



Deputy Minister  
Health and Welfare Canada

Sous-ministre  
Santé et Bien-être social Canada

COPY FOR CENTRAL REGISTRY

*P. A 850-5-X751*

*Sent to DM's  
office on 2-12-76*

Your file    Votre référence

Our file    Notre référence

Mr. J.B. Seaborn,  
Deputy Minister,  
Department of the Environment,  
14th Floor,  
Fortin Building,  
OTTAWA, Ontario.  
K1A 0L3

Dear Mr. Seaborn:

Thank you for your recent letter to Mr. Lupien concerning sewage disposal at Yellowknife, N.W.T.

Although the N.W.T. Water Board passed a resolution on September 7 against increasing use of Kam Lake as a sewage lagoon, this must be contingent on the discovery of some practical alternative which meets reasonable engineering, health and aesthetic standards.

For the present it is understood that both Kam and Nevin Lakes are functioning satisfactorily as sewage lagoons and no serious problems are being encountered.

As you are aware there are differing opinions on the weighting of existing research results, and various inferences as to how they should be interpreted in respect to our knowledge of Kam Lake. All appear to agree that Nevin Lake is functioning satisfactorily in spite of overloading.

The low operating costs of lagoons impresses the civic and territorial governments. My officers are reluctant to support alternative high cost facilities which may not be necessary and which may not be practical considering local official attitudes. The existing situation is satisfactory from a health standpoint.

Yours sincerely,

Bruce Rawson

WHF/mb  
Typed on December 2, 1976

Ottawa K1A 0K9

Ottawa K1A 0K9



Ottawa, Ontario  
K1A 0H3

NOV 12 1976

750-5-X751

NHW - RECORDS SERVICES DIV. ADMIN. BR. RECORDS OFFICE	
Referred to	<i>Wn/Health</i>
File No.	15 NOV 1976 1000-5-11
Chg'd. to	

Mr. Jean Lupien  
Deputy Minister  
Department of National Health  
and Welfare  
Brooke Claxton Building  
Ottawa, Ontario

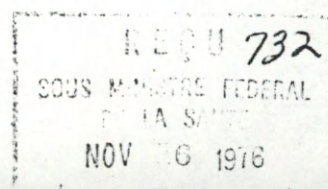
Dear Mr. *Jean* Lupien:

Sewage Disposal for the City of Yellowknife

I am writing to acknowledge receipt of your views (letter of September 8) regarding sewage disposal for the City of Yellowknife, and to indicate my surprise on reading some of the concerns as you have expressed them. Although I don't want to appear to belabour the point, I should like to reiterate the position we took with the Water Board that:

- The use of Kam Lake, Unnamed Lake and Mac Lake as sewage lagoons are the least desirable of all of the sewage alternatives considered to date in that such a use would destroy the fishery and recreational value of these lakes and seriously reduce the potential of the surrounding area for recreational and residential use. In addition, Kam Lake would not function adequately as a sewage lagoon.
- Regardless which of the alternatives identified by the Water Board is chosen, continuous monitoring of the influent sewage and the effluent should be undertaken to ensure that the sewage treatment facility is providing the desired level of treatment. Also continuous monitoring of the receiving water should be undertaken to ensure that the level of sewage treatment being provided is adequate to protect the desired uses of the receiving waters.

We have never advocated disposal of comminuted sewage into Yellowknife Bay even with chlorination and if the Water Board considers such a scheme, my Department will support your opposition to it. However, we can see no real basis for any suggestion that adequate sewage treatment, in this case, will involve facilities which are beyond the capability of the City of Yellowknife to operate.





I am surprised, also, to read the suggestion that "there is a surplus of outstanding recreational lakes in the immediate vicinity of Yellowknife" and that the amount of arsenic in Kam Lake would be relatively unimportant in the presence of ever increasing amount of sewage discharged directly into the lake. I don't believe these are credible arguments for the position that discharge of essentially raw sewage into Kam Lake is an acceptable solution.

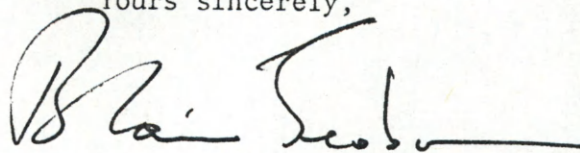
Your Department also expressed a concern regarding the high cost of mechanical treatment and the possible reallocation of funds from other higher priority projects to finance the installation of these facilities in Yellowknife. Our Department is cognizant of this problem and in our correspondence with the Department of Indian Affairs and Northern Development we have requested that "new funds" be made available to avoid any deceleration of other urgently needed municipal servicing programs in the Territories. It should be noted that, at the June 24 Public Hearing on sewage disposal, the citizens of Yellowknife expressed their desire that the City construct and operate a properly designed sewage disposal facility.

