems created by trying to fulfil Provincial/ Federal mandated urban growth.

Of course remedial action will cost money but I think at the local level most people would accept increased municipal taxes to protect or improve the existing environment through more stringent controls. However, I do not think citizens would readily accept the projected costs of urban growth and enhancement of our present problems if the figure of a 47% increase in Regional taxes over the next few years, mentioned at the Halton meeting, was presented to them. I think the Town and the Region should be asked (actually challenged) to publish for public comment those projected non-recoverable costs associated with urban growth development and their affect on municipal taxes over the next few years. Development charges seem to be woefully inadequate in recovering even partial costs from developers. I notice that recently in Halton Hills there were proposed increases ranging from over 100% to over 700% in development and planning fees and this would bring cost recovery to only 75% (previously 27.5%). The Town and Region have always said to us that growth costs money but have never said, to my knowledge, how much. I think we need to see the projected near term and long term projections and the cost recovery from developers with dollar figures attached. I suspect there may be a public outcry and taxpayer revolt if and when they see these figures.

Most of the above is peripheral background appropriate to the Algae Forum and is really a questioning of why there should be a Mid-Halton plant expansion at this time before we have had time to solve our present P related algal problem. I shall attempt in a further e-mail before the deadline for comment to present more specific comments and questions on the actual proposed plant should it be built, particularly with regard to the proposed sludge handling which I think poses another large environmental problem no matter which preferred sludge handling option is selected.

If you Paul, David, Brian, Allan or Kevin want to further disseminate this e-mail, or abstract portions of opinions I have expressed, please feel free to do so.
Thanks, Duncan

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