



Government  
of Canada

Gouvernement  
du Canada

# MEMORANDUM

# NOTE DE SERVICE

TO  
À  
Director General  
Program Management  
Medical Services Branch

FROM  
DE  
Regional Director  
Northwest Territories Region

ACTION			PA date	BF date
M 14				
INFORMATION				
M 67	M	M		
M	M	M		
M	M	M		

SECURITY - CLASSIFICATION - DE SÉCURITÉ
OUR FILE - N/RÉFÉRENCE 150-5-M (N1)
YOUR FILE - V/RÉFÉRENCE
DATE April 28 1975

SUBJECT  
OBJET

YELLOWKNIFE SEWAGE DISPOSAL

Further to my memo of April 23rd, I enclose herewith further information on the above subject which may be of interest to you, for your information.

F. J. Covill, M.B., B.S., M.F.C.M., D.P.H.  
Regional Director

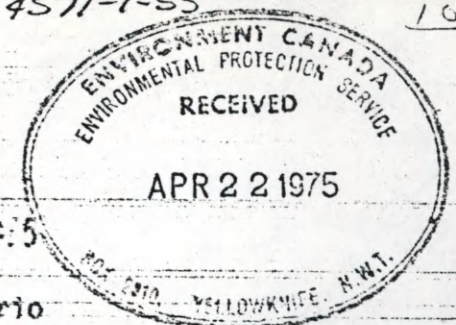
Enc.







205583

Deputy Minister  
Environment CanadaSous-ministre  
Environnement Canada

APR 22 1975

Ottawa, Ontario  
K1A 0H3*Chand**Copy TO*
*G. B. Brumfield*  
*U. C. Wright*  
*M. Handlin*  
*R. Creery*  
*Dr. EATON*  
*CAW*
*City of K. full*
*DISTRIBUTED TO*  
*MEMBERS - NWT*  
*WATER BOARD*  
*April 22/75*  
*CAW*

Mr. A. Kroeger,  
Deputy Minister,  
Department of Indian & Northern Affairs,  
Centennial Tower,  
400 Laurier Avenue, West  
Ottawa, Ontario  
K1A 0H4

Dear Mr. Kroeger,

SEWAGE DISPOSAL FOR THE CITY OF YELLOWKNIFE:

As you may be aware the City of Yellowknife is actively pursuing a course of action which would lead in the near future to the discharge of untreated municipal sewage from the entire City to Kam Lake. This course of action was approved as a possible interim measure by Environment Canada and Health and Welfare Canada in 1971.

Recently, at the request of the City of Yellowknife, officers of this Department and Health and Welfare Canada have reviewed the consequences of this proposed action. It has been determined that Kam Lake supports a viable fish population, offering recreational potential, which would be destroyed if this course of action is pursued. Therefore, this action is now unacceptable to Environment Canada. Furthermore, I am advised that Health and Welfare Canada is opposed to this course of action because of public health concerns and had so notified the city prior to recent construction activity.

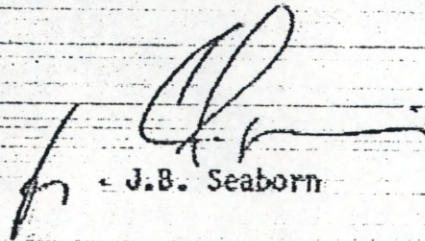
In view of the federal jurisdictions, leadership, and responsibilities in the Northwest Territories it would be undesirable to create an environmentally unsound precedent which would be in conflict with stated federal policies and priorities.



I would, therefore, ask that we co-operate in actively seeking acceptable alternatives to resolve the above situation, realizing that additional Government funding to the City of Yellowknife will likely be necessary. Although Environment Canada's support in this area is restricted to the demonstration of innovative technology, we are familiar with applicable Government financial assistance programs and would be pleased to co-operatively examine alternatives with members of your staff.

I would, therefore, request that a decision on the licence be postponed for a month or so, in order that alternative courses of action can be examined.

Yours sincerely,



J.B. Seaborn





Indian and  
Northern Affairs

Affaires indiennes  
et du Nord



P.O. Box 1500  
Yellowknife, N.W.T.

March 20, 1975

Your file Votre référence

Our file Notre référence

4530-2-1

Mr. M. Hardin

MEMBERS

N.W.T. WATER BOARD

Re: CITY OF YELLOWKNIFE - TECHNICAL  
COMMITTEE MEETING

Attached for your information is a copy of the minutes of the Technical Committee Meeting which was held on March 11, 1975 concerning the City of Yellowknife's Water Application. Could you please review the recommendations as they will be discussed at the next Water Board Meeting in April.

If you or your Technical Committee member has any comments pertaining to the minutes or recommendations, please advise the undersigned.

