



THE CITY OF WINNIPEG  
WATERWORKS, WASTE, AND DISPOSAL DEPARTMENT

1500 PLESSIS ROAD • BOX 178 TRANSCONA P.O. WINNIPEG • MANITOBA • R2C 2Z9

IN REPLY PLEASE REFER TO

FAX: (204) 224-0032

September 13th, 1990

Mr. L. Strachan, P.Eng.  
Acting Director of  
Environmental Approvals  
Manitoba Environment  
Building 2 - 139 Tuxedo Ave.  
Winnipeg, Manitoba  
R3N 0H6

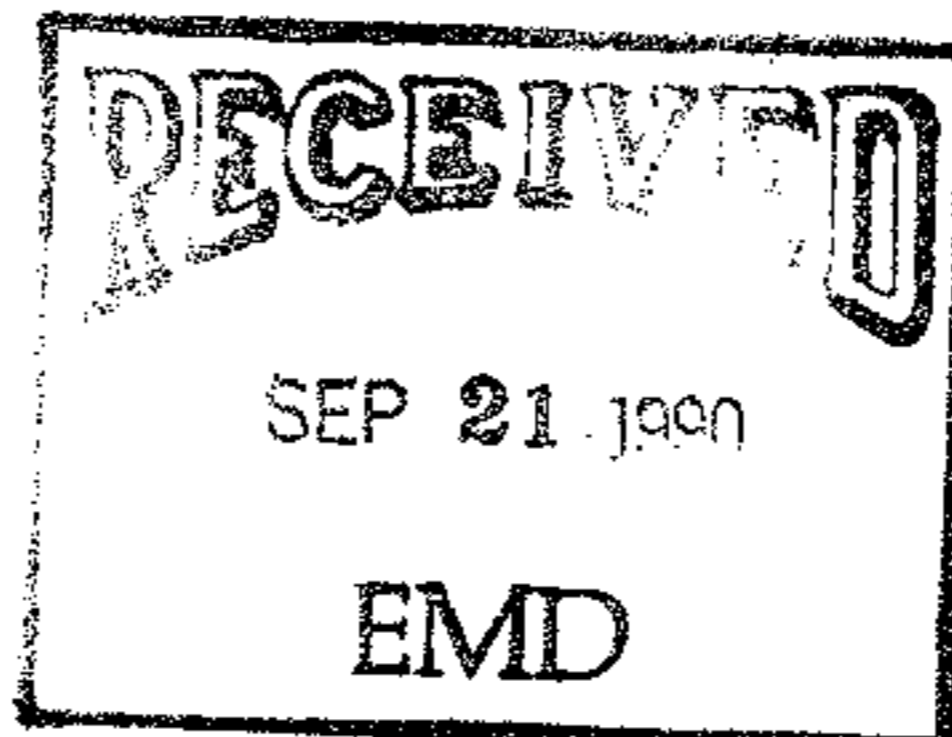
Dear Mr. Strachan:

**RE: PROPOSED PILOT PROGRAM FOR LEACHATE  
TREATMENT AT THE NEWPCC - OUR FILE NO. Z-1**

This letter is further to the registration package for the North End Water Pollution Control Centre (NEWPCC) submitted under the Environment Act on February 26, 1990.

As recently discussed with our Mr. K.J.T. Kjartanson, P.Eng., the Department has proposed to conduct a Pilot Leachate Recovery and Treatment Program as described in documentation submitted to Mr. C.B. Orcutt of Manitoba Environment. The proposal involves the treatment and disposal of recovered leachate at the NEWPCC. We would therefore request that the registration be amended to include the treatment of landfill leachate at the NEWPCC. It is anticipated that the pilot program will involve approximately 800,000 to 900,000 litres of leachate and information respecting the anticipated quality of the leachate is attached.

.....cont'd



WINNIPEG  
..where the New West begins.

As we are planning to conduct the pilot program during the fall of 1990, your prompt attention would be appreciated. If you have any questions or concerns respecting this matter, please contact Mr. Kjartanson at 986-4807.

