

Evaluation of the Potential Toxicity  
of Automobile Tires  
in the Aquatic Environment

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August 13, 1992

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## SUMMARY

A laboratory study was conducted to determine whether automobile tires leach contaminants that may be toxic to fish and *Daphnia*. Three tire types were examined including breakwater tires (used tires removed from an existing floating tire breakwater), scrap tires (used tires from the same vehicle) and new tires (never used on the road). Tires were individually exposed (one tire per tank) in glass aquaria containing 300 L of clean water for periods of 5, 10, 20 or 40 days. Samples of the overlying water (leachate) were removed at the end of the exposure period and tested for their toxicity to rainbow trout (*Oncorhynchus mykiss*) and *Daphnia magna* in accordance with standardized conditions of the static, acute lethality bioassay. Fathead minnows (*Pimephales promelas*) were included in the tests performed on leachates collected from the 20 and 40 day tire exposures only.

Testing showed that new and used tires released materials that were toxic to rainbow trout. Contaminants leached from these tires into the overlying water reached toxic concentrations within as little as 5 days. However, extended exposures lasting for periods of up to 40 days did not result in any further increases in leachate toxicity. Comparison of 96 hr LC50 values for the different tire types indicated that leachates from scrap tires (LC50 range 11.8% - 19.3%) were more toxic (lower LC50) to trout than leachates from new tires (LC50 range 52.1% - 80.4%). Leachate toxicity remained relatively stable over time, even after removal of the tires from the tanks, indicating that toxicity was not related to the presence of volatile materials. Leachate from tanks containing new tires was still toxic to trout when tested 8 days later, while leachate from scrap tires was still toxic to trout 32 days later. In contrast leachates from scrap tires and new tires showed no toxicity to *Daphnia magna* (48 hr exposure) or to fathead minnows (96 hr exposure). Leachates generated from breakwater tires (including all four extraction periods), were not acutely lethal to any species tested.

Results of the present study show that the substance(s) contributing to toxicity are water soluble and persistent. Further testing involving chemical characterization of the tire leachates is being carried out at the National Water Research Institute (NWRI) in Burlington, Ontario in an attempt to identify the specific factors contributing to toxicity.

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### **1.0 INTRODUCTION**

The rubber association of Canada reports that about 26 million tires are discarded annually; an estimated 60 million used tires are stored at hundreds of sites across Canada. Many tires are exposed to the aquatic environment in landfill and dump sites, and as road fill, fenders, artificial reefs and floating tire breakwaters. Although rubber products are thought to be relatively benign in the environment, questions have been raised recently as to whether certain rubber products leach contaminants that may adversely affect the aquatic environment. Results of several studies suggest that leaching of contaminants from tires in freshwater (Zelibor 1990, Edil *et al.* 1990, Tire Salvage Inc.) or in salt water (Stone *et al.* 1975) does not constitute a threat. However, results from Kellough (1991), the Minnesota Pollution Control Agency and a study done for the Souris Basin Development Authority (SBDA) are cause for concern due to the suggestion of toxicity to species of fish and invertebrates.

Reasons for the conflicting findings reported above may be related to the conditions under which the tires were exposed. In the study by Stone *et al.* (1975), fish were exposed together with tires in 2,000 L glass aquaria for periods lasting 21 days or longer. The tests were conducted under flow through conditions which involved the addition of fresh salt water at the rate of 15 L min<sup>-1</sup> (or approximately 11 tank volumes per day). Under these conditions, the authors were unable to show any adverse effects of tires on survival of pinfish *Lagodon rhomboides* and black sea bass *Centropristes striata*. On the other hand, Kellough (1991) exposed whole tires and cut tires in tanks containing a fixed volume of water (300 L) for periods of 30 and 60 days. Testing of the overlying water caused complete mortality of rainbow trout, but had no effect on survival of *Daphnia magna*. Goude and Barton (1992) exposed tire pieces under static renewal conditions which involved daily replacement of the overlying water. Under these conditions, tires were shown to release materials that were acutely toxic to rainbow trout, *D. magna*, *Ceriodaphnia* and bioluminescent bacteria. None of the studies published to date have been able to identify the specific contaminants contributing to toxicity or the source of the contaminants (i.e. whether they are present in the rubber to begin with or occur as a result of use or after being discarded).

On the recommendation of a multidisciplinary group of scientists that met at the National Water Research Institute (NWRI) in Burlington, Ontario, further testing was proposed to better define the leaching potential of tires in the aquatic environment. B.A.R. Environmental Inc. was contracted to conduct a comprehensive series of toxicity tests with the following objectives in mind: 1) to assess the leaching potential of a) new tires, having never been used on the road, b) scrap tires with known history of use and c) breakwater tires from a floating tire breakwater and 2) to compare the toxicity of tire leachate to aquatic biota including fish and *Daphnia*. Where leachates were identified as being acutely lethal to any test species, additional tests of an exploratory nature were conducted to obtain information about the nature of the contaminants contributing to toxicity. This included

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conducting tests on aged leachate samples to determine whether toxicity was related to the presence of volatile compounds. Where leachates were identified as having no toxic effects, leachate samples were concentrated through time and re-tested.

Leachates from the various tires were assessed for their toxicity to fish and *Daphnia* in accordance with standardized conditions of the static, acute lethality tests developed by Environment Canada. By definition, acute toxic effects are those which occur within a relatively short period of time (conventionally within four days). These effects may be lethal or sublethal. For the purpose of this report, we will refer to acute lethal toxicity.

### **2.0 METHODS AND MATERIALS**

#### **2.1 TEST PROTOCOL**

Laboratory tests were carried out to determine the toxicity of leachate from new and used automobile tires to fish and *Daphnia* and the effect of exposure time on leachate toxicity. Three tire types were evaluated in this study. These included breakwater tires (used tires that have been immersed in water for an extended period of time), scrap tires (used tires removed from a single vehicle) and new tires (never used on the road). Four tires of each tire type were obtained for testing. Tires within each group (excluding breakwater tires) were similar with respect to the manufacturer, make, size and history of use.

To test the effects of different exposure time on leachate toxicity, tires were immersed in water for 5 days (series A), 10 days (series B), 20 days (series C) and 40 days (series D). Each series of tests consisted of testing leachate from the three tire types (new, scrap, breakwater tires) plus a dilution water control. At the end of each exposure period, 40 L of the overlying water was removed for testing. Tires used in the 5 day exposure were left in the tanks for further testing of concentrates (see below). Tires from all other tanks were removed at the end of the exposure period.

An additional series of tests were conducted on leachate samples that were allowed to concentrate to maximize their potential toxicity. Tire exposures (series A) were extended for up to 35 days beyond the initial 5 day exposure period. Samples of the overlying water (40 L) were removed for testing at 5 day intervals over the first 15 days post exposure and a final sample was taken at 35 days post exposure (40 d total exposure).

A final series of tests were conducted to determine whether toxicity was related to the presence of volatile materials. Upon termination of the 10 day tire exposure (series B), tires were removed from the tanks. Samples of the overlying water were removed for testing after 1, 2, 4, 8, 16 and 32 days.

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### **2.2 SOURCE OF TIRES**

#### **2.2.1 Breakwater Tires**

Breakwater tires were obtained from the LaSalle Park floating tire breakwater situated in Hamilton Harbour (Bishop 1985). The tire breakwater was installed in April 1981 and the tires used for testing were removed in the fall of 1991. The breakwater tires varied with respect to the manufacturer, make and/or size, but all tires received the same amount of exposure in lake water prior to testing (i.e.  $\approx$ 10 years). A description of the individual tires used in the study is provided in Table 1.

#### **2.2.2 Scrap Tires**

The scrap tires were removed from a single vehicle (1988 Buick Skylark). All tires were similar with respect to make (Uniroyal) age (4 years), amount of wear (32,000 km each) and specifications (P205/70R13, blackwall).

#### **2.2.3 New Tires**

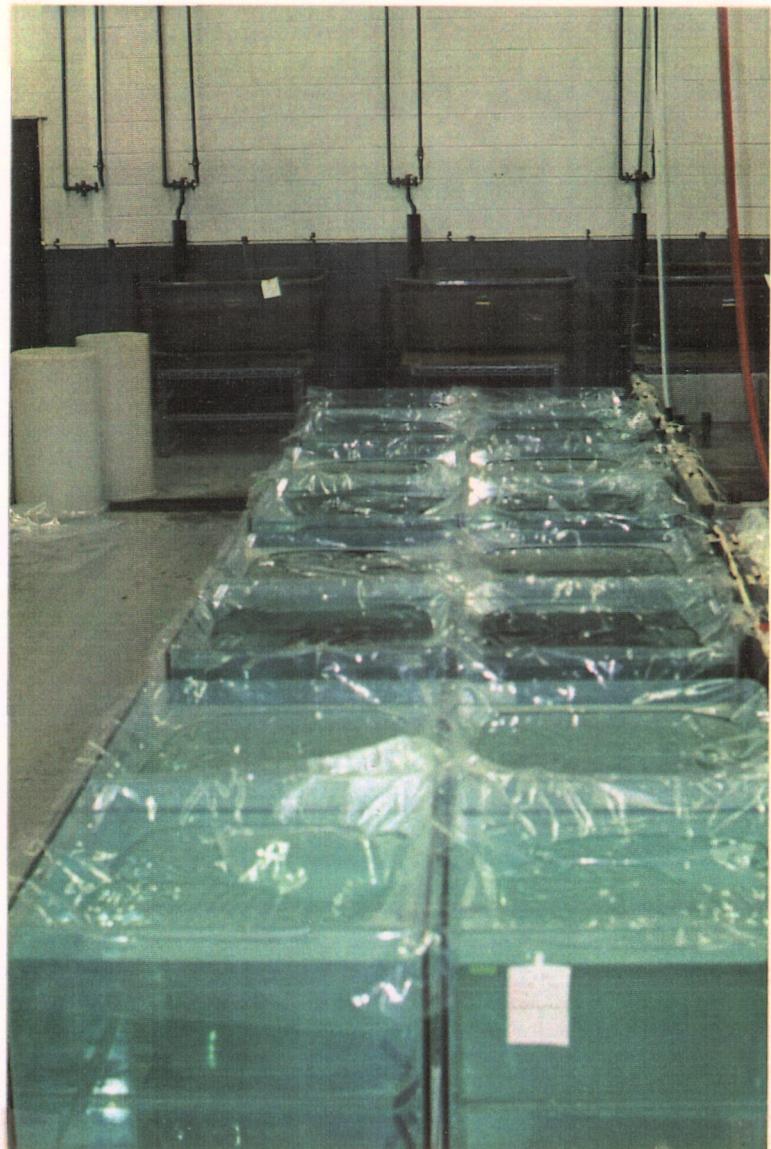
We attempted to obtain new tires that were similar to the scrap tires with respect to make and size (i.e. Uniroyal P205/70R13, blackwall), although new tires matching these specifications were not available in blackwall. Therefore, slightly smaller tires (Uniroyal P195 70R14) were substituted.

### **2.3 PREPARATION OF TIRE LEACHATES**

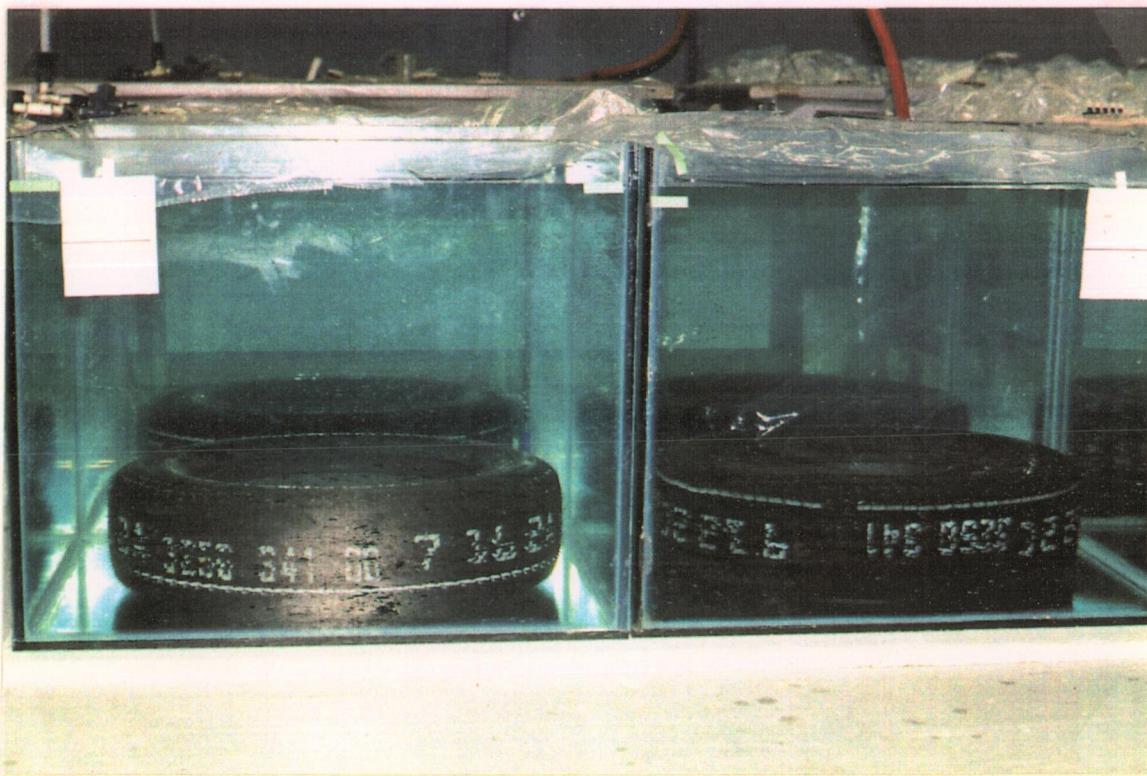
Only whole tires were used in the preparation of the tire leachates for testing purposes. Prior to placement in tanks, tires were washed with detergent (Sparkleen<sup>TM</sup>, 100ppm pH 9.8) and rinsed well in dilution water. Tires were individually placed into each of 12 clean, glass aquaria containing 300 L of laboratory dilution water (Figure 1a, b). An additional 4 aquaria were set up as controls which contained dilution water only (one for each of the four exposure periods).

The ratio of tire to water ranged from approximately 27 to 42 g/L depending on the type of tire. The overlying water was aerated for the full period of exposure using oil-free compressed air. Each tank was covered with a sheet of food-grade (polyethylene) plastic to reduce the amount of water lost through evaporation and to prevent contamination of the overlying water.