Yours truly,

*N.A. Jacobsen*

N.A. Jacobsen

A/Controller of Water Rights

N.W.T. Water Board

cc. H. Monaghan (Terr. Gov't)  
✓cc. M. Hardin (EPS)  
cc. E. Ristan (N.H.&W.)

TO → D.R. EATON

Copies sent

to Pick  
Brumhill  
Fowler  
& Venn C.

MAR 24 1975

Dr. Eaton



N.W.T. WATER BOARD TECHNICAL COMMITTEE

CITY OF YELLOWKNIFE

Recommendations to the N.W.T. Water Board

concerning the

Issuing of a Water Licence

for

City of Yellowknife

Yellowknife, N.W.T.

March 11, 1975



MINUTES

TECHNICAL COMMITTEE

MEETING #22

CITY OF YELLOWKNIFE

Bellanca Building, Yellowknife, N.W.T.

1:30 p.m. March 11, 1975

PRESENT:

A.G. Redshaw  
N.A. Jacobsen  
E. Ristan  
G. Woodget  
Dr. Eaton  
M. J. Hardin  
R. Wallace  
G.J. Brunskill  
S. Hrudey  
H.J. Monaghan  
A. Cronk  
J. Kraft  
B. Forsythe  
B. VanHees

Chairman, (DINA)  
Water Management, (DINA)  
Member (N.H. & W.)  
E.H.O. (N.H. & W.)  
Prog. M.O. (N.H. & W.)  
A/Member (DOE)  
EPS (DOE)  
Fisheries Research (DOE)  
EPS (DOE)  
Member (Gov't of N.W.T.)  
Local Gov't (Gov't of N.W.T.)  
Works Superintendent (City of YK)  
Ass't Works Supt. (City of Yellowknife)  
Reid Crowther & Partners Ltd. (YK)

Mr. Redshaw opened the meeting and outlined the agenda as follows:

1. Outline of terms of reference of Technical Committee.
2. Review of water application
3. Presentation by City of Yellowknife on water supply and waste disposal facilities.
4. Discussion
5. Development of Recommendations to Water Board.



## RECOMMENDATIONS

Subsequent to the meeting of N.W.T. Water Board Technical Committee held on March 11, 1975 concerning the City of Yellowknife's water application, the following joint committee recommendations are made to the Board.

### Water Supply

1. The Technical Committee recommends that the Board require that the City institute a water quality monitoring program at each of the following locations:
  - a) Yellowknife River at intake
  - b) Intake at main pumphouse to Back Bay
  - c) Treated water
2. The Technical Committee recommends that the Board indicate that it is the City's responsibility to conduct the monitoring and carry out the required analyses as in (1) above.
3. The Technical Committee recommends to the Water Board that since the Yellowknife River watershed is the source of supply for the City that any activities within the water shed involving waste disposal be examined and monitored closely to avoid detrimental effects to the watershed which may affect the City's water supply.
4. The Technical Committee recommends that the Water Board request the Territorial Government re-examine the Yellowknife Watershed Development Ordinance in light of future developments in the area.
5. The Technical Committee recommends that the Water Board request that the City install a meter at the river intake and maintain accurate flow records of water usage.
6. The Technical Committee recommends that the Board require that the City provide to the Water Board an accurate water balance which should include water distributed to each of the two mines and the City.
7. The Technical Committee recommends that the Water Board request that the City ensure that the treatment facilities be up-graded as necessary to ensure adequate chlorination of all water used by the City residents including the emergency water supply which is taken from Back Bay.



Outline 19-1

Review of Application  
19-2

Mr. Redshaw outlined the terms of reference of the Technical Committee and the terms of outlines were distributed to the persons that were present at the meeting.

Mr. Jacobsen outlined the content of the water application which was received on December 15, 1972. It is noted that the city had applied for 1,000,000 gallons per day with an expected water use of 3,000,000 gallon per day within 5 years. It was also pointed out that approval had been given by various Government agencies for the construction of the pipe-line to Kam Lake prior to the Northern Inland Waters Act coming into effect.

Presentations by City  
19-3  
Water System

Jack Kraft outlined the present water supply and distribution systems serving the city. He pointed out that the present water use is between 850,000 to 900,000 gallons with a present population of approximately 8,500. Mr. Kraft estimated that the water usage within the city would probably be in the range of 2,000,000 gallons per day in the next 5 years. It was pointed out that in 1974 water delivered by truck amounted to approximately 300,000 gallons per month during the winter. During the summer, approximately 250,000 gallons per month is distributed by surface lines and approximately 100,000 gallons per month delivered by truck. Mr. Kraft indicated that over the past two months, emergency pumping from Back Bay had occurred only for a total of 18 minutes.