Yours truly,



S.S. Yoshino, P.Eng.  
Director

KJTK/vb/gk  
attach.

c.c. E.H. Klassen, P.Eng.  
W.J. Borlase, P.Eng.  
A.H. Permut, P.Eng.  
B.D. MacBride, P.Eng.  
K.J.T. Kjartanson, P.Eng.

# BIOQUEST INTERNATIONAL Inc.

7 Loyola Bay  
Winnipeg, Manitoba  
Canada R3T 3J7

Phone : (204)-269-7264  
Fax : (204)-269-6897

Environmental Monitoring, Air Quality, and Bioassessment

August 1, 1989

Frank DeVries  
Chemist, Landfill Environmental Section  
City of Winnipeg  
Waterworks, Waste and Disposal Division  
1500 Plessis Road  
Box 178, Transcona P.O.  
Winnipeg, Manitoba  
R2C 2Z9

Dear Mr. DeVries:

Re: Purchase Order #273640

Upon receipt of the three containers of leachate on July 27, 1989, Bioquest performed two bioassays for toxicity on each sample. One test used the fathead minnow, the other test used the water flea, *Daphnia*. In summary, the LC<sub>50</sub> values obtained from these tests as follows:

Test	Brady	36L6	P8L
Fathead minnow ( <u>Pimphales</u> )	5%	> 10%	0.6%
<u>Daphnia magna</u>	0.3%	4%	0.1%

Neither test could be performed in undiluted test sample or in high concentrations of the samples due to the extreme turbidity of the samples. The most concentrated sample tested was a 10% dilution of each sample.

The details of the tests are described in the following pages.

(continued)

Fathead Minnow Test (*Pimphales promales*)

Fish obtained from private sources, held for a 10 day acclimation period in Bioquest facility prior to testing. Each test consisted of 10 fish, selected for length of 2", in each of 7 gallon glass aquaria at 10%, 5%, 2.5%, 1.2% and 0.1% concentrations of tested leachate. Dilution was performed using Bioquest internal standard water, and a control of 10 fish in standard water was performed for each test. The water was not oxygenated, to avoid detoxification of the sample by oxidation. The test period was 96 hours during which the fish were regularly monitored for distress or behavioural difficulties. No anomalous behaviour or respiratory problems were observed during the tests.

Table 1. Surviving fathead minnows (*Pimphales promales*) after 96 hour exposure to diluted leachate. Initial population for each test was 10 fish.

Sample	Survivors					CONTROL
	0.1%	1.2%	2.5%	5.0%	10.0%	
36L6	10	9	10	10	10	10
Brady	10	10	6	5	0	10
P8L	10	0	0	0	0	10

*Daphnia magna* Test

Each test consisted of 10 newborn *Daphnia magna* (Bioquest stock) in each of 100 mL of 10%, 5%, 1%, 0.5% and 0.1% concentrations of tested water. Dilution was performed using Bioquest internal standard water, and a control in standard water was performed for each test. The test period was 48 hours after which the number of survivors was counted.

(continued)

Table 2. Surviving *Daphnia magna* after 48 hour exposure to diluted leachate. Initial population for each test was 10 animals.

Sample	SURVIVORS					
	0.1	0.5%	1.0%	5.0%	10.0%	CONTROL
36L6	10	10	10	6	0	10
Bradley	10	3	0	0	0	10
P8L	5	0	0	0	0	10

In summary, sample P8L was the most toxic sample, while sample 36L6 was the least toxic sample. The results indicate that all three leachates are potentially toxic, although the material causing these effects cannot be determined by bioassays. These results, by themselves, do not suggest methods for treatment.

If you have further questions please contact me at 269-7264.