At this point in time, I am advised that the important question relates to the adequacy of mixing provided by surface and sub-surface currents in Yellowknife Bay. This, to a large degree, will form the basis for judging the adequacy of various treatment options to protect public health as well as the receiving environment.

*Mixed or not it still sewage*

I trust that members of our respective staffs can work effectively together within the context of the Water Board's September 7, 1976, decision not to allow the use of Kam Lake for sewage disposal and, using all pertinent information available, come to a mutually acceptable solution to the sewage disposal problem in Yellowknife.

Yours sincerely,



J.B. Seaborn



No shortage of Lakes  
for recreation

Seaplane  
Base

Sanikilille

Yellowknife

Excellent for  
sewage  
purification

Peter Baker  
Shore

Little or no flushing  
action from Yellowknife  
River in summer,  
fall or winter.

Indians dig  
and drink this  
water  
Bay

Dumping Sewage here should be  
prohibited even with primary treatment  
and chlorination.

G R E A T

S L A V E

Redrock  
Point



p-505

050-5-X751

SEP - 8 1976

Mr. J.B. Seaborn,  
Deputy Minister,  
Environment Canada,  
14th Floor,  
Fortin Building,  
OTTAWA, Ontario.  
K1A 0L3

Dear Mr. Seaborn:

Sewage Disposal for the City of Yellowknife

Thank you for your recent letter and copy of the DOE brief to the Northwest Territories Water Board which was presented at a public hearing in Yellowknife on 24 June.

My departmental representative on the Water Board, Dr. W.H. Frost, has attended most of these deliberations and is generally of the view that sewage lagoons of adequate size work satisfactorily in the Northwest Territories and other systems can cause major engineering and maintenance problems. These include freezing, overflowing, prolonged mechanical breakdowns and the need to be heated in the winter. Our specific comments are as follows.

The recreational advantages of Kam Lake are recognized and if Kam Lake were the only lake with similar advantages in the vicinity of Yellowknife its preservation for recreational purposes would be of more importance but there are so many lakes in proximity to Yellowknife, some already partially developed for recreation, that Kam Lake's importance for recreation is diluted and the City gives it a low priority. Furthermore, as you are aware, Kam Lake has been contaminated over the years by frequent seepages of Con Mine tailings from Pud Lake and, in the past few years, by its use as a sewage lagoon by the City of Yellowknife to serve a nearby district of the city on a continuous basis and on occasion to take the city's total flow of sewage to prevent flooding from the city sewers when pumps to Nevin Lake were inoperative. No health problems have resulted from this. Drainage from Kam Lake is toward the southwest by way of Unnamed Lake and Mac Lake into swampland which is very suitable for the natural purification of sewage. No contamination of Great Slave Lake or other waters in close proximity to Yellowknife would occur.



From a health standpoint there are no serious objections to disposal of sewage into Kam Lake. It would be as safe and as satisfactory as disposal into Nevin Lake has been over the years since 1948 until recently, when the latter lake became too small to accommodate the increased amounts of sewage from a rapidly expanding population. An excellent growth of green vegetation surrounds Nevin Lake which contrasts with the bare rock surrounding most other lakes.

On the other hand, disposal of comminuted sewage into Yellowknife Bay would not be acceptable from a health standpoint. It would be unacceptable even with chlorination, since this would not be adequate to make the water safe for use by Indians and others who live near the shores of the Bay. During fires and periods of high demand, water from the Bay is pumped into the water mains of the City of Yellowknife. Amoebic Dysentery has reached as far north as Snowdrift in the Northwest Territories. Amoebic cysts are known to be resistant to chlorination.

We do not favour the proposal to discharge sewage into Pud Lake. Pud Lake is used by the Con Mine for containment of tailings saturated with arsenic and cyanide salts. Minimal outflow is desirable. Increasing the inflow of liquid by adding water from the sewers would increase the outflow which ultimately reaches Great Slave Lake. Large amounts of sewage and the very large amounts of arsenic which have accumulated over the years are not a desirable combination especially if reduction of pentavalent arsenic to trivalent arsenic compounds occurs extensively. Large amounts of sewage could reduce the containment of arsenic.

With regard to secondary treatment of sewage with nutrient removal followed by chlorination and subsequent discharge into Kam Lake, we have no objections from a health standpoint. However, we do not wish to support this recommendation for several reasons. One would relate to the high cost as compared to the local government proposal which would be relatively inexpensive and adequate to protect health. Another relates to our doubts that the City of Yellowknife has the capability of operating secondary treatment facilities on a continuous basis under local conditions. Raw sewage would be dumped into the lake frequently.

