



caring about you & your environment

Report 00.797

8 November 2000

File: K/9/2/3

[Report 2000.Env00797.KH:mm]

Report to Environment Committee
from Kathryn Hooper, Resource Quality Officer

Pukerua Bay Landfill – Follow Up Surface Water Quality Investigation

1. Purpose

To inform the Committee of the results of follow up investigations undertaken at Pukerua Bay Landfill.

2. Background

During 1998/1999, two water sampling runs were undertaken at three sites around the Pukerua Bay Landfill. These sample sites were located upstream and downstream of the old landfill, and at the toe of the fill. The results of this sampling were presented in the Resource Investigations Technical Report “Investigation of Selected Closed Landfills in the Wellington Region, 1998-1999” (WRC/RINV-T-99/40).

Results from this sampling showed the following:

- Nitrogen and manganese levels downstream of the landfill exceeded ANZECC guidelines for aquatic ecosystems;
- Chromium, copper, lead and zinc levels were in excess of stock watering guidelines; and
- Iron, suspended solids and nickel levels exceeded both aquatic ecosystems and stock watering guideline levels.

Further sampling at the Pukerua Bay Landfill was recommended to determine the source of the high contaminant levels and to validate the results as only two sampling runs were undertaken.

3. Key Findings

3.1 Contaminant Levels within Guidelines

On 19 April and 31 May further samples were taken from the three sites at the landfill. The results of this sampling are shown in Table 1.

Table 1. Results of Sampling at Pukerua Bay Landfill on 19 April 2000

		Sample point			Guideline Levels	
		AR1	AR3	AR4	Stock	Aquatic
		Upstream of landfill	Downstream of landfill	Above Taupo Swamp		
Parameter	Unit					
FC	CFU/100ml	165	1	77	-	-
COD	g/m ³	35	59	18	-	-
Cond	µS/c	650	1320	391	1500	1500
Cl	g/m ³	130	130	70	-	700
pH	pH	7.2	7.4	7.4	6-9	6-9
SS	g/m ³	190	250	<2	10% incr	10% incr
Alkt	g/m ³	50	510	64	-	-
Cd	g/m ³	<0.1	<0.01	<0.01	0.0002	0.01
Cr	g/m ³	<0.05	<0.05	<0.05	0.01	1.00
Cu	g/m ³	<0.02	<0.02	<0.02	0.002	0.2
Fe	g/m ³	<u>2.7</u>	<u>22</u>	0.46	0.5	1.0
Pb	g/m ³	<0.10	<0.10	<0.10	0.001	0.2
Mn	g/m ³	0.15	0.47	0.05	-	2.0
Ni	g/m ³	<0.05	<0.05	<0.05	0.015	0.2
K	g/m ³	3.0	28	1.9	-	-
Na	g/m ³	100	110	51	-	300
Zn	g/m ³	<0.05	<0.05	<0.05	0.005	2.00

* Ammoniacal Nitrogen

Note: **Bold** denotes exceeds ANZECC Aquatic Ecosystems guideline level,
Underline denotes exceeds ANZECC Stock Watering guideline levels,
Bold/underline denotes exceeds both ANZECC Aquatic Ecosystem and Stock Watering guideline levels.

Table 2. Results of Sampling at Pukerua Bay Landfill on 31 May 2000.

		Sample point			Guideline Levels	
		AR1	AR3	AR4	Stock	Aquatic
		Upstream	Downstream of landfill	Above Taupo Swamp		
Parameter	Unit					
FC	CFU/100ml	2	500	86	-	-
COD	g/m ³	49	41	23	-	-
Cond	µS/c	642	1100	384	1500	1500
Cl	g/m ³	<0.05	115	72	-	700
pH	pH	7.5	7.4	7.3	6-9	6-9
SS	g/m ³	56	72	5	10% incr	10% incr
Alkt	g/m ³	48	410	55	-	-
Cd	g/m ³	<0.01	<0.01	<0.01	0.0002	0.01
Cr	g/m ³	<0.05	<0.05	<0.05	0.01	1.00
Cu	g/m ³	<0.02	<0.02	<0.02	0.002	0.2
Fe	g/m ³	<u>2.3</u>	<u>12</u>	0.44	0.5	1.0
Pb	g/m ³	<0.10	<0.10	<0.10	0.001	0.2
Mn	g/m ³	0.12	0.40	<0.05	-	2.0
Ni	g/m ³	<0.05	<0.05	<0.05	0.015	0.2
K	g/m ³	3.8	22	2.4	-	-
Na	g/m ³	100	95	49	-	300
Zn	g/m ³	<0.05	<0.05	<0.05	0.005	2.00

* **Ammoniacal Nitrogen**

Note: **Bold** denotes exceeds ANZECC Aquatic Ecosystems guideline level,
Underline denotes exceeds ANZECC Stock Watering guideline levels,
Bold/underline denotes exceeds both ANZECC Aquatic Ecosystem and Stock Watering guideline levels.

These results show that the only contaminant to exceed guideline levels was iron. It appears that this iron is naturally occurring in the soil as it exceeded guideline levels upstream of the fill on both occasions.

Iron levels on 19 April and 31 May were significantly less than those detected during previous sampling. There was suggestion that material from the bottom of the stream entered the sample bottle and may have contributed to the elevated levels obtained during the initial survey. Results of this follow-up investigation indicate that this was most likely the case.

3.2 Porirua City Council to Undertake Further Investigation

Porirua City Council is continuing to monitor Pukerua Bay Landfill. Four sampling sites have been established at the landfill, two upstream and two downstream. The Wellington Regional Council will be informed of progress with this sampling.

4. **Summary**

Findings of this follow up investigation indicate that the environmental impacts of leachate discharges to surface water from the Pukerua Bay Landfill are small. This investigation has also shown that the levels of contaminants entering the Taupo Swamp are not of major concern. Continued monitoring by Porirua City Council will ensure that any leachate discharges are identified and addressed where appropriate.

5. **Further Action**

The Wellington Regional Council will continue to liaise with Porirua City Council about this issue, and will be informed of the outcome of their investigations.

6. **Communication**

Copies of this report will be provided to the Queen Elizabeth Trust and the Porirua City Council. Findings of the report will also be communicated to media sources in the Region who expressed interest in this issue at the time of the initial report.

7. **Recommendations**

That the report be received and the contents noted.

Report prepared by:

Approved for submission:

KATHRYN HOOPER
Resource Quality Officer

JOHN SHERRIFF
Manager, Resource Investigations

JANE BRADBURY
Divisional Manager, Environment