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Environmental Protection Service
Rm #200, 4999-98 Avenue
Edmonton, Alberta, T6B 2X3

File No: 4808-13

July 14, 1998

Pauline Baker
Manager, Customer Relations
Sphagsorb International Sales
13810 170th Street
Edmonton AB T5V 1T2

Dear Ms. Baker,

Thank-you for providing a peat moss product for use during the development of our guidelines for evaluating the toxicity of sorbents. I have appended descriptions of the toxicity tests performed using your product and the results. In brief, the product was non-toxic to rainbow trout at 10 g/L. I have also appended a summary of toxicity test recommendations for sorbents developed as a result of this project. If you have any questions please do not hesitate to contact me.

Sincerely,

Sandra Blenkinsopp, Ph.D.
Environmental Scientist

cc Gary Sergy
Merv Fingas, Chief, Emergencies Science Division



Toxicity Test Results on the Peat Moss Product received from Pauline Baker

Rainbow Trout Testing

Rainbow trout were purchased from Rainbow Springs Hatchery in London, Ontario. Fish were shipped to Moncton, New Brunswick and acclimated at the facility to a temperature of 15°C. The fish were maintained at 15 ± 2°C for a minimum of 2 weeks prior to use in testing. A reference toxicant, phenol, was tested once a calendar month for each batch of fish used in these tests. The LC50 value was entered into the control chart to ensure the test was within normal operating conditions.

The loose peat moss product was used to help us determine appropriate soaking times for sorbents. The appropriate volume of control/dilution water (soft, dechlorinated municipal) was added to the test vessel. Test concentrations were made by weighing the required amount of product (10 g/L), adding it to the appropriate tanks, and soaking for 1 or 24 hours. The product was then removed by netting with a small fish net and squeezing to return most of the liquid to the test chamber. The product was also tested after a 1 hour soak with the product left in the test vessel during the test.

Prior to test organism introduction, the test solutions were pre-aerated for 30 minutes at 6.5 ± 1 mL air/minute/L solution. Rainbow trout acute lethality tests (freshwater) were conducted on the resultant solutions according to EPS 1/RM/9 (Environment Canada, 1990). For pre-tests one concentration (10 g/L) and a control were used for each sorbent test. Any sorbent found to be toxic at 10 g/L was retested as a multi-concentration test with 5 concentrations and a control. After the 30 minute pre-aeration the solutions were checked for temperature, dissolved oxygen, pH, salinity and conductivity. Fish were then introduced into each test container in a random order. The test continued for 96 hours with checks of fish behaviour or mortality, temperature, pH and dissolved oxygen at 24, 48, 72 and 96 hours as a minimum. At the end of 96 hours the test was terminated. The control fish were measured for length and weight and loading density was determined.

For single concentration tests the percent mortality in the test and control fish were calculated. For multi-concentration tests, an LC50 was calculated using the Toxstat Version 3.5 statistical program. The LC50 is an estimate of the concentration in which half of the test organisms die. The LC50 is quoted with 95% confidence limits.

Results

This product was tested after a 1 and 24 hour soak, after which time the peat material was removed by netting. This product was also tested after a 1 hour soak and the product left in the vessel during the test. No mortalities were observed in any of these tests during the 96 hour test period, therefore this product was non-toxic to rainbow trout at 10 g/L. This peat moss product depressed the pH of the test solutions to below pH 5 units even after the 1 hour soak, while the pH of the control water remained at 7 pH units.

All reference toxicants were within warning limits. All tests had ≤10% mortality of the fish in the control populations.