Mr. Kraft and Mr. VanHees outlined the present sewage collection and disposal systems. Details of the present systems were outlined as well as proposals for future development. Mr. Kraft indicated that the new lift station in Forest Park Subdivision will be operational within a month. He estimated that by June all of the sewage from the City of Yellowknife will be discharged into Kam Lake. The pumped out sewage is now being discharged into the main lift station and Mr. Kraft indicated that in the future this sewage would be discharged into Kam Lake through a man-hole near the out-fall. It is noted that at present, some storm water can enter the sanitary sewer system due to direct connections with catch basins and discharge from some basement sumps.

Discussion 19-4

Mr. Kraft was questioned on the amount of water which was being distributed to each of the two mines by the City and agreed to submit this water usage data. Mr. Jacobsen pointed out that an accurate water balance would be required and that the City will be licenced for all of the water taken from the river including that portion sold to the mines.

Mr. Wallace questioned the use of Back Bay as an emergency water source.

Mr. Kraft indicated that, of the total water supply to the City, only an infinitesimal amount is taken from the Bay. However, with the present treatment facilities, chlorination of this



Discussion 19-4

source may not be adequate.  
Dr. Eaton also expressed some concern  
in this regard.

Discussion followed on the desirability  
of using Kam Lake as a receiving  
body for sewage. Mr. Kraft and  
Mr. VanHees outlined the difficulties  
of converting the present sewage  
systems and revising future designs to  
alter the City's concept of discharge  
of all the City's sewage to Kam Lake.  
Following this discussion, Mr. Kraft,  
Mr. VanHees and Mr. Forsythe left  
the meeting to allow the Committee to  
formulate recommendations to the  
Water Board.

Recommendations  
to the Water Board  
19-5

See attached recommendations to the  
Water Board.

The meeting was adjourned at 5:00 p.m.



8. The Technical Committee recommends that the City upgrade their chlorination facilities at the main pumphouse to ensure that they satisfy safety standards under legislation.
9. The Technical Committee recommends that the Water Board require the City to install an automatic water level recorder at the Yellowknife River intake to monitor seiche influence from Yellowknife Bay.

Waste Disposal

1. The Technical Committee recommends that the Water Board require The City to demonstrate that Kam Lake will operate efficiently to <sup>down</sup>grade sewage and organic matter produced in the lake by the sewage nutrients to a quality comparable to secondary treated effluent with an organic loading from 15,000 people.
2. The Technical Committee recommends that the Board request the City to evaluate all true costs of utilizing Kam Lake as a sewage lagoon including devaluation of lands for potential development as well as recreation potential.
3. The Technical Committee recommends that the Water Board request the City to seriously consider alternative sewage disposal schemes.
4. The Technical Committee recommends that the Water Board require the City to <sup>evaluate</sup> ~~demonstrate~~ the environmental impact of these alternative schemes on the receiving waters.
5. The Technical Committee recommends that the Water Board require the City to submit the terms of reference for any studies to be undertaken under (4) above to the Water Board for approval prior to implementation.
6. The Technical Committee recommends that the Water Board require the City to initiate on an interim basis contingency measures to minimize sewage flows to Kam Lake and include only existing discharges and discharges from present and future developments in Forest Park until a resolution is issued. It is also recommended that the City be required to monitor the quantity and quality of sewage being discharged to Kam Lake.
7. The Technical Committee recommends that the Water Board meet with representatives of the City to discuss the above recommendations.



8. The Technical Committee recommends that the Water Board hold a Public Hearing soon, and if possible prior to the initiation of studies in order to ensure that public opinion is voiced and considered.

The Department of Environment representatives at the meeting pointed out that the Kam Lake Review is not to be considered as a feasibility study in support of the City's application for the use of Kam Lake as a lagoon but rather an assessment of the lake and a summary of the positions of DOE and N.H. & W. with respect to the use of Kam Lake.

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MEMORANDUM NOTE DE SERVICE

DATE April 24, 1975

FROM:  
DE:

C. A. Lewis, District Manager  
Environmental Protection Service  
P.O. Box 2310  
Yellowknife, N.W.T.

Our file Notre référence

4045-1/Ye

TO:  
A: A. Pick, Chief  
Environmental Conservation Branch  
Environmental Protection Service  
Edmonton, Alberta

Your file Votre référence

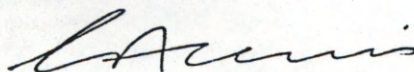
SUBJECT:  
SUJET:

RE: KAM LAKE - CITY OF YELLOWKNIFE SEWAGE  
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At the April 22/75 N.W.T. Water Board meeting, I suggested that it would be useful if your review committee could meet with the Board, answer questions regarding the report and update the members on any new information (ie. experiments by Dr. Brunskill on sewage breakdown).

The Board has asked me to invite you and your review group to the next meeting -- the afternoon of May 27/75 in Yellowknife.