The proposal to convert the Southern Third of Kam Lake into a sewage lagoon is a variation of the local government plan, the advantages and disadvantages of which are not entirely apparent at present. According to Reid, Crowther and Partners Limited Report (1976), the dam would have to be constructed from shot rock which appears to be the only practicable material available. Such a dam would be pervious, expensive and impracticable to render water-tight. The surface area of the lagoon would be reduced from 524 acres to 170 acres if Dam Site No. 3, which is recommended, is chosen. The average retention time would be reduced to 180 days. During May it could go as low as 46 days, whereas retention periods up to 365 days are desirable. A saving feature, however, is the swampland (Peter Baker Slough), southwest of Maa Lake, which would function well during the long daylight hours during May, June and July. The construction of a porous rockfill dam would not guarantee the recreational value of the northern two thirds of Kam Lake.



Mr. J.B. Seaborn

The deficiency of top soil over the irregular surface of the Precambrian Shield makes the installation of sewer extensions outside the city difficult and costly and the use of natural water courses in such rugged terrain is convenient and economically reasonable.

The location of Kam Lake is convenient for sewage disposal and for conveying the liquid to swampland for purification before it reaches Great Slave Lake. No lengthy pipelines need to be constructed through miles of solid rock. The sewers to Kam Lake have already been installed by the city at a cost of \$2,213,000.

There is a surplus of outstanding recreational lakes in the immediate vicinity of Yellowknife and the City has set its priorities with the support of the Territorial Government.

The persistent seepages of Con Mine tailings from Pud Lake to Kam Lake over the years have increased the arsenic content of Kam Lake and its marine life making the consumption of fish from Kam Lake undesirable, but the amount of arsenic in Kam Lake would be relatively unimportant in the presence of ever increasing amounts of sewage discharged directly into the lake.

There are methods of dealing with eutrophication in Kam Lake in future if this becomes a problem. The problem at Nevin Lake is chiefly due to overflow to Back Bay caused by the increase in population.

My department is responsible for the provision of advice to the Commissioner of the Northwest Territories in matters affecting the public health. Kam Lake was selected by our Public Health Engineers and Engineering Consultants as a suitable place for sewage disposal. Considerable planning and work took place before the Northern Inland Waters Act was passed. We have now reached the point where the Northwest Territories Water Board must reach a decision on the basis of the evidence presented by the public, by its technical committee and by the various government agencies.

I appreciate your bringing this matter to my attention and thank you for the opportunity of exchanging views.

Yours sincerely,

ORIGINAL SIGNED BY  
ORIGINAL SIGNÉ PAR

Jean Lupien

Jean Lupien.

sbn

TYPED AUGUST 27, 1976.

WHF/sbn





Ottawa, Ontario  
K1A 0H3

AUG  
AOU - 6 1976

Mr. J. Lupien  
Deputy Minister  
Department of National Health and Welfare  
General Purpose Building  
Ottawa, Ontario

NIHW - RECORDS SERVICES DIV. ADMIN. BR. RECORDS OFFICE	
Referred to	<i>P. J. H.</i>
3 AUG 1976	
File No.	1000-5-11
Chg'd. to	

Dear Mr. Lupien:

SEWAGE DISPOSAL FOR THE CITY OF YELLOWKNIFE

Enclosed for your information is a copy of the DOE brief presented to the Northwest Territories Water Board public hearing held on June 24, 1976, at Yellowknife.

As you are probably aware, the City of Yellowknife has applied to the Water Board to convert part of Kam Lake, Unnamed Lake and Mac Lake to sewage lagoons. From the viewpoint of long term environmental management, Environment Canada considers that the conversion of all or part of these recreationally useful, fish inhabited lakes to sewage lagoons is the least desirable sewage disposal alternative.

The City of Yellowknife, aside from being the capital of the Northwest Territories, represents the headquarters of activity for the Federal government in the Territories. We are therefore very concerned about the potential negative precedent that may be set should the least cost sewage lagoon alternative proposed by the City be endorsed. Furthermore, we fear that the establishment of such a precedent would seriously jeopardize our on-going activities to promote the adoption of sound environmental management practices by other municipalities, particularly those in the North.

Environment Canada would therefore appreciate any support and/or endorsement that your Department can provide for our recommendation that the City of Yellowknife install a properly designed and located sewage treatment plant.

Your consideration of this urgent matter is greatly appreciated.

Yours sincerely,

*J.B. Seaborn*  
J.B. Seaborn

Enclosure.

RECU 505
SOUS-MINISTRE FEDERAL DE LA SANTE
AUG 9 1976
DEPUTY MINISTER OF NATIONAL HEALTH
RECEIVED





Deputy Minister  
Health and Welfare Canada

Sous-ministre  
Santé et Bien-être social Canada

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Bruce Rawson

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Typed on December 7, 1976.