

ANNEX 1 (TO COMMENTS OF 26/04/05)
AMENDED MONITORING PROGRAMME
(ORIGINALLY SECTION 7.0 OF ADDENDUM DOCUMENT SUBMITTED
WITH ADDITIONAL INFORMATION OF 16TH MARCH 2005)

Table 1: Monitoring programme for groundwater

| | |
|---|---|
| <i>FREQUENCY</i> | Quarterly |
| <i>NUMBER OF BOREHOLES</i> | 5 [Ref: Drawing – ZW008/04] |
| <i>SAMPLING PROCEDURE</i> | ISO 5667 Part II, 1993: Sampling Groundwaters |
| <i>EQUIPMENT</i> | Solinst Portable Bladder Pump |
| <i>PARAMTERS TO BE MONITORED</i> [As per requirements of the Waste Management (Landfill) Regulations 2002 and control/trigger levels derived] | Metals (As, B, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn) Ammoniacal nitrogen Chloride Fluoride Sulphate pH Conductivity Naphthalene Toluene Phenol Index Total organic carbon |

Table 1a: Details of accuracy/detection limits

| <i>Determinand</i> | <i>Accuracy / Limit of Detection</i> |
|---------------------------|---|
| As | 1 ug/l |
| Ba | 20 ug/l |
| Cd | 0.1 ug/l |
| Cr | 8 ug/l |
| Cu | 2 ug/l |
| Hg | 0.1 ug/l |
| Mo | 1 ug/l |
| Ni | 10 ug/l |
| Pb | 1 ug/l |
| Sb | 1 ug/l |
| Se | 1 ug/l |
| Zn | 5 ug/l |
| Ammoniacal nitrogen | 0.01 mg/l |
| Chloride | 0.5 mg/l |
| Fluoride | 0.5 mg/l |
| Sulphate | 0.5 mg/l |
| pH | 0.1 pH units |
| Conductivity | 0.01 mS/cm |
| Naphthalene | 1 ug/l |
| Toluene | 1 ug/l |
| Phenol Index | |
| Total organic carbon | 0.1 mg/l |

* Details of methodology will be provided within 1 month of issue of permit.

Table 2: Monitoring programme for surface water

| | |
|---|--|
| <i>FREQUENCY</i> | 3 times during the rainy season between October and March |
| <i>NUMBER OF POINTS</i> | To be provided within 1 month of issue of permit |
| <i>SAMPLING PROCEDURE</i> | To be provided within 1 month of issue of permit |
| <i>EQUIPMENT</i> | To be provided within 1 month of issue of permit |
| <i>PARAMTERS TO BE MONITORED</i> | Metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn) Ammoniacal nitrogen Chloride Fluoride Sulphate pH Conductivity Naphthalene Toluene Phenol Index Total organic carbon |

Table 2a: Details of methodology, accuracy/detection limits, assessment and compliance levels

| <i>Determinand</i> | <i>Accuracy / Limit of Detection</i> | <i>Assessment Level</i> | <i>Compliance Level</i> |
|---------------------------|---|------------------------------------|------------------------------------|
| As | 1 ug/l | 5 ug/l | 10 ug/l |
| Ba | 20 ug/l | | |
| Cd | 0.1 ug/l | 2.5 ug/l | 5.0ug/l |
| Cr | 8 ug/l | 25 ug/l | 50 ug/l |
| Cu | 2 ug/l | 1.0 mg/l | 2.0 mg/l |
| Hg | 0.1 ug/l | 0.5 ug/l | 1.0 ug/l |
| Mo | 1 ug/l | | |
| Ni | 10 ug/l | 10 ug/l | 20 ug/l |
| Pb | 1 ug/l | 5 ug/l | 10 ug/l |
| Sb | 1 ug/l | | |
| Se | 1 ug/l | 5 ug/l | 10 ug/l |
| Zn | 5 ug/l | | |
| Ammoniacal nitrogen | 0.01 mg/l | 500 ug/l | 1 mg/l |
| Chloride | 0.5 mg/l | 250 mg/l | 500 mg/l |
| Fluoride | 0.5 mg/l | | |
| Sulphate | 0.5 mg/l | 250 mg/l | 500 mg/l |
| pH | 0.1 pH units | | |
| Conductivity | 0.01 mS/cm | | |
| Naphthalene | 1 ug/l | | |
| Toluene | 1 ug/l | | |
| Phenol Index | | | |
| Total organic carbon | 0.1 mg/l | | |

* Details of methodology will be provided within 1 month of issue of permit.

