

## DEPARTMENT OF NATIONAL HEALTH AND WELFARE

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## INTRADEPARTMENTAL CORRESPONDENCE

Dr. G.D.W. Cameron,  
Deputy Minister of National Health.

File No. C-455-10-13

Date: January 5th,  
1950

Subject:

Summary of Information on Arsenic at Yellowknife.

DEPUTY MINISTER OF  
NATIONAL HEALTH

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The problem from a health point of view involves environmental pollution in the organized and populated area of Yellowknife, as a result of ore-roasting operations at two mines - Consolidated Mining and Smelting Company's Con and the Giant Yellowknife mine. In addition it was stated that other mines in the area will commence operations and adopt a similar ore-roasting process in the future.

Prior to August 28th, 1949, both the Con and Giant mines were stack-discharging their daily tonnage of arsenic to the general atmosphere. After that date Con mine undertook to experiment on a full-time basis with an impinger method of stack collection. Arsenic containing effluent sludge produced by this impinger method substituted for air pollution, water pollution of Pud Lake and related drainage system (possibly Kam Lake).

Two human cases of arsenic poisoning are a matter of record. Eight cows have been poisoned and the cause of death established as arsenic poisoning, by autopsy and analysis of organs. The observations made in the area indicate that last spring and summer a large percentage of the dogs of the community showed full range signs and symptoms and many did not recover until well on in the summer. Two horses within the town limits were poisoned and poisoning of wild life was observed widely, squirrels, foxes, birds and other fauna being affected. This clinical evidence of widespread and severe contamination by arsenic has resulted from ore-roasting processes which had been in operation only from July, 1948, in the case of the Con and January, 1949, in the case of the Giant.

#### Analysis of Samples

It was only possible to obtain very few samples during the preliminary survey and the degree and extent of the hazards cannot be fully assessed from this incomplete analytical data.

- (1) Sample of water from Kam Lake, submitted by Mr. K.J. Christie on December 15th was found to contain 0.186 mgms. of arsenic per litre. This is  $2\frac{1}{2}$  times the safe arsenic content for potable water. (see footnote) Kam Lake is reported to be the secondary source of water supply for the townsite and the alleged water supply for the Bevan farm.



- (2) Melted snow submitted by Mr. K.J. Christie on December 15th and taken 1.6 miles north of Giant Yellowknife Mine, contains 0.140 mgms. of arsenic per cubic foot of snow.
- (3) Melted snow submitted by Mr. K.J. Christie on December 15th and taken 1 mile north of Giant Yellowknife Mine contains 0.300 mgms. of arsenic per cubic foot of snow.
- (4) Market garden cabbage analyzed according to the A.O.A.C. sampling procedure contains 0.674 parts of arsenic per million.
- (5) Market garden celery similarly analyzed contains 2.59 parts of arsenic per million. This is  $2\frac{1}{2}$  times the safe amount of arsenic (see footnote).

Footnote: The Food and Drug Laboratories employ limits of up to 0.075 mgms. per litre for potable water and 1 part per million for safe foods. *0.1 mgms/litre As<sub>2</sub>O<sub>3</sub>.  
(as elemental arsenic)  
1.4 ppm As<sub>2</sub>O<sub>3</sub>*

Recommendations:

1. Information presented to the N.W.T. Council on December 22nd and analytical results completed since that date stress the urgency for implementing the recommendations contained in the final two paragraphs of your letter to R.A. Gibson, Esq., Deputy Commissioner of N.W.T., dated December 14th. In these paragraphs you recommend that -
  - (a) the roaster operations be stopped forthwith and that they remain so until proper arsenic collection and disposal practices have been placed in operation;
  - (b) further surveys be carried out to determine the degree and extent of the hazard which at present exists and steps necessary to make the area safe in the future.
2. Local authorities at Yellowknife should be notified that Kam Lake as a water supply is considered polluted and dangerous.
3. Local authorities at Yellowknife should be notified that locally grown market garden vegetables be withheld from distribution pending the results of further analyses.

Recommendations 2 and 3 have developed as a result of sample analyses and both situations require further investigation. The N.W.T. Council have not as yet been informed in writing concerning the result of the market garden vegetables submitted for analysis.

*K.C. Charron*  
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