Figure 1. Tire Exposure System.  
a) Overview of exposure tanks  
b) front view of  
exposure tanks containing  
new tires.



b)



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**Table 1. Description and specifications of automobile tires used in the study.**

Tire Series	Make-Model	Size	Approximate Weight (in kg)	Type <sup>1</sup>	Tread Construction	Tread Depth (in)	Condition
<b>Breakwater tires</b>							
A	B.F. Goodrich Lifesaver 78	FR78-15	11.5	W	2 plies polyester & 2 plies steel	7/32	Cord exposed under whitewall and around rim
B	Uniroyal-Fleetmaster	8.00-16.5LT	12.5	B	8 ply rating	<3/32	Extensive wear, main treads gone
C	Goodyear	GR78-15	10.1	B	4 plies (2 polyester cord & 2 fibre glass cord)	<3/32	Extensive wear
D	B.F. Goodrich Lifesaver 78	GR78-15	10.3	W	2 plies polyester & 2 plies steel	5/32	Extensive wear, small section of white rubber exposed on sidewall
<b>Scrap Tires</b>							
A	Uniroyal Rally HP	P205/70R3 M&S	9.2	B	3 ply	5/16	32,000 km, very little wear
B	Uniroyal Rally HP	P205/70R3 M&S	9.2	B	3 ply	9/32	32,000 km, very little wear
C	Uniroyal Rally HP	P205/70R3 M&S	9.2	B	3 ply	9/32	32,000 km, very little wear
D	Uniroyal Rally HP	P205/70R3 M&S	9.2	B	3 ply	5/16	32,000 km, very little wear
<b>New Tires</b>							
A-D	Uniroyal Tiger Paw XTM	P185/70R14	8.0	B	5 ply	5/16	New, 0 km.

<sup>1</sup> Type B = Blackwall, W = Whitewall

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### 2.4 DILUTION WATER

Natural groundwater was used as the source of water for holding and testing purposes and for leaching the tires. This water was filtered through a 20 micron cellulose-acetate filter and sterilized using ultra violet radiation. A continuous supply of oil-free compressed air was provided to bring the pH and concentration of dissolved oxygen and other gases into equilibrium with air. The concentration of dissolved oxygen in the dilution water was maintained at >70% of the air saturation value at all times.

Bioassays with fish were conducted in undiluted groundwater (hardness = 260 mg/L as CaCO<sub>3</sub>). Bioassays with *Daphnia* were conducted in ground water diluted with reverse osmosis (R.O.) water to obtain a total hardness level of approximately 160 mg/L as CaCO<sub>3</sub>. The chemical characteristics of the dilution waters are provided in Appendix 1.

### 2.5 TEST ORGANISMS

Rainbow trout (<1 gm) were obtained from a licensed fish hatchery in Ontario (Rainbow Springs Trout Farm, Thamesford, Ontario). The fish were certified disease-free as described in Schedule B of the Fish Health Protection Regulation under the Fisheries Act of Canada. Prior to testing, fish were held in square plastic tanks provided with a continuous supply of well aerated water at 15 ± 1°C and fed commercial trout chow at a rate of 4% of their body weight per day.

Fathead minnows and *Daphnia magna* were obtained from in-house cultures. The initial brood stock was obtained from the Aquatic Biology Unit, Ministry of the Environment, Rexdale, Ontario. Minnows were cultured in water maintained at 25 ± 1°C. Fish were fed a diet of brine shrimp nauplii only during early development, then frozen adults up until the time of testing. Tests were conducted using 3 to 4 month old fish weighing <0.5 gm. *Daphnia* were cultured in water maintained at 20 ± 1°C. Organisms were fed a suspension of unicellular algae (*Selenastrum capricornutum* and *Chlorella fusca*) as well as a mixture of yeast, trout chow and Cerophyll (YCT). *Daphnia* cultures were culled at regular intervals to maintain log phase growth and prevent production of ephippia (fertilized eggs). Gravid adults were separated from the culture stock and individually placed in 250 mL glass beakers filled with culture water. Organisms for testing were separated from the actively reproducing cultures. Only first-instar Daphnids (<24 hr old) were used in tests.

The lighting and photoperiod maintained for holding and testing purposes was similar for all species tested. This consisted of fluorescent lighting (40 to 50 foot-candles) which was provided on a controlled daily lighting regime of 16 hours light and 8 hours dark.

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### **2.6 BIOASSAYS WITH FISH AND *DAPHNIA***

Leachates were assessed for their acute toxicity to fish and *Daphnia* according to standardized conditions of the static, acute lethality test using the procedures developed by Environment Canada. These included the 48 hour acute lethality test using *Daphnia magna* (EPS 1/RM/13 1991) and the 96 hour acute lethality test using rainbow trout (EPS 1/RM/14 1991). Additional tests with fathead minnows were conducted on leachates collected from the 20 day and 40 day exposures, series C and D, respectively. Bioassays with minnows consisted of exposure to the undiluted leachate (100%), plus a dilution water control.

Bioassays with trout were conducted in plastic exposure chambers, fitted with a food-grade polyethylene liner, containing 20 L of test solution (Figure 2a). Testing temperatures and photoperiod were similar to those of culture or holding conditions and kept constant between all tests. The tests were conducted in temperature controlled water baths held at  $15 \pm 1^\circ\text{C}$ . Feeding of the test fish was terminated 24 hours prior to the start of the test. Solutions were gently aerated (oil-free compressed air) throughout the 96 hour exposure period. All tests were conducted under static conditions with no renewal of the test solution. Observations for immobility or mortality were made and recorded after 4, 24, 48, 72 and 96 hours (final observation). A fish was considered dead if there was no evidence of opercular or other activity and no response to gentle prodding.

Bioassays with fathead minnows were conducted in clean, glass aquaria containing 18 L of test solution. Test conditions were similar to those used in tests with trout except that the experiments were carried out at  $20 \pm 1^\circ\text{C}$ .

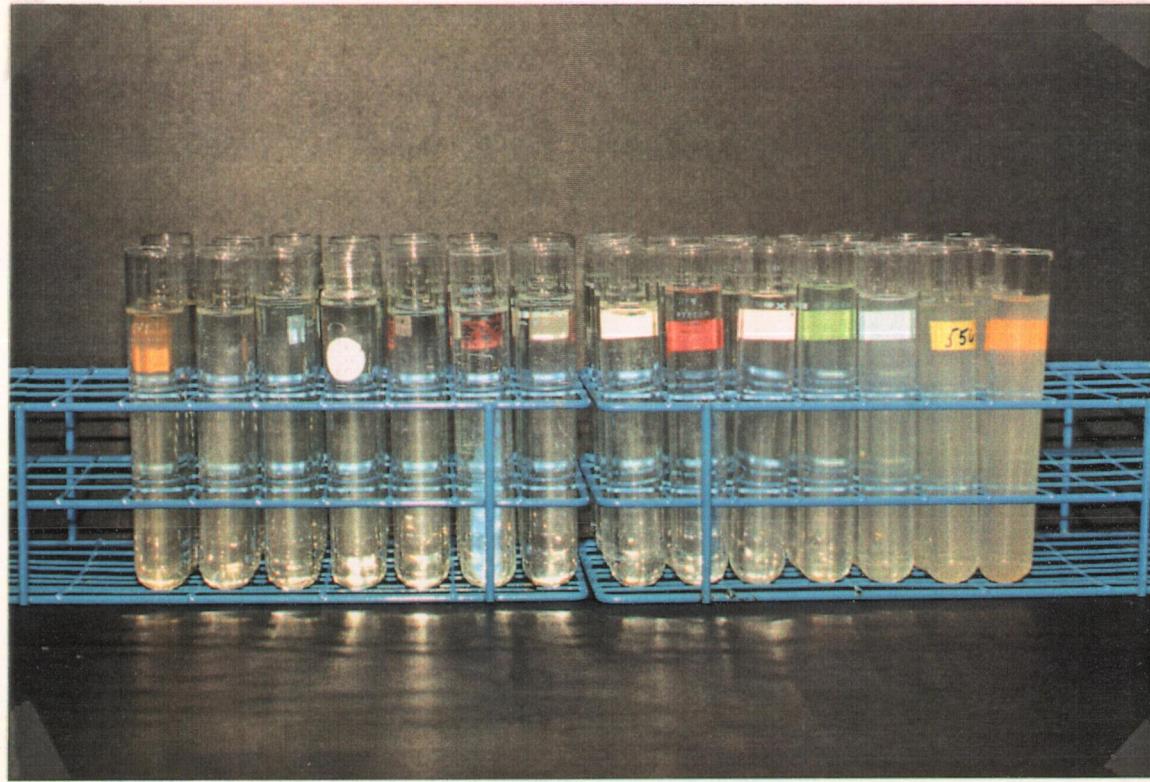
Bioassays with *Daphnia* were conducted at  $20 \pm 1^\circ\text{C}$  in clean glass test tubes (25 X 150 mm) containing 50 mL of solution (Figure 2b). All tests were initiated using first-instar neonates (<24 hr old). Three neonates were randomly placed into each of four replicate test chambers for a total of twelve animals per concentration. Each test included at least one group of control organisms in 100% laboratory dilution water, but otherwise exposed to the same conditions as the test specimens. Testing temperature and photoperiod were similar to those during the holding period prior to testing and kept constant during all tests. Test solutions were not aerated during the 48 hour exposure period.

Each LC50 test consisted of a minimum of five concentrations including 6, 12, 25, 50 and 100% (full strength) plus a dilution water (groundwater) control. A minimum of ten animals were exposed to each test and control solution. Observations for immobility or mortality were made and recorded after 24, and 48 hours (final observation). A Daphnid was considered to be dead if there was no visible heart beat upon microscopic examination. Records were made of all other signs of stress during, and at completion of the bioassay.



Figure 2a. Rainbow trout test system.

Figure 2b. *Daphnia magna* test system



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Measurements of conductivity, pH and dissolved oxygen levels in each test solution including the control were made at the beginning and at the end of the test. Water temperature was measured and recorded at each observation period. A test was considered to be invalid if more than ten percent (>1 out of ten animals) of the control animals exhibited atypical/stressed behaviour and/or mortality.

Samples of the overlying water from the series C and D exposures were collected at Environment Canada's request and submitted to NWRI for analysis of organic contaminants as well as for heavy metals. Samples were collected and preserved according to procedures recommended by Environment Canada's National Water Quality Laboratory.

### **2.7 DATA ANALYSIS**

Median lethal (LC50) concentrations and their 95% Confidence Intervals were calculated using survival data at the end of the test and nominal test concentrations by the probit analysis method (Stephan 1977). The LC50 concentration is defined as the concentration of material (in this case leachate) in water that is lethal to 50% of the test organisms after a defined period of exposure (eg. 96 hr for trout). LC50s were expressed as a percentage of the full strength leachate. For example, if the trout LC50 for a leachate was estimated to be 10%, this would indicate that when diluted to 1/10th full strength (ie. 10% leachate, 90% dilution water), the leachate would be expected to kill 50% of the test fish in a 96 hr period. The raw data including mortality found in each of the test solutions and the test conditions (eg. dissolved oxygen, pH, temperature and conductivity) for all tests is included in Appendices 2 - 4.

## **3.0 RESULTS**

### **3.1 BREAKWATER TIRES**

Leachates generated from breakwater tires (all exposures), showed no toxicity to rainbow trout, fathead minnows or *Daphnia magna* (Table 2). Furthermore, no appreciable changes in toxicity to fish or *Daphnia* were observed when the leachates were allowed to concentrate through time (Table 3).

### **3.2 SCRAP TIRES**

Scrap tires leached for as little as 5 days, released materials that were acutely toxic to rainbow trout (Table 2). LC50 values estimated for leachates generated from each of the four extraction periods (i.e. 5, 10, 20, and 40 days) were similar, ranging from 11.8% to 19.3%. Further testing of the toxic leachate from tanks with tires removed, demonstrated that toxicity was relatively stable over time, suggesting that toxicity was not related to the presence of volatile materials (Table 4). LC50s were similar (16.0% to 25.0%) over the first 8 days and remained unchanged from the initial exposure (LC50 15.1%). By 16 days, the LC50 value had increased marginally to 40.5%, and no further decrease in toxicity was noted by 32 d (LC50 = 35.4%).

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Table 2.

Toxicity of automobile tire leachates to rainbow trout, fathead minnows and Daphnia magna. Table values include the LC50 and 95% confidence limits (in parentheses).

Species	Exposure Series	Extraction Period (d)	Tire Type			
			Control	Breakwater	Scrap	New
Rainbow trout (0.5 - 1.0g)	A	5	Non lethal	Non lethal	19.3 (13.0 - 25.0)	75.1 (50.0 - 100.0)
	B	10	Non lethal	Non lethal	15.1 (6.0 - 25.0)	54.6 (25.0 - 100.0)
	C	20	Non lethal	Non lethal	16.8 (13.0 - 25.0)	52.1 (38.8 - 70.6)
	D	40	Non lethal	Non lethal	11.8 (6.0 - 25.0)	80.4 
Fathead minnow (3-4 mo old)	A	5	-	-	-	-
	B	10	-	-	-	-
	C	20	Non lethal	Non lethal	Non lethal	Non lethal
	D	40	Non lethal	Non lethal	Non lethal	Non lethal
<u>Daphnia magna</u> (<24 hr old)	A	5	Non lethal	Non lethal	Non lethal	Non lethal
	B	10	Non lethal	Non lethal	Non lethal	Non lethal
	C	20	Non lethal	Non lethal	Non lethal	Non lethal
	D	40	Non lethal	Non lethal	Non lethal	Non lethal

Non lethal means no mortality.

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Table 3.

Toxicity of concentrated tire leachates (Series A) to rainbow trout, and Daphnia magna. Table values include the LC50 and 95% confidence limits (in parentheses).

Species	Tire Concentrate (Series A)	Tire Type			
		Control	Breakwater	Scrap	New
Rainbow trout	Initial exposure (day 0)	Non lethal	Non lethal	19.3 (13.0 - 25.0)	75.1 (50.0 - 100.0)
	5 d post exposure	Non lethal	Non lethal	16.0 (6.0 - 25.0)	61.8 (46.5 - 82.8)
	10 d post exposure	Non lethal	Non lethal	-	-
	15 d post exposure	Non lethal	Non lethal	-	-
	35 d post exposure	Non lethal	Non lethal	-	-
<u>Daphnia magna</u>	Initial exposure (day 0)	Non lethal	Non lethal	Non lethal	Non lethal
	5 d post exposure	Non lethal	Non lethal	Non lethal	Non lethal
	10 d post exposure	Non lethal	Non lethal	Non lethal	Non lethal
	15 d post exposure	Non lethal	Non lethal	Non lethal	Non lethal
	35 d post exposure	Non lethal	Non lethal	Non lethal	Non lethal

Non lethal means no mortality.

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**Table 4.** Effect of storage time on toxicity of tire leachate to rainbow trout. Table values include the 96 hr LC50 and 95% confidence limits (in parentheses).