This is a key strategy move as I see it and for this reason I'd appreciate your confirming attendance of the group.



C. A. Lewis  
District Manager

cc: J. Eatock  
Dr. R. Eaton ✓  
Dr. G. Brunskill  
Dr. D. Lane  
M. Hardin  
P. Given  
J. Bell



MEMORANDUM NOTE DE SERVICE

DATE April 24, 1975

FROM: C. A. Lewis, District Manager  
DE: Environmental Protection Service  
P.O. Box 2310  
Yellowknife, N.W.T.

Our file Notre référence

4045-1/Ye

TO: A. R. Pick, Chief  
λ: Environmental Conservation Branch  
Environmental Protection Service  
Edmonton, Alta.

Your file Votre référence

SUBJECT: RE: CITY OF YELLOWKNIFE - KAM LAKE  
SUJET: -----

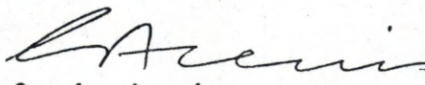
At the April 23/75 meeting of the N.W.T. Water Board, it was decided that the Chairman, on behalf of the Board, would write the City on the following points:

- (1) Request them not to increase the sewage load to Kam Lake or show cause (and receive Board approval) why continuance of discharge into Niven Lake should not continue in the interim.
- (2) That studies demonstrating that Kam Lake will operate efficiently to downgrade sewage will be carried out and that studies exploring alternative sewage disposal schemes also be carried out. Terms of reference for the studies will have to be approved by the Board.

I expect that this direction will result in some meetings with the City and I'd like your assurance that appropriate Regional staff could be made available on request.

No date was set for a public hearing.

The next Board meeting is May 27, 1975.

  
C. A. Lewis  
District Manager

cc: J. Eatock  
Dr. R. Eaton ✓  
V. Christensen  
M. Hardin  
Dr. G. Brunskill  
S. Hrudey



205051

RECEIVED  
NORTHERN REGION  
MEDICAL SERVICES

Dr. EATON.

## Kam Lake no laughing matter

APR 28 '75

Dear Sir:

I feel obliged to reply to your April 16-75 article captioned "Council laughs off objections to sewage lagoon."

The reported reaction of SOME members of City Council suggests to me a certain lack of appreciation of the long term implications of using Kam Lake for untreated sewage disposal.

To set the record straight, Environment Canada was asked by City Council on September 25, 1974 to "conduct a study as to the biological effects of this usage of Kam Lake on the sewage, fish, water and environment."

A group of highly qualified scientists, and sanitary engineers (including representation from Health & Welfare Canada) examined the proposal and made their report which is now a public document.

Major points in the report were as follows:

1. "...the discharge of sewage to Kam Lake would undoubtedly create a significant potential hazard to public health by establishing a microbiologically contaminated water body in close proximity to major residential areas."

2. Oxygen depletion will occur, increasing the production of arsenite from arsenate (two forms of arsenic), a phenomenon that "will likely impede sewage degradation in the lake."

3. There is a significant arsenic problem identified in Kam Lake but the causes appear to be under control and could result in the recovery of the lake in about 20 years (assuming no sewage is added).

4. A number of alternatives were explored and it was the opinion of the review group that probably "discharge to Great Slave Lake, after treatment, through a properly designed and located long outfall, would be acceptable wastewater treatment."

As further background, it was pointed out that the approach of the City is not consistent with recommendations of its own consultants who in 1971 recommended "adequate treatment" before discharge to Kam Lake.

Further, the City consultants examined various alternatives for treatment systems at four sites: Niven Lake, Yellowknife Bay Pud Lake (currently used by Con Mine for tailings effluent), and Kam Lake. The least expensive alternative was Kam Lake based on the following provisions as extracted from the consultants' report:

i. "The area surrounding the Lake is not contemplated for development in the foreseeable future..."

ii. "Treatment must be adequate to prevent occurrence of nuisance or health hazards, and in addition, should be such that no irreversible changes were wrought to the Lake..."

iii. "...it might be possible and worthwhile at some time in the future to overcome the arsenic pollution now in Kam Lake and thus create new value for the Lake and its environs as a development area."

iv. "Provision for advanced treatment as may be required or desirable in the future to permit its reclamation for development purposes..."

My basic point is that the City should, through its consultants, seriously review the entire situation in the light of current information, including a cost and engineering evaluation of the alternatives suggested.

This will clearly indicate to the citizens of the Capital of the N.W.T. that their elected representatives are taking a responsible approach to a question that has serious long term implications that a future City Council may have to face.

Sincerely,  
C.A. Lewis,  
District Manager  
Environment Canada  
Yellowknife, N.W.T.

NEWS OF NORTH  
April 23/75