Table 3: Monitoring programme for leachate

| | |
|---|---|
| <i>FREQUENCY</i> | QUARTERLY |
| <i>NUMBER OF POINTS</i> | 4 |
| <i>SAMPLING PROCEDURE</i> | Not applicable |
| <i>EQUIPMENT</i> | Not applicable |
| <i>PARAMTERS TO BE MONITORED</i> | <p>Metals (As, Ba, Cd, Cr, Cu, Hg, Mo, Ni, Pb, Sb, Se, Zn)</p> <p>Ammoniacal nitrogen</p> <p>Chloride</p> <p>Fluoride</p> <p>Sulphate</p> <p>pH</p> <p>Conductivity</p> <p>Naphthalene</p> <p>Toluene</p> <p>Phenol Index</p> <p>Total organic carbon</p> |

Table 3a: Details of methodology, accuracy/detection limits, assessment and compliance levels

| <i>Determinand</i> | <i>Accuracy / Limit of Detection</i> | <i>Assessment Level</i> | <i>Compliance Level</i> |
|---------------------------|---|------------------------------------|------------------------------------|
| As | 1 ug/l | 5 ug/l | 10 ug/l |
| Ba | 20 ug/l | | |
| Cd | 0.1 ug/l | 2.5 ug/l | 5.0ug/l |
| Cr | 8 ug/l | 25 ug/l | 50 ug/l |
| Cu | 2 ug/l | 1.0 ug/l | 2.0 mg/l |
| Hg | 0.1 ug/l | 0.5 ug/l | 1.0 ug/l |
| Mo | 1 ug/l | | |
| Ni | 10 ug/l | 10 ug/l | 20 ug/l |
| Pb | 1 ug/l | 5 ug/l | 10 ug/l |
| Sb | 1 ug/l | | |
| Se | 1 ug/l | 5 ug/l | 10 ug/l |
| Zn | 5 ug/l | | |
| Ammoniacal nitrogen | 0.01 mg/l | 500 ug/l | 1 mg/l |
| Chloride | 0.5 mg/l | 250 mg/l | 500 mg/l |
| Fluoride | 0.5 mg/l | | |
| Sulphate | 0.5 mg/l | 250 mg/l | 500 mg/l |
| pH | 0.1 pH units | | |
| Conductivity | 0.01 mS/cm | | |
| Naphthalene | 1 ug/l | | |
| Toluene | 1 ug/l | | |
| Phenol Index | | | |
| Total organic carbon | 0.1 mg/l | | |

* Details of methodology will be provided within 1 month of issue of permit.

Table 4: Monitoring programme for landfill gas

| | |
|---|--|
| <i>FREQUENCY</i> | Weekly |
| <i>NUMBER OF LOCATIONS</i> | 11 [Ref: Drawing ZW014/04] |
| <i>SAMPLING PROCEDURE</i> | Not applicable |
| <i>EQUIPMENT</i> | GA 94 hand held landfill gas monitor |
| <i>PARAMTERS TO BE MONITORED</i> | Methane Carbon monoxide Hydrogen sulphide Carbon dioxide Oxygen Pressure Temperature |

| | <i>Trigger Level</i> | <i>Control Level</i> |
|--|-----------------------------|-----------------------------|
| <i>Methane</i> | <i>2.5%</i> | <i>5%</i> |
| * Control and trigger levels for other parameters may be pre-set in the monitoring instrument. | | |

Table 5: Monitoring programme for ambient air quality

| | |
|---|---|
| <i>FREQUENCY</i> | Monthly |
| <i>NUMBER OF LOCATIONS</i> | 1 |
| <i>SAMPLING PROCEDURE</i> | <p>Compendium method TO-9A (US EPA) & Scott Wilson Study</p> <p>High volume sampler to be operated continuously over a 7-day period. Quartz microfibre filter to be changed daily and weighed to calculate daily average concentrations of total suspended particles (TSP) in air. PUF plug to be left in the sampling unit for the whole 7-day period.</p> |
| <i>EQUIPMENT</i> | Pacwill Environmental TE-1000 Poly Urethane Foam Sampler |
| <i>PARAMTERS TO BE MONITORED</i> | <p>PUF plug + quartz microfibre filters:</p> <ul style="list-style-type: none"> • Dioxins [PCCD/Fs as both speciated and EC/NATO/CCMS/I-TEQ concentrations] • PAHs [naphthalene, acenaphthylene, fluorine, phenanthrene, anthracene, fluoranthene, pyrene, benza(a)anthracene, chrysene, benzo(b/k)fluoranthene, benzo(a)pyrene, indeno(123cd)pyrene, dibenzo(ah)anthracene, benzo(ghi)perylene] <p>quartz micro-fibre filters: Heavy metals [As, Cd, Co, Cr, Cu, Hg, Mn, Pb, Ni, Sb, Se, Sn, Th, V].</p> |

* No trigger and control levels have been set.