Storage time in days after tires removed	Tire Type			
	CONTROL	BREAKWATER TIRE	SCRAP TIRE	NEW TIRE
0	Non lethal	Non lethal	15.1 (6.0 - 25.0)	54.6 (25.0 - 100.0)
1	Non lethal	-	16.0 (13.0 - 25.0)	54.6 (25.0 - 100.0)
2	Non lethal	-	16.8 (13.0 - 25.0)	62.2 (25.0 - 100.0)
4	Non lethal	-	18.0 (13.0 - 25.0)	84.7 
8	Non lethal	-	25.0 (13.0 - 50.0)	65.7 (50.0 - 100.0)
16	Non lethal	-	40.5 (30.7 - 53.7)	Non lethal
32	Non lethal	-	35.4 (25.0 - 50.0)	Non lethal

Non lethal means < 10% mortality.

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In contrast to the results of tests conducted with trout, survival of *Daphnia* was not affected by exposure to leachates from any of the tires tested suggesting that contaminant(s) levels were below acute toxic threshold concentrations for this species. Similarly, leachates from the 20 day and 40 day tire exposures (series C and D), had no adverse effects of survival of fathead minnows. Tests conducted on the concentrated leachate samples collected from series A tire exposures (Table 3), did not alter the results of the initial tests conducted with *Daphnia* (ie. non toxic to *Daphnia*).

### 3.3 NEW TIRES

Leachate generated from new tires was also found to be acutely toxic to rainbow trout (Table 2). LC50 values estimated for new tire leachates were similar for each extraction period (52.1% to 80.4%), but were consistently higher (indicating lower toxicity) than LC50s estimated for leachates from scrap tires (11.8% - 19.3%). As observed in tests with scrap tires, continued testing of the leachate from tanks with tires removed, demonstrated that toxicity was relatively unchanged at least over the first 8 days (Table 4). LC50 values ranged from 54.6% to 84.7% and were similar to that determined for the initial test (LC50 = 54.6%). Leachate toxicity decreased after 8 days and was eliminated by 16 days.

Survival of *Daphnia* was not affected by exposure to leachate materials from any of the tires tested indicating that contaminant(s) levels were below acute toxic threshold concentrations for this species. Similarly, exposure to leachate from the 20 day and 40 day tire exposures (series C and D), had no adverse effects of survival of fathead minnows.

Tests conducted on the concentrated leachate samples collected from series A tire exposures (Table 4), did not alter the results of the initial tests conducted with *Daphnia* (ie. non toxic to *Daphnia*).

### 4.0 DISCUSSION

Our results clearly show that scrap tires leach materials that are acutely toxic to rainbow trout, but not to fathead minnows or *Daphnia magna*. This is in accord with previous laboratory findings of Kellough (1991), who observed that leachate from scrap tires caused complete mortality of trout, but had no effect on survival of *Daphnia*. Toxicity tests in both studies were carried out by B.A.R Environmental and so the close agreement between these studies is not surprising. In contrast, tests conducted by Goudey and Barton (1992), showed that leachate from tire pieces were toxic to rainbow trout, but also to *D. magna* and *Ceriodaphnia*. Their findings with respect to *D. magna*, are counter to those of the present study, but may be related to differences in sensitivity of the laboratory culture stocks or to differences in experimental conditions. Either the duration of tire exposure or the ratio of tire material to water could affect the concentration of contaminants in the overlying water and hence alter the response of the test organisms. The ratio of tire material to water used

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by Goudey and Barton (1992) was approximately 5 times higher than that used in the present study. However, the duration of the tire exposure in their study was shorter (24 hr) when compared to the present study (5 - 40 days).

The results of the present study and those of others shows that the toxicity of the substances leached from tires varies according to species. While rainbow trout were found to be extremely sensitive, fathead minnows and *Daphnia* were unaffected. In our study, toxic concentrations of the offending material(s) in the overlying water were achieved within a relatively short period of time ( $\leq 5$  days). Furthermore, extended exposures lasting from 10 to 40 days did not result in any additional increase in toxicity. Although the experimental designs were different, Goudey and Barton (1992) observed that the leachable substance(s) reached acutely toxic concentrations in as little as 24 hours. These results are suggestive that the contaminant(s) quickly reach some equilibrium level (within as little as 24 hr). In the present study, this equilibrium concentration exceeded the toxic threshold level for rainbow trout, but appeared to be below threshold levels for fathead minnows and *D. magna*.

Previous studies have not included testing of new tires or used tires which have been exposed in water for an extended period of time. In the present study, new tires were found to be toxic to rainbow trout, but not to other species tested. These results suggest that toxicity is associated with materials that are present in or on the rubber as a result of the manufacturing process as opposed to being picked up at some later time while in use or after being discarded. Comparison of the respective LC50's indicated that scrap tires were more toxic than new tires. On the other hand, breakwater tires exhibited no toxicity to rainbow trout, fathead minnows or *Daphnia magna* suggesting that tires may stop leaching toxic materials after an extended period of exposure in water.

Our data support the conclusions from previous studies that toxic contaminant(s) leached from tires are water soluble and are non-volatile. The specific contaminants contributing to toxicity, however, have not as yet been identified. Kellough (1991) reported no detectable levels of PCBs/Organochlorine Pesticides in the overlying water. Similarly, PAHs were non-detectable with the exception of Antracene-d<sub>10</sub> and Chrysene-d<sub>12</sub>. However, the source of these contaminants could not be related to the tires, since these materials were also elevated in the control water. With the exception of zinc, no increase in the levels of heavy metals was detected. The increased levels of zinc noted at day 60 occurred in the control tank as well as the tanks containing tires and so could not be related to the presence of the tires. In the study by Goudey and Barton (1992), chemical characterization of the overlying water was not conducted.

Chemical characterization of the overlying water from the present study is being conducted at the National Water Research Institute in Burlington. Results of these tests may help to identify the offending contaminants.

## Environment Canada Tire Leachate Study

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## **APPENDICES**

### **Legend:**

Test Number 1 = Rainbow trout  
Test Number 2 = *Daphnia magna*  
Test Number 3 = Fathead minnow

**APPENDIX 1**

**Description of Laboratory Dilution Water**

**DESCRIPTION OF LABORATORY DILUTION WATER**

<b>Parameter (mg/l)</b>	<b>trout dilution water</b>	<b>daphnia dilution water</b>
pH (20°C)	7.70	8.50
pH (20°C) - treated	-	-
Conductivity ( $\mu\text{mho}$ )	428	252
TSS	<1	<1
Chromium (VI)	<0.01	<0.01
COD	<10	13
TOC - Beckmann	15	10
DOC - Beckmann	15	10
Total Cyanide	0.001	0.001
Free Cyanide	0.001	0.001
Ammonia (as N)	0.04	0.032
TKN (as N)	<0.2	<0.2
Hardness (as $\text{CaCO}_3$ )	281	161
Fluoride	<0.1	0.27
Chloride	1.6	0.76
Nitrite (as N)	<0.04	<0.04
Bromide	<0.8	<0.8
Nitrate (as N)	<0.04	<0.04
Phosphate (as P)	<0.8	<0.8
Sulfate	33	17
Alkalinity (as $\text{CaCO}_3$ )	265	150
Antimony	<0.005	<0.005
Arsenic	0.031	0.014
Mercury	<0.0001	<0.0001
Selenium	<0.005	<0.005
Calcium	63	35
Magnesium	30	18
Sodium	5.6	4
Potassium	1.6	0.95
Aluminum	0.10	0.071
Barium	0.10	0.056
Beryllium	<0.001	<0.001
Boron	0.28	0.21
Cadmium	<0.002	<0.002
Chromium	<0.004	<0.004
Cobalt	<0.01	<0.01
Copper	<0.006	<0.006
Iron	0.22	0.073
Lead	<0.02	<0.02
Manganese	0.011	0.007
Molybdenum	<0.02	<0.02
Nickel	<0.01	<0.01
Phosphorous	<0.06	<0.06
Silicon	9.0	5.4
Silver	<0.01	<0.01
Strontium	0.17	0.094
Sulfur	12	7.4
Thallium	<0.06	<0.06
Titanium	<0.01	<0.01
Vanadium	<0.005	<0.005
Zinc	0.007	0.015
Zirconium	<0.01	<0.01

## **APPENDIX 2**

### **Raw Data Reports for Tests on Raw Tire Leachates**

## **APPENDIX 2a**

**Series A (5 day exposure)**

- Rainbow trout
- *Daphnia magna*

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920005 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region : , ONT  
Control point : Control A 5 d exp\*, (100)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/17/92  
Received : 02/17/92  
Tested : 02/17/92  
Time : 1530  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.56  
Length(mm) : 41.30

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper              Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920085

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.4		8.5	
	O <sub>2</sub> ppm	9.5		9.5	
	Cond.	488		486	
	Temp(C)	15.0	15.0	15.0	15.0

100	pH	8.4		8.5	
	O <sub>2</sub> ppm	9.5		9.4	
	Cond.	489		483	
	Temp(C)	15.0	15.0	15.0	15.0

Control	pH	7.9		8.5	
	O <sub>2</sub> ppm	9.2		9.3	
	Cond.	518		514	
	Temp(C)	15.0	15.0	15.0	15.0

Control	pH	7.9		8.5	
	O <sub>2</sub> ppm	9.3		9.4	
	Cond.	518		514	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920086 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region : , ONT  
Control point : Reef Tire A\*, (200)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/17/92  
Received : 02/17/92  
Tested : 02/17/92  
Time : 1535  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.56  
Length(mm) : 41.30

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920086 Test Number: 1

TEST CONC. %		E L A P S E D T I M E				
		00:00	24:00	48:00	72:00	96:00

100	pH	8.4			8.5	
	O <sub>2</sub> ppm	9.5			9.7	
	Cond.	489			504	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.3			8.5	
	O <sub>2</sub> ppm	9.4			9.7	
	Cond.	505			513	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	8.3			8.5	
	O <sub>2</sub> ppm	9.4			9.4	
	Cond.	510			511	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
13	pH	8.2			8.4	
	O <sub>2</sub> ppm	9.3			9.1	
	Cond.	512			518	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
6	pH	8.0			8.4	
	O <sub>2</sub> ppm	9.3			9.2	
	Cond.	514			520	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.9			8.5	
	O <sub>2</sub> ppm	9.3			9.3	
	Cond.	515			513	
	Temp(C)	15.0	15.0	15.0	15.0	15.0

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY :

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920087 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , CNT

Control point : New Tire A\*, (300)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/17/92  
Received : 02/17/92  
Tested : 02/17/92  
Time : 1540

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fishn. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.56  
Length(mm) : 41.30

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	5	8	8	80
50	0	0	0	1	1	10
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

75.10000      100.00000      50.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920087

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.3	8.6	8.6	
	O2 ppm	9.8	9.6	9.9	
	Cond.	509	500	503	
	Temp(C)	15.0	15.0	15.0	15.0
50	pH	8.1		8.6	
	O2 ppm	9.7		9.8	
	Cond.	515		513	
	Temp(C)	15.0	15.0	15.0	15.0
25	pH	8.0		8.6	
	O2 ppm	9.6		9.7	
	Cond.	516		513	
	Temp(C)	15.0	15.0	15.0	15.0
13	pH	8.0		8.5	
	O2 ppm	9.6		9.6	
	Cond.	519		516	
	Temp(C)	15.0	15.0	15.0	15.0
6	pH	8.0		8.5	
	O2 ppm	9.5		9.6	
	Cond.	521		520	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	8.0		8.4	
	O2 ppm	9.5		9.2	
	Cond.	521		519	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : **B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920088 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : Scrap Tire A\*, (400)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/17/92  
Received : 02/17/92  
Tested : 02/17/92  
Time : 1545

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.56  
Length(mm) : 41.30

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	10	10	10	10		100
50	0	10	10	10	10		100
25	0	0	9	9	9		90
13	0	0	0	0	0		0
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

19.30000      25.00000      13.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920088

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4	8.5		
	O2 ppm	9.8	9.2		
	Cond.	500	499		
	Temp(C)	15.0	15.0		
50	pH	8.2	8.6		
	O2 ppm	9.7	9.6		
	Cond.	510	500		
	Temp(C)	15.0	15.0		
25	pH	8.1	8.5	8.5	
	O2 ppm	9.6	9.4	9.6	
	Cond.	514	509	513	
	Temp(C)	15.0	15.0	15.0	15.0
13	pH	8.1		8.5	
	O2 ppm	9.6		9.5	
	Cond.	516		516	
	Temp(C)	15.0	15.0	15.0	15.0
6	pH	8.0		8.5	
	O2 ppm	9.5		9.6	
	Cond.	515		518	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	8.0		8.5	
	O2 ppm	9.4		9.3	
	Cond.	517		512	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920085 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Control A - 5 d exp., (100)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/17/92  
Received : 02/17/92  
Tested : 02/17/92  
Time : 1405  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D → T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920085

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.4	8.4
	O2 ppm	9.4	9.1
	Cond.	487	472
	Temp(C)	19.0	20.0
		19.5	
100	pH	8.4	8.4
	O2 ppm	9.4	9.1
	Cond.	487	473
	Temp(C)	19.0	20.0
		19.5	
Control	pH	8.2	8.3
	O2 ppm	9.4	9.0
	Cond.	300	305
	Temp(C)	19.0	20.0
		19.5	
Control	pH	8.2	8.4
	O2 ppm	9.4	9.0
	Cond.	300	303
	Temp(C)	19.0	20.0
		19.5	

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920086 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Reef Tire A, (200)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/17/92  
Received : 02/17/92  
Tested : 02/17/92  
Time : 1415  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY %
	%	00:00	24:00	48:00
100	0	0	0	0
50	0	0	0	0
25	0	0	0	0
13	0	0	0	0
6	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper              Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920086

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.0	8.4
	O2 ppm	9.4	9.2
	Cond.	513	482
	Temp(C)	19.0 20.0	19.5
50	pH	8.4	8.5
	O2 ppm	9.4	9.2
	Cond.	402	400
	Temp(C)	19.0 20.0	19.5
25	pH	8.3	8.4
	O2 ppm	9.4	9.2
	Cond.	350	352
	Temp(C)	19.0 20.0	19.5
13	pH	8.2	8.4
	O2 ppm	9.4	9.1
	Cond.	327	329
	Temp(C)	19.0 20.0	19.5
6	pH	8.2	8.4
	O2 ppm	9.4	9.1
	Cond.	315	316
	Temp(C)	19.0 20.0	19.5
Control	pH	8.2	8.4
	O2 ppm	9.4	9.2
	Cond.	300	303
	Temp(C)	19.0 20.0	19.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920087 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : New Tire A, (300)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/17/92  
Received : 02/17/92  
Tested : 02/17/92  
Time : 1430  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
25	0	0	0	0
13	0	0	0	0
6	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920087

