

MEMORANDUM

March 26, 1975

To: Mark Premo

From: Lew Kittle, Aquatic Biologist

Subject: Bioassay on Mason Creek

The 96-hour static bioassay you requested was conducted from 1400 on 3/20/75 to 1400 on 3/24/75 using the undiluted sample water. It was conducted using the methods and procedures described in Standard Methods 1971 (562-77) for static bioassays.

Fall Chinook (*O. tschawytscha*) from George Adams Hatchery were used as test organisms. They averaged 0.9 gm/fish in weight with a mean length of 43.5 mm. The longest was 47 mm and the shortest was 41 mm (length ratio 1: 1.15, Standard Methods).

Each test tank contained eight (8) liters of sample water and nine (9) fish giving a flesh to water ratio of 1.02 gms/Liter (ASTM). The control had 33 fish in 30 Liters of tap water.

The results were as follows:

Mason Creek above Cedar Hills Sanitary Landfill  
Leachate Stream

| Date  | Temp (C°) | D.O. (ppm) | pH  | Mortalities |
|-------|-----------|------------|-----|-------------|
| 3/20  | 10.2      | 10.0       | 6.7 | 0           |
| 3/21  | 10.0      | 11.0       | 7.4 | 0           |
| 3/22  | 9.6       | 9.0        | 7.0 | 0           |
| 3/23  | 9.5       | 9.0        | 7.3 | 0           |
| 3/24  | 9.9       | 12.0       | 7.2 | 0           |
| Total |           |            |     | 0           |

% mortalities = 0

Mason Creek below Cedar Hills Sanitary Landfill  
Leachate Stream

| Date | Temp(C°) | D.O.(ppm) | pH    | Mortalities |
|------|----------|-----------|-------|-------------|
| 3/20 | 10.2     | 9.0       | 6.8   | 0           |
| 3/21 | 10.0     | 11.0      | 6.9   | 0           |
| 3/22 | 9.6      | 9.0       | 7.2   | 1           |
| 3/23 | 9.5      | 10.0      | 7.0   | 2           |
| 3/24 | 9.9      | 12.0      | 7.0   | 2           |
|      |          |           | Total | 5           |

% mortalities = 56

Control

| Date | Temp(C°) | D.O.(ppm) | pH    | Mortalities |
|------|----------|-----------|-------|-------------|
| 3/20 | 10.2     | 9.0       | 7.2   | 0           |
| 3/21 | 10.0     | 11.0      | 7.4   | 0           |
| 3/22 | 9.6      | 9.0       | 7.2   | 0           |
| 3/23 | 9.5      | 9.0       | 7.2   | 0           |
| 3/24 | 9.9      | 12.0      | 7.4   | 0           |
|      |          |           | Total | 0           |

% mortalities = 0

The mortalities in the sample from below the leachate stream were probably caused by the synergistic effect of the dissolved heavy metals (Ashley, memo, Water Quality Criteria, 1963). Individually the heavy metals were below the toxicity limits established in Water Quality Criteria, but in combination with all the various components of Mason Creek the sample was toxic.

In the environment, the indigenous fish species probably avoid Mason Creek (Jones, 1957), therefore eliminating all productivity from below the confluence of the leachate stream to Issaquah Creek.

References:

- Anon, 1963, Water Quality Criteria. State Water Quality Control Board, Sacramento, California: 2nd Edition; Chapter VI.
- Anon, 1971, Standard Methods for the Examination of Water and Wastewater. American Public Health Assoc. 13th Edition; 562-77.

Page 3  
Bioassay on Mason Creek

Jones, J.R.E., 1957 Fish and River Pollution. Chapt. 7,  
Aspects of River Pollution. L. Klein.  
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cc: Merley McCall  
John Conroy