

Appendix F: Calculations of Methane Partitioning from Water to Gas Phase.

Henry's Law	$Ca = Kh Cw$
Ca =	Gas-Phase Concentration (mg l ⁻¹)
Cw =	Water-Phase Concentration (mg l ⁻¹)
Kh =	Henry's Law Constant (dimensionless)
	For Methane, Kh = 29*

Calculator:	Concentration of Methane in Groundwater	Units
Cw (Leachate) =	6.98	mg l ⁻¹
Cw (GW On-Site) =	7.93	mg l ⁻¹
Cw (GW Off-Site) =	0.899	mg l ⁻¹
Cw (Solubility Limit)**	35	mg l ⁻¹
Kh =	29	dimensionless
Gas-Phase Concentration		
Ca (Leachate) =	202.42	mg l ⁻¹
Ca (GW On-Site) =	229.97	mg l ⁻¹
Ca (GW Off-Site) =	26.071	mg l ⁻¹
Ca (Solubility Limit) =	1015	mg l ⁻¹

Percentage Concentration in Air	
Ca (Leachate) =	0.020242
Ca (GW On-Site) =	0.022997
Ca (GW Off-Site) =	0.002607
Ca (Solubility Limit) =	0.101500

References:

*Kjeldsen, P. (1996), Landfill Gas Migration in Soil. In *Landfilling of Waste: Biogas* (Eds. Christensen, T.H, Cossu, R. & Stegmann, R.), E & FN Spon, London, P.114, Table 5.

**Solubility Limit is 35 mg/L in water at 20°C (Ref: *The Physical and Theoretical Chemistry Laboratory, Oxford University, UK:Chemical and Other Safety Information*).<http://msds.chem.ox.ac.uk>