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.3	8.4	
	O <sub>2</sub> ppm	9.4	9.2	
	Cond.	503	486	
	Temp(C)	19.0	20.0	19.5
50	pH	8.3	8.5	
	O <sub>2</sub> ppm	9.3	9.2	
	Cond.	402	400	
	Temp(C)	19.0	20.0	19.5
25	pH	8.3	8.4	
	O <sub>2</sub> ppm	9.4	9.2	
	Cond.	352	352	
	Temp(C)	19.0	20.0	19.5
13	pH	8.3	8.4	
	O <sub>2</sub> ppm	9.3	9.2	
	Cond.	326	327	
	Temp(C)	19.0	20.0	19.5
6	pH	8.3	8.4	
	O <sub>2</sub> ppm	9.4	9.2	
	Cond.	313	313	
	Temp(C)	19.0	20.0	19.5
Control	pH	8.2	8.4	
	O <sub>2</sub> ppm	9.4	9.2	
	Cond.	300	301	
	Temp(C)	19.0	20.0	19.5

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920088 Test Number: 2  
Company : Environment Canada Tire Study (3999999949)  
Region :  
Control point : Scrap Tire A, (400)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/17/92  
Received : 02/17/92  
Tested : 02/17/92  
Time : 1520  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
25	0	0	0	0
13	0	0	0	0
6	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920088

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.4
	O <sub>2</sub> ppm	9.4	9.2
	Cond.	502	479
	Temp(C)	19.0	20.0
			19.5
50	pH	8.4	8.5
	O <sub>2</sub> ppm	9.4	9.2
	Cond.	402	396
	Temp(C)	19.0	20.0
			19.5
25	pH	8.3	8.4
	O <sub>2</sub> ppm	9.4	9.2
	Cond.	350	348
	Temp(C)	19.0	20.0
			19.5
13	pH	8.3	8.4
	O <sub>2</sub> ppm	9.3	9.2
	Cond.	324	325
	Temp(C)	19.0	20.0
			19.5
6	pH	8.3	8.4
	O <sub>2</sub> ppm	9.3	9.2
	Cond.	312	312
	Temp(C)	19.0	20.0
			19.5
Control	pH	8.2	8.4
	O <sub>2</sub> ppm	9.4	9.3
	Cond.	300	304
	Temp(C)	19.0	20.0
			19.5

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## **APPENDIX 2b**

Series B (10 day exposure)

- Rainbow trout
- *Daphnia magna*

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920096 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region : , ONT  
Control point : Control B 10 à exp\*, (500)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1530  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.60  
Length(mm) : 43.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920096

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.2
	O2 ppm	9.9		9.2
	Cond.	440		446
	Temp(C)	15.5	15.0	15.0
100	pH	8.4		8.3
	O2 ppm	9.9		9.5
	Cond.	440		447
	Temp(C)	15.5	15.0	15.0
Control	pH	7.9		8.5
	O2 ppm	9.6		9.8
	Cond.	528		521
	Temp(C)	15.5	15.0	15.0
Control	pH	7.9		8.4
	O2 ppm	9.6		9.4
	Cond.	528		525
	Temp(C)	15.5	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920097 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : Reef Tire B\*, (600)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1535

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.60  
Length(mm) : 43.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY %
	%	00:00	24:00	48:00	72:00	
100	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920097

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5		8.4	
	O2 ppm	10.0		9.6	
	Cond.	511		522	
	Temp(C)	15.5	15.0	15.0	15.5
50	pH	8.2		8.2	
	O2 ppm	9.8		9.1	
	Cond.	522		527	
	Temp(C)	15.5	15.0	15.0	15.5
25	pH	8.0		8.3	
	O2 ppm	9.7		9.1	
	Cond.	525		528	
	Temp(C)	15.5	15.0	15.0	15.5
13	pH	8.0		8.4	
	O2 ppm	9.7		9.7	
	Cond.	526		521	
	Temp(C)	15.5	15.0	15.0	15.5
6	pH	7.9		8.5	
	O2 ppm	9.7		9.8	
	Cond.	526		520	
	Temp(C)	15.5	15.0	15.0	15.5
Control	pH	7.9		8.3	
	O2 ppm	9.7		9.5	
	Cond.	527		522	
	Temp(C)	15.5	15.0	15.0	15.5

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920099 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region : , ONT  
Control point : Scrap Tire Bx, (800)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1545  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.60  
Length(mm) : 43.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	10	10	10	10		100
50	0	10	10	10	10		100
25	0	1	9	10	10		100
13	0	0	0	2	3		30
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper              Lower

15.10000

25.00000

6.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920099

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4	8.4		
	O2 ppm	10.1	9.8		
	Cond.	477	478		
	Temp(C)	15.5	15.0		
50	pH	8.1	8.4		
	O2 ppm	9.8	9.9		
	Cond.	494	499		
	Temp(C)	15.5	15.0		
25	pH	8.0	8.4		
	O2 ppm	9.7	9.5		
	Cond.	508	514		
	Temp(C)	15.5	15.0	15.0	15.0
13	pH	8.0		8.5	
	O2 ppm	9.7		9.9	
	Cond.	515		515	
	Temp(C)	15.5	15.0	15.0	15.5
5	pH	7.9		8.3	
	O2 ppm	9.6		9.5	
	Cond.	520		526	
	Temp(C)	15.5	15.0	15.0	15.5
Control	pH	8.0		8.4	
	O2 ppm	9.6		9.8	
	Cond.	521		530	
	Temp(C)	15.5	15.0	15.0	15.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920098 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : New Tire B\*, (700)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1540

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.60  
Length(mm) : 43.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00	
100	0	0	10	10	10		100
50	0	0	3	4	4		40
25	0	0	0	0	0		0
13	0	0	0	0	0		0
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper              Lower

54.60000            100.00000        25.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920098

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.4	8.5		
	O <sub>2</sub> ppm	9.9	9.6		
	Cond.	503	504		
	Temp(C)	15.5	15.0	15.0	
50	pH	8.1		8.4	
	O <sub>2</sub> ppm	9.6		10.0	
	Cond.	512		514	
	Temp(C)	15.5	15.0	15.0	15.5
25	pH	8.1		8.4	
	O <sub>2</sub> ppm	9.5		9.8	
	Cond.	520		520	
	Temp(C)	15.5	15.0	15.0	15.5
13	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.5		10.0	
	Cond.	523		517	
	Temp(C)	15.5	15.0	15.0	15.5
6	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.5		9.6	
	Cond.	524		522	
	Temp(C)	15.5	15.0	15.0	15.5
Control	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.6		10.0	
	Cond.	525		523	
	Temp(C)	15.5	15.0	15.0	15.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

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## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920096 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Control B - 10 d exp., (500)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1420  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY
%	00:00	24:00	48:00	%	%
100	0	0	0		0
100	0	0	0		0
Control	0	0	0		0
Control	0	0	0		0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920096

Test NUMBER: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.5
	O2 ppm	9.3	8.8
	Cond.	430	467
	Temp(C)	20.0	20.0

100	pH	8.4	8.5
	O2 ppm	9.3	8.8
	Cond.	430	469
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O2 ppm	9.0	9.1
	Cond.	299	303
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O2 ppm	9.0	9.0
	Cond.	299	304
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920097 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Reet Tire B, (600)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1420  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920097

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.3	9.0
	Cond.	496	501
	Temp(C)	20.0	20.0
100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.3	9.0
	Cond.	496	502
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.0
	Cond.	299	304
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.0
	Cond.	299	302
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920099 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Scrap Tire B, (800)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1430  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920099

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100 pH 8.5 8.9  
O2 ppm 9.3 9.0  
Cond. 464 465  
Temp(C) 20.0 20.0 20.0

100 pH 8.5 8.5  
O2 ppm 9.3 9.0  
Cond. 464 465  
Temp(C) 20.0 20.0 20.0

Control pH 8.5 8.5  
O2 ppm 9.0 9.0  
Cond. 299 301  
Temp(C) 20.0 20.0 20.0

Control pH 8.5 8.5  
O2 ppm 9.0 9.0  
Cond. 299 302  
Temp(C) 20.0 20.0 20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

. . . 3

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920098 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : New Tire E, (700)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1425  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920098

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.3	8.9
	Cond.	491	484
	Temp(C)	20.0	20.0

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.3	8.9
	Cond.	491	487
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.0
	Cond.	299	302
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.0
	Cond.	299	303
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## **APPENDIX 2c**

Series C (20 day exposure)

- Rainbow trout
- *Daphnia magna*
- Fathead minnow

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920121 Test Number: 1

Company : Environment Canada Tire Study (3999999949)  
Region : , ONT

Control point : Control C 20 d exp\*, (900)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1215

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.75  
Length(mm) : 45.70

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920121

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.4		8.3	
	O <sub>2</sub> ppm	10.2		9.8	
	Cond.	411		421	
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	8.4		8.3	
	O <sub>2</sub> ppm	10.2		9.9	
	Cond.	412		420	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.4		10.0	
	Cond.	526		523	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.4		9.8	
	Cond.	528		529	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920122 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : Reef Tire C\*, (1000)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1225

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.75  
Length(mm) : 45.70

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY %
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920122

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5		8.3	
	O2 ppm	10.0		9.5	
	Cond.	498		514	
	Temp(C)	15.0	15.0	15.0	15.0
50	pH	8.2		8.4	
	O2 ppm	9.8		9.7	
	Cond.	510		518	
	Temp(C)	15.0	15.0	15.0	15.0
25	pH	8.1		8.3	
	O2 ppm	9.6		9.2	
	Cond.	518		527	
	Temp(C)	15.0	15.0	15.0	15.0
13	pH	8.0		8.2	
	O2 ppm	9.5		8.6	
	Cond.	522		531	
	Temp(C)	15.0	15.0	15.0	15.0
6	pH	8.0		8.2	
	O2 ppm	9.5		8.7	
	Cond.	524		530	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	8.0		8.4	
	O2 ppm	9.5		9.9	
	Cond.	527		527	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920124 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : Scrap Tire C\*, (1200)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1415

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.75  
Length(mm) : 45.70

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	10	10	10	10		100
50	0	10	10	10	10		100
25	0	3	10	10	10		100
13	0	0	0	0	1		10
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

16.80000      25.00000      13.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920124

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.2	8.2		
	O <sub>2</sub> ppm	9.3	9.4		
	Cond.	471	477		
	Temp(C)	15.5	15.0		
50	pH	8.1	8.3		
	O <sub>2</sub> ppm	9.6	9.9		
	Cond.	502	497		
	Temp(C)	15.5	15.0		
25	pH	8.0	8.4		
	O <sub>2</sub> ppm	9.5	9.3		
	Cond.	517	512		
	Temp(C)	15.5	15.0	15.0	
13	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.4		9.7	
	Cond.	526		512	
	Temp(C)	15.5	15.0	15.0	15.0
6	pH	7.9		8.4	
	O <sub>2</sub> ppm	9.4		9.7	
	Cond.	530		515	
	Temp(C)	15.5	15.0	15.0	15.0
Control	pH	8.0		8.3	
	O <sub>2</sub> ppm	9.5		9.6	
	Cond.	537		525	
	Temp(C)	15.5	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920123 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : New Tire C\*, (1100)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1320

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.75  
Length(mm) : 45.70

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	3	10	10	10		100
50	0	0	1	3	3		30
25	0	0	0	1	1		10
13	0	0	0	0	0		0
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

52.10000

70.60000

38.79000

TOXICITY TEST PARAMETERS

Sample Number: 03920123 Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.3	8.2		
	O <sub>2</sub> ppm	10.0	9.2		
	Cond.	444	450		
	Temp(C)	15.0	15.0	15.0	
50	pH	8.1		8.4	
	O <sub>2</sub> ppm	9.8		9.8	
	Cond.	482		491	
	Temp(C)	15.0	15.0	15.0	15.0
25	pH	8.0		8.2	
	O <sub>2</sub> ppm	9.6		9.1	
	Cond.	501		511	
	Temp(C)	15.0	15.0	15.0	15.0
13	pH	8.0		8.3	
	O <sub>2</sub> ppm	9.5		9.4	
	Cond.	513		521	
	Temp(C)	15.0	15.0	15.0	15.0
6	pH	8.0		8.2	
	O <sub>2</sub> ppm	9.4		9.4	
	Cond.	519		527	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	8.0		8.3	
	O <sub>2</sub> ppm	9.4		9.6	
	Cond.	527		533	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920121 Test Number: 2

Company : Environment Canada Tire Study (399999949)

Region :

Control point : Control C - 20 d exp., (900)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/03/92

Received : 03/03/92

Tested : 03/03/92

Time : 1200

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)

Test Animal : D. magna

Weight(gm) : 0.00

Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920121

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100 pH 8.4 8.5  
O<sub>2</sub> ppm 9.9 9.2  
Cond. 401 404  
Temp(C) 20.0 20.0 20.0

100 pH 8.4 8.5  
O<sub>2</sub> ppm 9.9 9.2  
Cond. 401 406  
Temp(C) 20.0 20.0 20.0

Control pH 8.2 8.4  
O<sub>2</sub> ppm 9.4 9.1  
Cond. 300 300  
Temp(C) 20.0 20.0 20.0

Control pH 8.2 8.3  
O<sub>2</sub> ppm 9.4 9.2  
Cond. 300 301  
Temp(C) 20.0 20.0 20.0

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920122 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Reef Tire C, (1000)  
Laboratory : BAR  
Sampling Method : Crab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1205  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY %
	%	00:00	24:00	48:00
100	0	0	0	0
50	0	0	0	0
25	0	0	0	0
13	0	0	0	0
6	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper              Lower

Non-lethal

SLOPE of Mortality Curve : -0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920122

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.5	8.6
	O2 ppm	9.6	9.2
	Cond.	476	491
	Temp(C)	20.0	20.0
50	pH	8.4	8.5
	O2 ppm	9.7	9.2
	Cond.	389	397
	Temp(C)	20.0	20.0
25	pH	8.4	8.4
	O2 ppm	9.7	9.2
	Cond.	339	347
	Temp(C)	20.0	20.0
13	pH	8.3	8.4
	O2 ppm	9.6	9.2
	Cond.	320	325
	Temp(C)	20.0	20.0
6	pH	8.3	8.4
	O2 ppm	9.6	9.2
	Cond.	312	312
	Temp(C)	20.0	20.0
Control	pH	8.2	8.4
	O2 ppm	9.4	9.2
	Cond.	300	304
	Temp(C)	20.0	20.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920124 Test Number: A  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Scrap Tire C, (1200)  
Laboratory : BAR  
Sampling Method : Crab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1340  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
25	0	0	0	0
13	0	0	0	0
6	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920124

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.3	8.4
	O <sub>2</sub> ppm	9.4	9.0
	Cond.	455	456
	Temp(C)	20.0	20.0
50	pH	8.3	8.4
	O <sub>2</sub> ppm	9.6	9.0
	Cond.	375	378
	Temp(C)	20.0	20.0
25	pH	8.3	8.4
	O <sub>2</sub> ppm	9.6	9.1
	Cond.	331	337
	Temp(C)	20.0	20.0
13	pH	8.4	8.4
	O <sub>2</sub> ppm	9.6	9.1
	Cond.	313	320
	Temp(C)	20.0	20.0
6	pH	8.4	8.4
	O <sub>2</sub> ppm	9.7	9.1
	Cond.	306	313
	Temp(C)	20.0	20.0
Control	pH	8.2	8.4
	O <sub>2</sub> ppm	9.4	9.2
	Cond.	300	298
	Temp(C)	20.0	20.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920123 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : New Tire C, (1100)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1335  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
25	0	0	0	0
13	0	0	0	0
6	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920123

