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**Table 1:** Constituents Not on Appendices VII, VIII, or IX

| CAS # | CONSTITUENT | Wastewater | Nonwastewater | |
|---|---|---|---|---|
| | | | TOTALS | LEACH |
| 75-07-0 | Acetaldehyde (ethanal) | | | |
| 98-82-8 | Cumene | .67 | 18,000 | 2.5 |
| 124-40-3 | Dimethylamine | | | |
| 110-00-9 | Furan | .16 | 1300 | .06 |
| 79-10-7 | Acrylic acid | No exit levels because no EQC is available for this constituent. The criteria for exit would be to meet LDR treatment standards in Section 268. | | |
| 98-01-1 | 2-Furancarboxaldehyde (furfural) | | | |

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Table 2: Modeled Constituents Without EQCs

| CASNUM | Constituent | NWW TOTALS | NWW LEACH | WW TOTALS |
|---|---|---|---|---|
| 96-45-7 | Ethylene thiourea | 0.51 | 0.00017 | .00053 |
| 62-38-4 | Phenyl mercuric acetate | 0.0093 | 0.0045 | 0.012 |

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Table 3. EPACMTP Modeling Options

| | |
|---|---|
| **Management Scenarios:** | Industrial Subtitle D:<br>i) Landfill<br>ii) Surface Impoundment<br>iii) Waste Pile<br>iv) Land Application Unit |
| **Modeling Scenario:** | Finite Source Monte Carlo; |
| **Regulatory Protection Level:** | 90% (yields an approximate DAF of 10 for a continuous source landfill) |
| **Source Parameters:** | |
| Waste Unit Area: | Site based, form OSW Industrial Subtitle D Survey |
| Waste Unit Volume: | Site based, from OSW Industrial Subtitle D Survey |
| Infiltration Rate: | |
| Landfill: | Site-based, derived from water balance using HELP model |
| Surface Impoundment: | Site-based, derived from impoundment depth using Darcy's law |
| Waste Pile: | Site-based derived from water balance using HELP model |
| Land Application Unit | Site-based, derived from water balance using HELP model |
| Leaching Duration: | |
| Landfill | Derived, continues until all constituent has leached out |
| Surface Impoundment | 20 years (operational life of waste unit) |
| Waste Pile | 20 years (operational life of waste unit) |
| Land Application Unit | 40 years |
| **Chemical Specific Parameters:** | |
| Decay Rate: | |
| Organics | Hydrolysis rates based on measurements or based on appropriate structure-activity relationships |
| Metals | No decay |

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| | |
|---|---|
| Sorption: | |
| Organics: | $K_{oc}$ estimated from $K_{ow}$, which is based on measurements or based on appropriate structure-activity relationships |
| Metals: | MINTEQ sorption isotherms (Pb, Hg, Ni, Cr (III), Ba, Cd)<br>pH dependent isotherms (As, Cr (VI), Se (VI), Th) |

**Unsaturated Zone Parameters:**

| | |
|---|---|
| Depth to groundwater: | Site-based, from API/USGS hydrogeologic database |
| Soil Hydraulic Parameters: | National distribution for the main soil types |
| Fraction Organic Carbon: | National distribution for the main soil types |
| Bulk Density: | National distribution for the main soil types |

**Saturated Zone Parameters:**

| | |
|---|---|
| Recharge Rate: | Site-based, derived from precipitation/evaporation and soil type |
| Saturated Thickness: | Site-based, from API/USGS hydrogeologic database |
| Hydraulic Conductivity: | Site-based, from API/USGS hydrogeologic database |
| Porosity: | Effective porosity derived from national distribution of aquifer particle diameter |
| Bulk Density: | Derived from porosity |
| Dispersivity: | Derived from a national distribution and is based on distance to the receptor well |
| Groundwater Temperature: | Site-based, from USGS regional temperature map |
| Fraction Organic Carbon: | National distribution, from EPA STORET database |
| pH | National distribution, from EPA STORET database |

**Receptor Well Location:**

| | |
|---|---|
| Radial Distance: | Nationwide distribution based the survey |
| Angle Off-Center: | Uniform within ± 90° from plume centerline (no restriction to be within plume) |
| Depth of Intake Point: | Uniform throughout saturated thickness of aquifer |

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Table 4 Effect of 1,000 year versus 10,000 year modeling time horizon on leachate concentration limit

| $k_{oc}$ ($cm^3/g$) | 10,000 years | 1,000 years |
|---|---|---|
| 0.0 | 1.0 | 1.0 |
| 3,384 (R=10) | 1.0 | 1.2 |
| 37,224 (R=100) | 1.0 | 60 |

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**Table 5 Aggregate effect of modeling alternatives on leachate concentration limits for non-degrading, non-sorbing constituents for four waste management scenarios**

| Waste Management Scenario | HWIR proposal | Alternative Options |
|---|---|---|
| Landfill | 1.0 | 0.71 |
| Surface Impoundment | 0.22 | 0.27 |
| Waste Pile | 0.29 | 484 |
| Land Application Unit | 0.08 | 0.22 |

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