Sincerely,



Martin Samoiloff, Ph.D.  
Senior Scientist

TEST PARAMETER	SAMPLE LOCATION		
	St. Boniface Landfill Site 3-P8L 26 July 89	Brady Road Landfill Site 25-Leachate 27 July 89 Collector	Kil-Cona Park Landfill Site 36-P-L6 26 July 89
pH (units)	7.0	6.1	7.1
Total Solids (mg/L)	3400	14500	5300
Total Dissolved Solids (mg/L)	3200	12100	5400
Total Suspended Solids (mg/L)	600	2700	250
Specific Conductance (umho)	5500	9600	8500
Total Alkalinity (mg/L)	2450	2500	3000
Total Organic Carbon (mg/L)	870	8760	1460
Soluble Organic Carbon (mg/L)	600	4480	680
Volatile Fatty Acids (mg/L)	347	3635	24.2
Total Phosphorus (mg/L)	3.8	2.1	2.2
Total Kjeldahl Nitrogen (mg/L)	288	225	285
Ammonia Nitrogen (mg/L)	275	180	255
Nitrate-Nitrite Nitrogen (mg/L)	<0.04	<0.04	<0.04
Sulfate (mg/L)	200	800	200
Chloride (mg/L)	420	980	1200

TEST PARAMETER	St. Boniface Landfill Site 3-P8L 26 July 89.	Brady Road Landfill Site 25-Leachate 27 July 89 Collector	Kil-Cona Park Landfill Site 36-P-L6 26 July 89
Cyanide (free) (mg/L)	<0.01	<0.01	<0.01
Arsenic (total) (mg/L)	0.05	0.13	0.11
Mercury (ext) (mg/L)	0.8	0.3	0.15
<i>mg</i> Mercury (total) (mg/L)	1.0	2.3	9.7
Cadmium (total) (mg/L)	<0.01	0.01	<0.01
Lead (total) (mg/L)	<0.10	<0.10	<0.10
Zinc (total) (mg/L)	0.40	53.8	<0.05
Nickle (total) (mg/L)	0.12	0.45	0.12
Copper (total) (mg/L)	0.22	0.08	0.05
Chromium (total) (mg/L)	<0.05	0.85	<0.05
Iron (total) (mg/L)	30.6	88.5	11.7
Manganese (total) (mg/L)	0.35	7.8	0.10
Volatile Orgnaics (SVID)	Trace-Varsol Toluene O-xylene	Trace-Gasoline	Trace-Varsol type distillate
PCB (mg/L)	<10	<10	<10

TEST PARAMETER	SAMPLE LOCATION		
St. Boniface Landfill Site 3-P8L 26 July 89	Brady road Landfill Site 25-Leachate 27 July 89 Collector	Kil-Cona Park Landfill Site 36-P-L6 26 July 89	
2,4 - D (mg/L)	<1.0	0.13	<1.0
Dicamba (mg/L)	<1.0	0.02	<1.0
MCPA (mg/L)	<1.0	0.30	<1.0
Organochlorine Pesticides (mg/L)	<10	<10	<10
Organophosphorus Pesticides (mg/L)	<10	<10	<10
Organonitrogen Pesticides (mg/L)	<10	<10	<10
N-Methyl Carbamates (mg/L)	<10	<10	<10
Phenoxy-Acid Herbicides (mg/L)	<1	<1	<1





1071.02

October 5, 1990

Mr. S.S. Yoshino, P.Eng.  
The City of Winnipeg  
Waterworks, Waste and Disposal Department  
1500 Plessis Road  
Box 178 Transcona P.O.  
WINNIPEG, MANITOBA  
R2C 2Z9

Dear Mr. Yoshino:

**RE: Proposed Pilot Program For Leachate Treatment at the NEWPCC**

In response to your September 13, 1990 letter respecting the above noted subject matter, please be advised that the proposed pilot program is considered to be a minor alteration pursuant to Section 14(2) of The Environment Act and approval is hereby granted to implement the proposed pilot program.

I would appreciate being kept informed as to the progress and results of your proposed program.

Yours truly,

Original Signed by

Larry Strachan, P.Eng.  
Acting Director  
Environmental Approvals

LS/km