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.3	8.5
	O2 ppm	9.6	9.0
	Cond.	420	431
	Temp(C)	20.0	20.0
50	pH	8.3	8.4
	O2 ppm	9.6	9.1
	Cond.	359	366
	Temp(C)	20.0	20.0
25	pH	8.3	8.4
	O2 ppm	9.7	9.1
	Cond.	326	331
	Temp(C)	20.0	20.0
13	pH	8.3	8.4
	O2 ppm	9.6	9.1
	Cond.	312	316
	Temp(C)	20.0	20.0
6	pH	8.3	8.4
	O2 ppm	9.6	9.1
	Cond.	320	308
	Temp(C)	20.0	20.0
Control	pH	8.2	8.4
	O2 ppm	9.4	9.2
	Cond.	300	303
	Temp(C)	20.0	20.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920121 Test Number: 3

Company : Environment Canada Tire Study (3999999949)

Region :

Control point : Control C - 20 d exp., (900)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/03/92

Received : 03/03/92

Tested : 03/03/92

Time : 1545

Test Animal : Fathead Minnow

Weight(gm) : 0.31

Length(mm) : 33.80

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
Control	0	0	0	0	0	0

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920121

Test Number: 3

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.5	
	O <sub>2</sub> ppm	9.9		9.0	
	Cond.	401		403	
	Temp(C)	20.0	20.0	20.0	20.0

Control	pH	8.2		8.2	
	O <sub>2</sub> ppm	9.4		8.0	
	Cond.	500		492	
	Temp(C)	20.0	20.0	20.0	20.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

...3

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920122 Test Number: 3

Company : Environment Canada Tire Study (3999999949)

Region :

Control point : Reef Tire C, (1000)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/03/92

Received : 03/03/92

Tested : 03/03/92

Time : 1545

Test Animal : Fathead Minnow

Weight(gm) : 0.31

Length(mm) : 33.80

MORTALITY DATA

TEST CONC.	E L A P S E D   T I M E						TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00	
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

95 % Confidence Limits  
Upper              Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920122

Test Number: 3

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5		8.4	
	O <sub>2</sub> ppm	9.6		7.5	
	Cond.	478		493	
	Temp(C)	20.0	20.0	20.0	20.0

Control	pH	8.2		8.2	
	O <sub>2</sub> ppm	9.4		8.0	
	Cond.	500		492	
	Temp(C)	20.0	20.0	20.0	20.0

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

...3

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920124 Test Number: 3

Company : Environment Canada Tire Study (399999949)

Region :

Control point : Scrap Tire C, (1200)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/03/92

Received : 03/03/92

Tested : 03/03/92

Time : 1545

Test Animal : Fathead Minnow

Weight(gm) : 0.31

Length(mm) : 33.80

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
Control	0	0	0	0	0	0

95 % Confidence Limits  
Upper              Lower

Non-lethal

SLOPE of Mortality Curve : .0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920124

Test Number: 3

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.3		8.5	
	O <sub>2</sub> ppm	9.4		8.9	
	Cond.	455		451	
	Temp(C)	20.0	20.0	20.0	20.0

Control	pH	8.2		8.2	
	O <sub>2</sub> ppm	9.4		8.0	
	Cond.	500		492	
	Temp(C)	20.0	20.0	20.0	20.0

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920123 Test Number: 3

Company : Environment Canada Tire Study (3999999949)

Region :

Control point : New Tire C, (1100)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/03/92

Received : 03/03/92

Tested : 03/03/92

Time : 1545

Test Animal : Fathead Minnow

Weight(gm) : 0.31

Length(mm) : 33.80

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
Control	0	0	0	0	0	0

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920123

Test Number: 3

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.3		9.5	
	O <sub>2</sub> ppm	9.6		8.8	
	Cond.	420		431	
	Temp(C)	20.0	20.0	20.0	20.0

Control	pH	8.2		8.2	
	O <sub>2</sub> ppm	9.4		8.0	
	Cond.	500		492	
	Temp(C)	20.0	20.0	20.0	20.0

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

## **APPENDIX 2d**

Series D (40 day exposure)

- Rainbow trout
- *Daphnia magna*
- Fathead minnow

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920157 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : Control D 40 d exp\*, (1300)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/23/92  
Time : 1450

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.63  
Length(mm) : 40.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920157

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.5		8.4	
	O <sub>2</sub> ppm	10.0		10.0	
	Cond.	368		378	
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	8.5		8.4	
	O <sub>2</sub> ppm	10.1		9.9	
	Cond.	369		381	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8		8.4	
	O <sub>2</sub> ppm	8.1		9.4	
	Cond.	528		521	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8		8.5	
	O <sub>2</sub> ppm	8.5		10.0	
	Cond.	522		507	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : **B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920158 Test Number: 1

Company : Environment Canada Tire Study (3999999949)  
Region : , ONT

Control point : Reef Tire D\*, (1400)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/23/92  
Time : 1455

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.63  
Length(mm) : 40.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920158

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.5		8.3	
	O <sub>2</sub> ppm	10.1		9.1	
	Cond.	489		504	
	Temp(C)	15.0	15.0	15.0	15.0
50	pH	8.2		8.5	
	O <sub>2</sub> ppm	9.5		10.0	
	Cond.	505		507	
	Temp(C)	15.0	15.0	15.0	15.0
25	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.3		10.1	
	Cond.	513		510	
	Temp(C)	15.0	15.0	15.0	15.0
13	pH	7.9		8.2	
	O <sub>2</sub> ppm	9.0		8.6	
	Cond.	517		514	
	Temp(C)	15.0	15.0	15.0	15.0
6	pH	7.9		8.4	
	O <sub>2</sub> ppm	9.0		9.5	
	Cond.	519		515	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8		8.4	
	O <sub>2</sub> ppm	8.9		9.6	
	Cond.	530		515	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : **B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920160 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region : , ONT  
Control point : Scrap Tire D\*, (1600)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/23/92  
Time : 1507  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.63  
Length(mm) : 40.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	
100	0	10	10	10	10		100
50	0	10	10	10	10		100
25	0	4	10	10	10		100
13	0	0	2	6	6		60
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

11.80000

25.00000

6.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920160

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.4	8.2		
	O <sub>2</sub> ppm	10.2	8.8		
	Cond.	398	422		
	Temp(C)	15.0	15.0	15.0	
50	pH	8.1	8.3		
	O <sub>2</sub> ppm	9.7	8.6		
	Cond.	462	485		
	Temp(C)	15.0	15.0	15.0	
25	pH	8.0	8.4		
	O <sub>2</sub> ppm	9.5	9.6		
	Cond.	494	489		
	Temp(C)	15.0	15.0	15.0	
13	pH	7.9	8.5	8.6	
	O <sub>2</sub> ppm	9.4	10.1	10.1	
	Cond.	511	501	497	
	Temp(C)	15.0	15.0	15.0	15.0
6	pH	7.9	8.5		
	O <sub>2</sub> ppm	9.3	9.8		
	Cond.	521	506		
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8	8.5		
	O <sub>2</sub> ppm	9.2	10.0		
	Cond.	532	512		
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920159 Test Number: 1

Company : Environment Canada Tire Study (3999999949)  
Region : , ONT

Control point : New Tire D\*, (1500)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/23/92  
Time : 1502

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.63  
Length(mm) : 40.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	7	8	8	80
50	0	0	0	0	0	0
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper              Lower

80.40000

0.00000

0.00000

Confidence limits &gt; 50

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By : Binomial

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920159 Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.2	8.4	8.4	
	O <sub>2</sub> ppm	9.6	9.5	9.8	
	Cond.	442	456	448	
	Temp(C)	15.0	15.0	15.0	15.0
50	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.5		10.0	
	Cond.	483		479	
	Temp(C)	15.0	15.0	15.0	15.0
25	pH	7.9		8.5	
	O <sub>2</sub> ppm	9.5		10.0	
	Cond.	502		494	
	Temp(C)	15.0	15.0	15.0	15.0
13	pH	7.9		8.4	
	O <sub>2</sub> ppm	9.4		9.7	
	Cond.	511		505	
	Temp(C)	15.0	15.0	15.0	15.0
6	pH	7.8		8.5	
	O <sub>2</sub> ppm	9.4		9.7	
	Cond.	514		513	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8		8.5	
	O <sub>2</sub> ppm	9.3		9.9	
	Cond.	522		521	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920157 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Control D - 40 d exp., (1300)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/24/92  
Time : 1120  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920157

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.5	8.6
	O2 ppm	9.6	8.9
	Cond.	362	373
	Temp(C)	20.0	20.0
100	pH	8.5	8.6
	O2 ppm	9.6	8.9
	Cond.	362	370
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O2 ppm	9.3	9.0
	Cond.	300	298
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O2 ppm	9.3	8.9
	Cond.	300	298
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920150 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Reef Tire D, (1400)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/24/92  
Time : 1130  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920158

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.5	9.0
	Cond.	484	487
	Temp(C)	20.0	20.0
100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.5	9.0
	Cond.	484	484
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	9.0
	Cond.	300	298
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	9.0
	Cond.	300	298
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920160 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Scrap Tire D, (1600)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/24/92  
Time : 1150  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
25	0	0	0	0
13	0	0	0	0
6	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920160

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.5	8.6
	O2 ppm	9.6	8.9
	Cond.	396	402
	Temp(C)	20.0	20.0
50	pH	8.5	8.5
	O2 ppm	9.6	8.9
	Cond.	360	334
	Temp(C)	20.0	20.0
25	pH	8.5	8.5
	O2 ppm	9.3	9.0
	Cond.	325	321
	Temp(C)	20.0	20.0
13	pH	8.5	8.5
	O2 ppm	9.3	9.1
	Cond.	311	311
	Temp(C)	20.0	20.0
6	pH	8.5	8.5
	O2 ppm	9.2	9.1
	Cond.	305	306
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O2 ppm	9.3	9.1
	Cond.	300	298
	Temp(C)	20.0	20.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920159 Test Number: 2  
Company : Environment Canada Tire Study (3999999949)  
Region :  
Control point : New Tire D, (1500)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/24/92  
Time : 1140  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
25	0	0	0	0
13	0	0	0	0
6	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920159

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.3	8.6
	O <sub>2</sub> ppm	9.4	8.9
	Cond.	438	439
	Temp(C)	20.0	20.0
50	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.9
	Cond.	386	343
	Temp(C)	20.0	20.0
25	pH	8.5	8.5
	O <sub>2</sub> ppm	9.4	9.0
	Cond.	345	319
	Temp(C)	20.0	20.0
13	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.9
	Cond.	320	309
	Temp(C)	20.0	20.0
6	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.9
	Cond.	310	302
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	9.0
	Cond.	300	298
	Temp(C)	20.0	20.0

TEST CONDUCTED BY :

**B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920157 Test Number: 3

Company : Environment Canada Tire Study (3999999949)

Region :

Control point : Control D - 40 d exp., (1300)

Laboratory : BAR

Sampling Method : Grab

Sampled By : K. Holtze

Date Collected : 03/23/92

Received : 03/23/92

Tested : 03/26/92

Time : 1130

Test Animal : Fathead Minnow

Weight(gm) : 0.33

Length(mm) : 35.30

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY %
	%	00:00	24:00	48:00	72:00	96:00	
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

95 % Confidence Limits  
Upper            Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920157

Test Number: 3

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5		8.5	
	O <sub>2</sub> ppm	9.4		9.1	
	Cond.	366		382	
	Temp(C)	20.0	19.5	19.5	19.5

Control	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.9		9.3	
	Cond.	545		519	
	Temp(C)	20.0	19.5	19.5	19.5

**B.A.R. ENVIRONMENTAL**

TEST CONDUCTED BY : \_\_\_\_\_

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920158 Test Number: 5

Company : Environment Canada Tire Study (399999949)

Region :

Control point : Reef Tire D, (1400)

Laboratory : BAR

Sampling Method : Grab

Sampled By : K. Holtze

Date Collected : 03/23/92

Received : 03/23/92

Tested : 03/26/92

Time : 1110

Test Animal : Fathead Minnow

Weight(gm) : 0.33

Length(mm) : 35.30

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
Control	0	0	0	0	0	0

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920158

Test Number: 3

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.5		8.6	
	O <sub>2</sub> ppm	9.3		9.1	
	Cond.	481		483	
	Temp(C)	20.0	19.5	19.5	19.5

Control	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.8		9.3	
	Cond.	545		519	
	Temp(C)	20.0	19.5	19.5	19.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

...3

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920160

Test Number: 3

Company : Environment Canada Tire Study (399999949)

Region :

Control point : Scrap Tire D, (1600)

Laboratory : BAR

Sampling Method : Grab

Sampled By : K. Holtze

Date Collected : 03/23/92

Received : 03/23/92

Tested : 03/26/92

Time : 1130

Test Animal : Fathead Minnow

Weight(gm) : 0.33

Length(mm) : 35.30

MORTALITY DATA

TEST CONC.	E L A P S E D   T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
Control	0	0	0	0	0	0

95 % Confidence Limits  
Upper              Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920160

Test Number: 3

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5		8.4	
	O <sub>2</sub> ppm	9.5		8.2	
	Cond.	398		419	
	Temp(C)	20.0	19.5	19.5	19.5

Control	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.9		9.3	
	Cond.	545		519	
	Temp(C)	20.0	19.5	19.5	19.5

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

...3

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920159 Test Number: 3

Company : Environment Canada Tire Study (399999949)

Region :

Control point : New Tire D, (1500)

Laboratory : BAR

Sampling Method : Grab

Sampled By : K. Holtze

Date Collected : 03/23/92

Received : 03/23/92

Tested : 03/26/92

Time : 1130

Test Animal : Fathead Minnow

Weight(gm) : 0.33

Length(mm) : 35.30

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
Control	0	0	0	0	0	0

95 % Confidence Limits  
Upper              Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920159

Test Number: 3

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.3		8.5	
	O <sub>2</sub> ppm	9.5		9.0	
	Cond.	434		447	
	Temp(C)	20.0	19.5	19.5	19.5

Control	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.9		9.3	
	Cond.	545		519	
	Temp(C)	20.0	19.5	19.5	19.5

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY :

...3

## **APPENDIX 3**

### **Raw Data Reports for Tests on Leachate Concentrates**

## **APPENDIX 3a**

5 day post exposure

- Rainbow trout
- *Daphnia magna*

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920092 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : Control A 5 d conc.\*, (105)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1530

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.60  
Length(mm) : 43.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920092

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.2	
	O2 ppm	10.0		8.9	
	Cond.	454		461	
	Temp(C)	15.5	15.0	15.0	15.0
100	pH	8.4		8.2	
	O2 ppm	10.0		9.1	
	Cond.	454		463	
	Temp(C)	15.5	15.0	15.0	15.0
Control	pH	7.9		8.2	
	O2 ppm	9.8		8.6	
	Cond.	530		523	
	Temp(C)	15.5	15.0	15.0	15.0
Control	pH	7.9		8.4	
	O2 ppm	9.8		9.3	
	Cond.	530		517	
	Temp(C)	15.5	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920093 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
, ONT

Region :

Control point : Reef A 5 d conc.\*, (205)

Laboratory : BAR

Sampling Method : Grab

Sampled By : D.VanDenKieboom

Date Collected : 02/22/92

Received : 02/22/92

Tested : 02/22/92

Time : 1535

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.60

Length(mm) : 43.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920093

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.2	
	O2 ppm	10.0		9.0	
	Cond.	478		494	
	Temp(C)	15.5	15.0	15.0	15.0
50	pH	8.1		8.5	
	O2 ppm	9.8		9.8	
	Cond.	503		506	
	Temp(C)	15.5	15.0	15.0	15.0
25	pH	8.0		8.4	
	O2 ppm	9.7		9.6	
	Cond.	514		517	
	Temp(C)	15.5	15.0	15.0	15.0
13	pH	8.0		8.3	
	O2 ppm	9.7		9.6	
	Cond.	520		523	
	Temp(C)	15.5	15.0	15.0	15.0
6	pH	8.0		8.4	
	O2 ppm	9.7		9.8	
	Cond.	524		520	
	Temp(C)	15.5	15.0	15.0	15.0
Control	pH	7.9		8.2	
	O2 ppm	9.7		9.0	
	Cond.	527		528	
	Temp(C)	15.5	15.0	15.0	15.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920095 Test Number: 1

Company : Environment Canada Tire Study (3999999949)  
Region : , ONT

Control point : Scrap A 5 d conc.\*, (405)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1545

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.60  
Length(mm) : 43.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	10	10	10	10	100
50	0	10	10	10	10	100
25	0	5	10	10	10	100
13	0	0	0	1	2	20
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

16.00000

25.00000

6.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920095

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.4	8.5		
	O <sub>2</sub> ppm	10.1	9.8		
	Cond.	482	485		
	Temp(C)	15.5	15.0		
50	pH	8.2	8.4		
	O <sub>2</sub> ppm	9.7	9.7		
	Cond.	504	503		
	Temp(C)	15.5	15.0		
25	pH	8.1	8.4	8.5	
	O <sub>2</sub> ppm	9.5	9.6	9.5	
	Cond.	512	512	512	
	Temp(C)	15.5	15.0	15.0	
13	pH	8.0			8.4
	O <sub>2</sub> ppm	9.5			9.8
	Cond.	519			516
	Temp(C)	15.5	15.0	15.0	15.0
6	pH	8.0			8.5
	O <sub>2</sub> ppm	9.5			9.9
	Cond.	523			519
	Temp(C)	15.5	15.0	15.0	15.0
Control	pH	8.0			8.4
	O <sub>2</sub> ppm	9.6			9.8
	Cond.	524			527
	Temp(C)	15.5	15.0	15.0	15.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920094 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : New A 5 d conc.\*, (305)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1540

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.60  
Length(mm) : 43.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	9	9	9	90
50	0	0	1	2	3	30
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

61.80000

82.79000

46.48000

TOXICITY TEST PARAMETERS

Sample Number: 03920094

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4	8.4		
	O2 ppm	9.9	9.4		
	Cond.	499	503		
	Temp(C)	15.5	15.0	15.0	15.5
50	pH	8.1		8.4	
	O2 ppm	9.7		9.9	
	Cond.	511		517	
	Temp(C)	15.5	15.0	15.0	15.5
25	pH	8.0		8.5	
	O2 ppm	9.6		9.9	
	Cond.	515		517	
	Temp(C)	15.5	15.0	15.0	15.5
13	pH	8.0		8.4	
	O2 ppm	9.5		9.5	
	Cond.	520		523	
	Temp(C)	15.5	15.0	15.0	15.5
6	pH	8.0		8.5	
	O2 ppm	9.6		9.7	
	Cond.	522		520	
	Temp(C)	15.5	15.0	15.0	15.5
Control	pH	7.9		8.4	
	O2 ppm	9.6		9.5	
	Cond.	520		528	
	Temp(C)	15.5	15.0	15.0	15.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920092 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Control A 5 d concentrate, (105)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1400  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920092

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.3	9.0
	Cond.	445	449
	Temp(C)	20.0	20.0
100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.3	8.9
	Cond.	445	449
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.0
	Cond.	299	301
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.0
	Cond.	299	302
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920093 Test Number: 2  
Company : Environment Canada Tire Study (3999999949)  
Region :  
Control point : Reef A 5 d concentrate, (205)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1405  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920093

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100 pH 8.5 8.5  
O<sub>2</sub> ppm 9.3 9.0  
Cond. 466 472  
Temp(C) 20.0 20.0 20.0

100 pH 8.5 8.5  
O<sub>2</sub> ppm 9.3 9.0  
Cond. 466 470  
Temp(C) 20.0 20.0 20.0

Control pH 8.5 8.5  
O<sub>2</sub> ppm 9.0 8.9  
Cond. 299 302  
Temp(C) 20.0 20.0 20.0

Control pH 8.5 8.5  
O<sub>2</sub> ppm 9.0 9.0  
Cond. 299 303  
Temp(C) 20.0 20.0 20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920095 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Scrap A 5 d concentrate, (405)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1415  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920095

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.5	8.4
	O <sub>2</sub> ppm	9.3	8.9
	Cond.	471	468
	Temp(C)	20.0	20.0
100	pH	8.5	8.4
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	471	464
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	8.9
	Cond.	299	302
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.1
	Cond.	299	303
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920094 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : New A 5 d concentrate, (305)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/22/92  
Received : 02/22/92  
Tested : 02/22/92  
Time : 1410  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920094

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.5	8.4
	O <sub>2</sub> ppm	9.3	9.0
	Cond.	494	478
	Temp(C)	20.0	20.0
100	pH	8.5	8.4
	O <sub>2</sub> ppm	9.3	8.9
	Cond.	494	478
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.0
	Cond.	299	301
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.0	9.0
	Cond.	299	304
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## **APPENDIX 3b**

10 day post exposure

- Rainbow trout
- *Daphnia magna*

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920108 Test Number: 1

Company : Environment Canada Tire Study (3333999949)  
Region : , ONT

Control point : Control A 10 d conc.\*, (110)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 02/01/92 02/27/92  
Received : 02/01/92 02/27/92  
Tested : 02/01/92 02/27/92  
Time : 1530

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.70  
Length(mm) : 44.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920108

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

09:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.4	
	O <sub>2</sub> ppm	9.9		9.4	
	Cond.	427		439	
	Temp(C)	15.5	15.0	15.0	15.0
100	pH	8.4		8.4	
	O <sub>2</sub> ppm	9.9		9.9	
	Cond.	427		436	
	Temp(C)	15.5	15.0	15.0	14.5
Control	pH	8.0		8.3	
	O <sub>2</sub> ppm	9.8		8.8	
	Cond.	534		543	
	Temp(C)	15.5	15.0	15.0	14.5
Control	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.8		9.6	
	Cond.	534		538	
	Temp(C)	15.5	15.0	15.0	14.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920109 Test Number: 1

Company : Environment Canada Tire Study (3999999949)  
Region : , ONT

Control point : Reef A 10 d conc.\*, (210)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : ~~03/01/92~~ 02/27/92  
Received : ~~03/01/92~~ 02/27/92  
Tested : ~~03/01/92~~ 02/27/92  
Time : 1130

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.70  
Length(mm) : 44.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

---

Sample Number: 03920109 Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

---

100	pH	8.4		8.3	
	O <sub>2</sub> ppm	9.6		9.0	
	Cond.	452		474	
	Temp(C)	15.5	15.0	15.0	14.5

100	pH	8.4		8.4	
	O <sub>2</sub> ppm	9.6		9.7	
	Cond.	452		466	
	Temp(C)	15.5	15.0	15.0	14.5

Control	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.8		9.8	
	Cond.	534		543	
	Temp(C)	15.5	15.0	15.0	14.5

Control	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.8		9.7	
	Cond.	534		540	
	Temp(C)	15.5	15.0	15.0	14.5

---

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920108 Test Number: 2

Company : Environment Canada Tire Study (399999949)

Region :

Control point : Control A 10d concentrate, (110)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 02/27/92

Received : 02/27/92

Tested : ~~02/26/92~~ 02/27/92

Time : 1135

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)

Test Animal : D. magna

Weight(gm) : 0.00

Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920108

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.6
	O <sub>2</sub> ppm	9.4	8.9
	Cond.	424	419
	Temp(C)	19.5	21.0
			20.5

100	pH	8.4	8.6
	O <sub>2</sub> ppm	9.4	8.8
	Cond.	424	421
	Temp(C)	19.5	21.0
			20.5

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.2	8.9
	Cond.	303	306
	Temp(C)	19.5	21.0
			20.5

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.2	8.9
	Cond.	303	306
	Temp(C)	19.5	21.0
			20.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920109 Test Number: 2

Company : Environment Canada Tire Study (399999949)

Region :

Control point : Reef A 10d concentrate, (210)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 02/27/92

Received : 02/27/92

Tested : ~~02/26/92~~ 02/27/92

Time : 1140

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY TEST PROTOCOL OME 1988)

Test Animal : D. magna

Weight(gm) : 0.00

Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920109

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.6
	O <sub>2</sub> ppm	9.4	8.9
	Cond.	453	444
	Temp(C)	19.5	21.0
			20.5

100	pH	8.4	8.6
	O <sub>2</sub> ppm	9.4	8.9
	Cond.	453	447
	Temp(C)	19.5	21.0
			20.5

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.2	8.9
	Cond.	303	305
	Temp(C)	19.5	21.0
			20.5

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.2	8.9
	Cond.	303	305
	Temp(C)	19.5	21.0
			20.5

**B.A.R. ENVIRONMENTAL**

TEST CONDUCTED BY :

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920111 Test Number: 2

Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Scrap A 10d concentrate, (410)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 02/27/92  
Received : 02/27/92  
Tested : ~~02/26/92~~ 02/27/92  
Time : 1150

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)

Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920111

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.6
	O <sub>2</sub> ppm	9.4	8.9
	Cond.	445	443
	Temp(C)	19.5	21.0
			20.5

100	pH	8.4	8.6
	O <sub>2</sub> ppm	9.4	8.9
	Cond.	445	443
	Temp(C)	19.5	21.0
			20.5

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.2	8.9
	Cond.	303	307
	Temp(C)	19.5	21.0
			20.5

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.2	8.9
	Cond.	303	307
	Temp(C)	19.5	21.0
			20.5

**B.A.R. ENVIRONMENTAL**

TEST CONDUCTED BY : \_\_\_\_\_

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920110 Test Number: 2

Company : Environment Canada Tire Study (399999949)

Region :

Control point : New A 10d concentrate, (310)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 02/27/92

Received : 02/27/92

Tested : ~~02/26/92~~ 02/27/92

Time : 1145

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY TEST PROTOCOL OME 1988)

Test Animal : D. magna

Weight(gm) : 0.00

Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920110

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.6
	O <sub>2</sub> ppm	9.4	8.8
	Cond.	473	467
	Temp(C)	19.5	21.0
			20.5

100	pH	8.4	8.6
	O <sub>2</sub> ppm	9.4	8.9
	Cond.	473	467
	Temp(C)	19.5	21.0
			20.5

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.2	8.9
	Cond.	303	307
	Temp(C)	19.5	21.0
			20.5

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.2	8.9
	Cond.	303	304
	Temp(C)	19.5	21.0
			20.5

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

## **APPENDIX 3c**

15 day post exposure

- Rainbow trout
- *Daphnia magna*

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920125 Test Number: 1

Company : Environment Canada Tire Study (3999999949)  
, ONT

Region :

Control point : Control A 15 d conc.\*, (115)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/03/92

Received : 03/03/92

Tested : 03/03/92

Time : 1220

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. UNEP, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.75

Length(mm) : 45.70

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920125

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.3	
	O <sub>2</sub> ppm	10.1		9.6	
	Cond.	413		418	
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	8.4		8.2	
	O <sub>2</sub> ppm	10.1		9.5	
	Cond.	412		421	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	8.0		8.3	
	O <sub>2</sub> ppm	9.5		9.6	
	Cond.	525		528	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.5		10.0	
	Cond.	526		528	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920126 Test Number: 1

Company : Environment Canada Tire Study (3999999949)  
Region : , ONT

Control point : Reef A 15 d conc.\*, (215)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1425

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.75  
Length(mm) : 45.70

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920126

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.4	
	O <sub>2</sub> ppm	9.9		9.8	
	Cond.	441		447	
	Temp(C)	15.0	15.0	15.0	15.5
100	pH	8.4		8.3	
	O <sub>2</sub> ppm	9.9		9.6	
	Cond.	441		449	
	Temp(C)	15.0	15.0	15.0	15.5
Control	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.4		9.6	
	Cond.	535		516	
	Temp(C)	15.0	15.0	15.0	15.5
Control	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.4		9.8	
	Cond.	535		516	
	Temp(C)	15.0	15.0	15.0	15.5

TEST CONDUCTED BY : **B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920125 Test NUMBER: 7  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Control A 15d concentrate, (115)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1345  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920125

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100 pH 8.4 8.6  
O<sub>2</sub> ppm 9.6 9.8  
Cond. 405 392  
Temp(C) 20.0 20.0 20.0

100 pH 8.4 8.6  
O<sub>2</sub> ppm 9.6 9.0  
Cond. 405 397  
Temp(C) 20.0 20.0 20.0

Control pH 8.2 8.4  
O<sub>2</sub> ppm 9.4 8.8  
Cond. 300 297  
Temp(C) 20.0 20.0 20.0

Control pH 8.2 8.4  
O<sub>2</sub> ppm 9.4 8.9  
Cond. 300 298  
Temp(C) 20.0 20.0 20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920126 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Reef A 15d concentrate, (215)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1350  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920126

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100 pH 8.5 8.6  
O<sub>2</sub> ppm 9.7 9.0  
Cond. 431 429  
Temp(C) 20.0 20.0 20.0

100 pH 8.5 8.6  
O<sub>2</sub> ppm 9.7 9.0  
Cond. 431 433  
Temp(C) 20.0 20.0 20.0

Control pH 8.2 8.4  
O<sub>2</sub> ppm 9.4 9.0  
Cond. 300 298  
Temp(C) 20.0 20.0 20.0

Control pH 8.2 8.4  
O<sub>2</sub> ppm 9.4 9.1  
Cond. 300 304  
Temp(C) 20.0 20.0 20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920128 Test Number: 7

Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Scrap A 15d concentrate, (415)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/03/92  
Received : 03/03/92  
Tested : 03/03/92  
Time : 1315

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)

Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY %
	%	00:00	24:00	48:00
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920128

Test Number: 2

TEST CONC. %	E L A P S E D   T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.5	9.0
	Cond.	425	429
	Temp(C)	20.0	20.0

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.5	9.1
	Cond.	425	426
	Temp(C)	20.0	20.0

Control	pH	8.2	8.4
	O <sub>2</sub> ppm	9.4	9.2
	Cond.	300	298
	Temp(C)	20.0	20.0

Control	pH	8.2	8.4
	O <sub>2</sub> ppm	9.4	9.2
	Cond.	300	297
	Temp(C)	20.0	20.0

TEST CONDUCTED BY :

**B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920127 Test Number: 2

Company : Environment Canada Tire Study (399999949)

Region :

Control point : New A 15d concentrate, (315)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/03/92

Received : 03/03/92

Tested : 03/03/92

Time : 1310

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)

Test Animal : D. magna

Weight(gm) : 0.00

Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920127

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.5	9.0
	Cond.	448	450
	Temp(C)	20.0	20.0

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.5	9.0
	Cond.	448	448
	Temp(C)	20.0	20.0

Control	pH	8.2	8.4
	O <sub>2</sub> ppm	9.4	9.2
	Cond.	300	300
	Temp(C)	20.0	20.0

Control	pH	8.2	8.4
	O <sub>2</sub> ppm	9.4	9.3
	Cond.	300	301
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : **B.A.R. ENVIRONMENTAL**

## **APPENDIX 3d**

35 day post exposure

- Rainbow trout
- *Daphnia magna*

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920161 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
, ONT

Region :

Control point : Control A 35 d conc.\*, (135)

Laboratory : BAR

Sampling Method : Grab

Sampled By : K. Holtze

Date Collected : 03/23/92

Received : 03/23/92

Tested : 03/23/92

Time : 1525

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.63

Length(mm) : 40.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920161

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.2	
	O <sub>2</sub> ppm	9.9		9.2	
	Cond.	376		390	
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	8.4		8.3	
	O <sub>2</sub> ppm	9.9		9.2	
	Cond.	375		392	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8		8.5	
	O <sub>2</sub> ppm	9.2		9.4	
	Cond.	535		522	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8		8.4	
	O <sub>2</sub> ppm	9.1		9.3	
	Cond.	526		523	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

...3

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920162 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
, GNT

Region :

Control point : Reef A 35 a conc.\*, (235)

Laboratory : BAR

Sampling Method : Grab

Sampled By : K. Holtze

Date Collected : 03/23/92

Received : 03/23/92

Tested : 03/23/92

Time : 1525

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.63

Length(mm) : 40.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920162

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5		8.4	
	O <sub>2</sub> ppm	9.9		9.5	
	Cond.	414		427	
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	8.4		8.4	
	O <sub>2</sub> ppm	10.0		9.7	
	Cond.	413		427	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8		8.5	
	O <sub>2</sub> ppm	9.2		9.5	
	Cond.	535		520	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.8		8.5	
	O <sub>2</sub> ppm	9.1		9.6	
	Cond.	526		522	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920161 Test Number: 2  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Control A 35d concentrate, (100)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/24/92  
Time : 1345  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)  
Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920161

Test Number: 2

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00

100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.8	8.8
	Cond.	376	380
	Temp(C)	20.0	20.0
100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.8	8.8
	Cond.	376	379
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	300	303
	Temp(C)	20.0	20.0
Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	300	303
	Temp(C)	20.0	20.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920162 Test Number: 2

Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Reef A 35d concentrate, (235)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K. Holtze  
Date Collected : 03/23/92  
Received : 03/23/92  
Tested : 03/24/92  
Time : 1350

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)

Test Animal : D. magna  
Weight(gm) : 0.00  
Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920162

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.7	8.9
	Cond.	408	419
	Temp(C)	20.0	20.0

100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.7	8.9
	Cond.	408	420
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	300	303
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	300	303
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : **B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920164 Test Number: 2

Company : Environment Canada Tire Study (3999999949)

Region :

Control point : Scrap A 35d concentrate, (435)

Laboratory : BAR

Sampling Method : Grab

Sampled By : K. Holtze

Date Collected : 03/23/92

Received : 03/23/92

Tested : 03/24/92

Time : 1400

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)

Test Animal : D. magna

Weight(gm) : 0.00

Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920164

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.8	8.9
	Cond.	405	406
	Temp(C)	20.0	20.0

100	pH	8.5	8.6
	O <sub>2</sub> ppm	9.8	8.9
	Cond.	405	406
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	300	303
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	300	303
	Temp(C)	20.0	20.0

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920163 Test Number: 2

Company : Environment Canada Tire Study (399999949)

Region :

Control point : New A 35d concentrate, (335)

Laboratory : BAR

Sampling Method : Grab

Sampled By : K. Holtze

Date Collected : 03/23/92

Received : 03/23/92

Tested : 03/24/92

Time : 1355

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality TOXICITY  
TEST PROTOCOL OME 1988)

Test Animal : D. magna

Weight(gm) : 0.00

Length(mm) : 0.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
100	0	0	0	0
Control	0	0	0	0
Control	0	0	0	0

48 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920163

Test Number: 2

TEST CONC. %	E L A P S E D T I M E		
	00:00	24:00	48:00

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.7	8.8
	Cond.	420	418
	Temp(C)	20.0	20.0

100	pH	8.4	8.5
	O <sub>2</sub> ppm	9.7	8.7
	Cond.	420	416
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	300	303
	Temp(C)	20.0	20.0

Control	pH	8.5	8.5
	O <sub>2</sub> ppm	9.3	8.8
	Cond.	300	303
	Temp(C)	20.0	20.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## **APPENDIX 4**

**Raw Data Reports for  
Tests on Aged Leachate**

## **APPENDIX 4a**

**1 day post exposure**  
• Rainbow trout

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920101 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Scrap Tire B 1d post exp., (801)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 02/23/92  
Received : 02/23/92  
Tested : 02/23/92  
Time : 1130  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.62  
Length(mm) : 43.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	10	10	10	10		100
50	0	10	10	10	10		100
25	0	3	10	10	10		100
13	0	0	1	2	2		20
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

15.90000

25.00000      13.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920101

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4	8.5		
	O2 ppm	10.1	9.4		
	Cond.	469	477		
	Temp(C)	15.5	15.0		
50	pH	8.1	8.3		
	O2 ppm	9.8	9.2		
	Cond.	505	507		
	Temp(C)	15.5	15.0		
25	pH	8.0	8.4		
	O2 ppm	9.6	9.6		
	Cond.	521	524		
	Temp(C)	15.5	15.0	15.0	
13	pH	7.9		8.5	
	O2 ppm	9.6		9.4	
	Cond.	528		526	
	Temp(C)	15.5	15.0	15.0	15.5
6	pH	7.9		8.5	
	O2 ppm	9.6		9.5	
	Cond.	532		525	
	Temp(C)	15.5	15.0	15.0	15.5
Control	pH	7.9		8.5	
	O2 ppm	9.6		9.5	
	Cond.	537		525	
	Temp(C)	15.5	15.0	15.0	15.5

TEST CONDUCTED BY : **B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920100 Test Number: 1

Company : Environment Canada Tire Study (399999949)

Region :

Control point : New Tire B 1d post exp., (701)

Laboratory : BAR

Sampling Method : Grab

Sampled By : D.VanDenKieboom

Date Collected : 02/23/92

Received : 02/23/92

Tested : 02/23/92

Time : 1125

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.62

Length(mm) : 43.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	10	10	10	100
50	0	0	1	3	4	40
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

54.60000      100.00000      25.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920100

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4	8.5		
	O2 ppm	10.0	9.7		
	Cond.	501	506		
	Temp(C)	15.5	15.0	15.0	
50	pH	8.1		8.5	
	O2 ppm	9.7		9.1	
	Cond.	520		520	
	Temp(C)	15.5	15.0	15.0	15.5
25	pH	8.0		8.5	
	O2 ppm	9.6		9.3	
	Cond.	524		525	
	Temp(C)	15.5	15.0	15.0	15.5
13	pH	7.9		8.5	
	O2 ppm	9.5		9.3	
	Cond.	526		531	
	Temp(C)	15.5	15.0	15.0	15.5
6	pH	7.9		8.5	
	O2 ppm	9.5		9.5	
	Cond.	528		530	
	Temp(C)	15.5	15.0	15.0	15.5
Control	pH	7.9		8.5	
	O2 ppm	9.5		9.4	
	Cond.	533		529	
	Temp(C)	15.5	15.0	15.0	15.5

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## **APPENDIX 4b**

2 day post exposure  
• Rainbow trout

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920103 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : Scrap Tire B 2d post exp\*, (80%)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 02/24/92  
Received : 02/24/92  
Tested : 02/24/92  
Time : 1320

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.66  
Length(mm) : 44.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	10	10	10	10		100
50	0	10	10	10	10		100
25	0	0	10	10	10		100
13	0	0	1	1	1		10
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper              Lower

16.80000              25.00000      13.00000

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By : Binomial

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920103

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.4	8.4		
	O <sub>2</sub> ppm	9.9	9.4		
	Cond.	471	480		
	Temp(C)	15.5	15.0		
50	pH	8.1	8.4		
	O <sub>2</sub> ppm	9.7	9.4		
	Cond.	502	504		
	Temp(C)	15.5	15.0		
25	pH	8.0	8.4		
	O <sub>2</sub> ppm	9.6	9.4		
	Cond.	518	515		
	Temp(C)	15.5	15.0	15.5	
13	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.6		9.8	
	Cond.	524		524	
	Temp(C)	15.5	15.0	15.5	15.0
6	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.5		9.8	
	Cond.	527		529	
	Temp(C)	15.5	15.0	15.5	15.0
Control	pH	8.1		8.5	
	O <sub>2</sub> ppm	9.6		9.9	
	Cond.	529		529	
	Temp(C)	15.5	15.0	15.5	15.0

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY :

...3

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920102 Test Number: 1  
Company : Environment Canada Tire Study (3999999949)  
Region :  
Control point : New Tire B 2d post exp., (702)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J.Reid  
Date Collected : 02/24/92  
Received : 02/24/92  
Tested : 02/24/92  
Time : 1315  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.66  
Length(mm) : 44.20

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	10	10	10		100
50	0	0	1	1	2		20
25	0	0	0	0	0		0
13	0	0	0	0	0		0
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper              Lower

62.20000

100.00000

25.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920102

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4	8.5		
	O2 ppm	9.7	9.3		
	Cond.	498	502		
	Temp(C)	15.5	15.0	15.5	
50	pH	8.1		8.5	
	O2 ppm	9.4		9.8	
	Cond.	512		518	
	Temp(C)	15.5	15.0	15.5	15.0
25	pH	8.0		8.4	
	O2 ppm	9.4		9.6	
	Cond.	521		527	
	Temp(C)	15.5	15.0	15.5	15.0
13	pH	8.0		8.4	
	O2 ppm	9.5		9.7	
	Cond.	523		529	
	Temp(C)	15.5	15.0	15.5	15.0
6	pH	8.0		8.4	
	O2 ppm	9.5		9.7	
	Cond.	524		530	
	Temp(C)	15.5	15.0	15.5	15.0
Control	pH	7.9		8.4	
	O2 ppm	9.5		9.6	
	Cond.	528		534	
	Temp(C)	15.5	15.0	15.5	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## **APPENDIX 4c**

**4 day post exposure**  
• Rainbow trout

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920107 Test Number: 1

Company : Environment Canada Tire Study (399999949)

Region :

Control point : Control B 4d post exp., (504)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J.Reid

Date Collected : 02/26/92

Received : 02/26/92

Tested : ~~02/24/92~~ 02/26/92

Time : 1310

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.68

Length(mm) : 44.10

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

TOXICITY TEST PARAMETERS

Sample Number: 03920107

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.3	
	O <sub>2</sub> ppm	10.0		9.1	
	Cond.	423		429	
	Temp(C)	16.0	15.5	15.0	15.0
100	pH	8.4		8.5	
	O <sub>2</sub> ppm	9.9		9.8	
	Cond.	423		427	
	Temp(C)	16.0	15.5	15.0	15.0
Control	pH	7.8		8.5	
	O <sub>2</sub> ppm	9.5		9.3	
	Cond.	520		519	
	Temp(C)	16.0	15.5	15.0	15.0
Control	pH	7.8		8.4	
	O <sub>2</sub> ppm	9.5		9.2	
	Cond.	521		518	
	Temp(C)	16.0	15.5	15.0	15.0

B.A.R. ENVIRONMENTAL

TEST CONDUCTED BY : \_\_\_\_\_

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920105 Test Number: 1

Company : Environment Canada Tire Study (3999999949)

Region :

Control point : Scrap Tire B 4d post exp., (804)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J.Reid

Date Collected : 02/26/92

Received : 02/26/92

Tested : ~~02/24/92~~ 02/26/92

Time : 1300

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.68

Length(mm) : 44.10

MORTALITY DATA

TEST CONC.	%	E L A P S E D T I M E					TOTAL MORTALITY %
		00:00	24:00	48:00	72:00	96:00	
100	0	10	10	10	10		100
50	0	10	10	10	10		100
25	0	0	10	10	10		100
13	0	0	0	0	0		0
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

18.00000      25.00000      13.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920105

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5	8.5		
	O2 ppm	10.1	9.2		
	Cond.	447	456		
	Temp(C)	16.0	15.0		
50	pH	8.2	8.5		
	O2 ppm	10.0	9.1		
	Cond.	487	487		
	Temp(C)	16.0	15.0		
25	pH	8.0	8.3		
	O2 ppm	9.8	9.5		
	Cond.	507	513		
	Temp(C)	16.0	15.0	15.0	
13	pH	7.9		8.5	
	O2 ppm	9.7		9.0	
	Cond.	516		509	
	Temp(C)	16.0	15.0	15.0	15.0
6	pH	7.9		8.5	
	O2 ppm	9.7		9.4	
	Cond.	520		512	
	Temp(C)	16.0	15.0	15.0	15.0
Control	pH	7.9		8.5	
	O2 ppm	9.7		9.6	
	Cond.	523		513	
	Temp(C)	16.0	15.0	15.0	15.0

TEST CONDUCTED BY : \_\_\_\_\_

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920106 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
           , ONT

Region :

Control point : New Tire B 4d post exp\*, (704)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : -02/23/92 02/26/92

Received : -02/23/92 02/26/92

Tested : -02/23/92 02/26/92

Time : 1305

Type of Bioassay : STATIC  
                        (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.68

Length(mm) : 44.07

MORTALITY DATA

TEST CONC.	E L A P S E D    T I M E						TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00	
100	0	0	5	5	6	6	60
50	0	0	1	1	2	2	20
25	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper              Lower

84.70000

0.00000      0.00000  
Confidence limits > 25

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By : Binomial

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920106

Test Number: 1

TEST CONC. %		E L A P S E D T I M E					
		00:00	24:00	48:00	72:00	96:00	12:00

100	pH	8.4	8.5	8.5	8.5		
	O <sub>2</sub> ppm	10.1	9.7	9.7	10.0		
	Cond.	488	499	499	494		
	Temp(C)	16.0	15.5	15.0	15.0	15.0	15.0
50	pH	8.2				8.5	
	O <sub>2</sub> ppm	9.9				9.5	
	Cond.	507				512	
	Temp(C)	16.0	15.5	15.0	15.0	15.0	15.0
25	pH	8.0				8.4	
	O <sub>2</sub> ppm	9.8				9.7	
	Cond.	516				516	
	Temp(C)	16.0	15.5	15.0	15.0	15.0	15.0
13	pH	7.9				8.5	
	O <sub>2</sub> ppm	9.8				9.5	
	Cond.	518				519	
	Temp(C)	16.0	15.5	15.0	15.0	15.0	15.0
6	pH	8.0				8.3	
	O <sub>2</sub> ppm	9.9				9.0	
	Cond.	520				521	
	Temp(C)	16.0	15.5	15.0	15.0	15.0	15.0
Control	pH	7.9				8.3	
	O <sub>2</sub> ppm	9.8				8.9	
	Cond.	522				522	
	Temp(C)	16.0	15.5	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## **APPENDIX 4d**

**8 day post exposure**  
● Rainbow trout

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920118

Test Number: 1

Company : Environment Canada Tire Study (399999949)  
, ONT

Region :

Control point : Control B 8d post exp\*, (508)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/01/92

Received : 03/01/92

Tested : 03/01/92

Time : 1130

Type of Bioassay : STATIC

(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.87

Length(mm) : 44.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920118

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5		8.4	
	O2 ppm	10.1		10.0	
	Cond.	403		415	
	Temp(C)	15.5	15.0	15.0	15.0
100	pH	8.5		8.3	
	O2 ppm	10.1		9.6	
	Cond.	403		414	
	Temp(C)	15.5	15.0	15.0	15.0
Control	pH	7.9		8.5	
	O2 ppm	9.2		9.8	
	Cond.	523		523	
	Temp(C)	15.5	15.0	15.0	15.0
Control	pH	7.9		8.5	
	O2 ppm	9.2		9.9	
	Cond.	523		525	
	Temp(C)	15.5	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

TOXICITY TEST REPORT

## TEST CONDITIONS

Sample Number: 03920120

Test Number: 1

Company : Environment Canada Tire Study (399999949)  
          , GNT

Region :

Control point : Scrap Tire B &d post exp, (808)

Laboratory : BAR

Sampling Method : Grab

Sampled By : J. Reid

Date Collected : 03/01/92

Received : 03/01/92

Received : 03/01/92

Time : 1150

TIME : 1150

### Type of Bioassay

(FIGO effluvium)

effidencies to fish. CME, 1983).

Test Animal : Rainbow trout

Test Animal : Rainbow trout

Weight(gm) : 0.87

Length (mm) : 44.00

#### MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	10	10	10	10	100
50	0	5	10	10	10	100
25	0	0	5	5	5	50
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits

25.00000

50.00000

13.00000

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By : Binomial

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920120

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5	8.5		
	O2 ppm	9.9	9.6		
	Cond.	406	410		
	Temp(C)	15.5	15.0		
50	pH	8.2	8.5		
	O2 ppm	9.6	9.6		
	Cond.	461	467		
	Temp(C)	15.5	15.0		
25	pH	8.0	8.4		
	O2 ppm	9.3	9.5		
	Cond.	494	499		
	Temp(C)	15.5	15.0	15.0	15.0
13	pH	7.9		8.5	
	O2 ppm	9.2		9.9	
	Cond.	510		509	
	Temp(C)	15.5	15.0	15.0	15.0
6	pH	7.9		8.5	
	O2 ppm	9.3		10.1	
	Cond.	516		512	
	Temp(C)	15.5	15.0	15.0	15.0
Control	pH	8.0		8.5	
	O2 ppm	9.3		9.9	
	Cond.	519		525	
	Temp(C)	15.5	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920119 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : New Tire B 8d post exp\*, (708)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : J. Reid  
Date Collected : 03/01/92  
Received : 03/01/92  
Tested : 03/01/92  
Time : 1135

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquia effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.87  
Length(mm) : 44.00

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	6	10	10		100
50	0	0	0	1	1		10
25	0	0	0	0	0		0
13	0	0	0	0	0		0
6	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

65.73000      100.00000      50.00000

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By : Binomial

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TOXICITY TEST PARAMETERS

Sample Number: 03920119

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.5	8.5		
	O <sub>2</sub> ppm	10.1	9.7		
	Cond.	446	451		
	Temp(C)	15.0	15.0	15.0	15.0
50	pH	8.1		8.4	
	O <sub>2</sub> ppm	9.5		9.7	
	Cond.	486		492	
	Temp(C)	15.0	15.0	15.0	15.0
25	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.4		9.8	
	Cond.	506		506	
	Temp(C)	15.0	15.0	15.0	15.0
13	pH	8.0		8.4	
	O <sub>2</sub> ppm	9.3		9.8	
	Cond.	510		513	
	Temp(C)	15.0	15.0	15.0	15.0
6	pH	8.0		8.5	
	O <sub>2</sub> ppm	9.4		10.0	
	Cond.	520		518	
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.9		8.5	
	O <sub>2</sub> ppm	9.3		9.8	
	Cond.	521		523	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## **APPENDIX 4e**

**16 day post exposure**  
• Rainbow trout

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920135 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
Region : , ONT

Control point : Control B 16d post exp\*, (516)

Laboratory : BAR  
Sampling Method : Grab  
Sampled By : D.VanDenKieboom  
Date Collected : 03/09/92  
Received : 03/09/92  
Tested : 03/09/92  
Time : 1355

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) : 0.89  
Length(mm) : 48.60

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
------------	-----------------------	--	--	--	--	-----------------

%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920135

Test Number: 1

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00

100	pH	8.5		8.4	
	O <sub>2</sub> ppm	10.1		9.9	
	Cond.	401		401	
	Temp(C)	16.0	15.5	14.5	15.0

100	pH	8.5		8.4	
	O <sub>2</sub> ppm	10.1		9.9	
	Cond.	401		401	
	Temp(C)	16.0	15.5	14.5	15.0

Control	pH	7.9		8.4	
	O <sub>2</sub> ppm	9.1		9.2	
	Cond.	526		524	
	Temp(C)	16.0	15.5	14.5	15.0

Control	pH	7.9		8.4	
	O <sub>2</sub> ppm	9.1		9.2	
	Cond.	526		524	
	Temp(C)	16.0	15.5	14.5	15.0

TEST CONDUCTED BY : **B.A.R. ENVIRONMENTAL**

## TOXICITY TEST REPORT

### TEST CONDITIONS

Sample Number: 03920137 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
          , ONT

Region :

Control point : Scrap Tire B 16d post exp, (816)

Laboratory : BAR

Sampling Method : Grab

Sampled By : D.VanDenKieboom

Date Collected : 03/09/92

Received : 03/09/92

Tested : 03/09/92

Time : 1405

Type of Bioassay : STATIC  
                      (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.89

Length(mm) : 48.60

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	4	10	10	10	100
50	0	0	4	7	7	70
25	0	0	1	1	1	10
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

### 96 Hour LC50

95 % Confidence Limits

40.50000

53.71000 30.67000

SLOPE of Mortality Curve : 6.4  
LC50 Calculated By : Probit

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920137

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E  
00:00 24:00 48:00 72:00 96:00

100	pH	8.5	8.2		
	O2 ppm	10.2	9.0		
	Cond.	396	401		
	Temp(C)	16.0	15.5	14.5	
50	pH	8.2	8.4	8.5	
	O2 ppm	9.8	9.4	10.1	
	Cond.	457	455	463	
	Temp(C)	16.0	15.5	14.5	15.0
25	pH	8.0		8.4	
	O2 ppm	9.8		9.7	
	Cond.	491		492	
	Temp(C)	16.0	15.5	14.5	15.0
13	pH	8.0		8.4	
	O2 ppm	9.7		9.4	
	Cond.	505		508	
	Temp(C)	16.0	15.5	14.5	15.0
6	pH	8.0		8.5	
	O2 ppm	9.6		9.6	
	Cond.	513		513	
	Temp(C)	16.0	15.5	14.5	15.0
Control	pH	7.9		8.4	
	O2 ppm	9.5		9.7	
	Cond.	525		520	
	Temp(C)	16.0	15.5	14.5	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920136 Test Number: 1

Company : Environment Canada Tire Study (399999949)  
           , ONT

Region :

Control point : New Tire B 16d post exp\*, (716)

Laboratory : BAR

Sampling Method : Grab

Sampled By : D.VanDenKieboom

Date Collected : 03/09/92

Received : 03/09/92

Tested : 03/09/92

Time : 1400

Type of Bioassay : STATIC  
                     (Protocol to determine the acute lethality of liquia effluents to fish. OME, 1983).

Test Animal : Rainbow trout

Weight(gm) : 0.89

Length(mm) : 48.60

MORTALITY DATA

TEST CONC.	E L A P S E D    T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	
100	0	0	1	1	1	10
50	0	0	0	0	0	0
25	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	1	10
Control	0	0	0	0	1	10

96 Hour LC50

95 % Confidence Limits  
Upper            Lower

&gt;100            0.00000        0.00000

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By : Binomial

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TOXICITY TEST PARAMETERS

Sample Number: 03920136

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.5		8.4	
	O2 ppm	9.8		10.0	
	Cond.	419		423	
	Temp(C)	16.0	15.5	14.5	15.0
50	pH	8.2		8.4	
	O2 ppm	9.7		9.8	
	Cond.	466		476	
	Temp(C)	16.0	15.5	14.5	15.0
25	pH	8.1		8.3	
	O2 ppm	9.6		9.3	
	Cond.	494		501	
	Temp(C)	16.0	15.5	14.5	15.0
13	pH	8.0		8.3	
	O2 ppm	9.6		8.8	
	Cond.	507		509	
	Temp(C)	16.0	15.5	14.5	15.0
6	pH	8.0		8.4	
	O2 ppm	9.3		9.2	
	Cond.	515		516	
	Temp(C)	16.0	15.5	14.5	15.0
Control	pH	7.9		8.5	
	O2 ppm	9.1		9.6	
	Cond.	516		516	
	Temp(C)	16.0	15.5	14.5	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## **APPENDIX 4f**

**32 day post exposure**  
• Rainbow trout

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920171 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Control B 32d post exp., (532)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K.Holtze  
Date Collected : 03/25/92  
Received : 03/27/92  
Tested : 03/27/92  
Time : 1130  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.39  
Length(mm) : 37.60

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

Page 2

TOXICITY TEST PARAMETERS

Sample Number: 03920171

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

---

100	pH	8.5		8.4	
	O <sub>2</sub> ppm	10.0		9.9	
	Cond.	395		390	
	Temp(C)	15.0	15.0	15.0	15.0

Control	pH	7.9		8.4	
	O <sub>2</sub> ppm	9.2		9.5	
	Cond.	525		519	
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY : B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920173 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : Scrap Tire B 32d post exp, (832)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K.Holtze  
Date Collected : 03/25/92  
Received : 03/27/92  
Tested : 03/27/92  
Time : 1130  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.39  
Length(mm) : 37.60

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	6	9	10	10		100
50	0	0	5	10	10		100
25	0	0	0	0	0		0
13	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

35.40000

50.00000      25.00000

TOXICITY TEST PARAMETERS

Sample Number: 03920173

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4	8.4	8.5	
	O2 ppm	9.3	9.2	10.0	
	Cond.	390	386	388	
	Temp(C)	15.0	15.0	15.0	15.0
50	pH	8.1		8.3	
	O2 ppm	9.7		9.5	
	Cond.	462		457	
	Temp(C)	15.0	15.0	15.0	15.0
25	pH	8.0			8.3
	O2 ppm	9.2			9.4
	Cond.	495			498
	Temp(C)	15.0	15.0	15.0	15.0
13	pH	8.0			8.3
	O2 ppm	8.9			9.4
	Cond.	511			508
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.9			8.4
	O2 ppm	9.2			9.5
	Cond.	525			519
	Temp(C)	15.0	15.0	15.0	15.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL

## TOXICITY TEST REPORT

TEST CONDITIONS

Sample Number: 03920172 Test Number: 1  
Company : Environment Canada Tire Study (399999949)  
Region :  
Control point : New Tire B 32d post exp., (732)  
Laboratory : BAR  
Sampling Method : Grab  
Sampled By : K.Holtze  
Date Collected : 03/25/92  
Received : 03/27/92  
Tested : 03/27/92  
Time : 1130  
Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) : 0.39  
Length(mm) : 37.60

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
	%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50

95 % Confidence Limits  
Upper      Lower

Non-lethal

SLOPE of Mortality Curve : 0.0  
LC50 Calculated By :

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TOXICITY TEST PARAMETERS

Sample Number: 03920172

Test Number: 1

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4		8.4
	O <sub>2</sub> ppm	9.9		10.1
	Cond.	401		393
	Temp(C)	15.0	15.0	15.0

Control	pH	7.9		8.4
	O <sub>2</sub> ppm	9.2		9.5
	Cond.	525		519
	Temp(C)	15.0	15.0	15.0

TEST CONDUCTED BY :

B.A.R. ENVIRONMENTAL



Environment  
Canada

Environnement  
Canada

Conservation and  
Protection

Conservation et  
Protection

National Water Research Institute  
867 Lakeshore Road, P.O. Box 5050  
Burlington, Ontario  
L7R 4A6



CANADA'S GREEN PLAN  
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Your file    Votre référence

Our file    Notre référence

August 31, 1992

**Library**

National Water Research Institute  
Canada Centre for Inland Waters

Library Staff,

I am pleased to send you a copy of the final contractor report prepared for NWRI by B.A.R. Environmental Inc. titled "Evaluation of the Potential Toxicity of Automobile Tires in the Aquatic Environment". Work on this study is continuing at NWRI, especially on the chemistry side in attempting to identify the toxic components of the tire leachate. Until these and other chemistry tests are further advanced and the effects of dilution, transport and fate of the toxic components are better understood, I am still optimistic about the use of waste tires in water. In fact, an artificial tire reef has been approved by provincial regulatory agencies and will be installed this month in Lake Erie's Long Point Bay.

Some of you may be interested to know that a study similar to our's, but with saltwater, is being undertaken by the Maryland Department of Natural Resources; it is related to the proposed use of tires for aquacultural activities in Chesapeake Bay.

Please call me at (416) 336-4886 or FAX 336-4989 if you would like to discuss this work.

Yours truly,

Craig Bishop  
Hydraulics Project  
Research and Applications Branch

Encl:

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