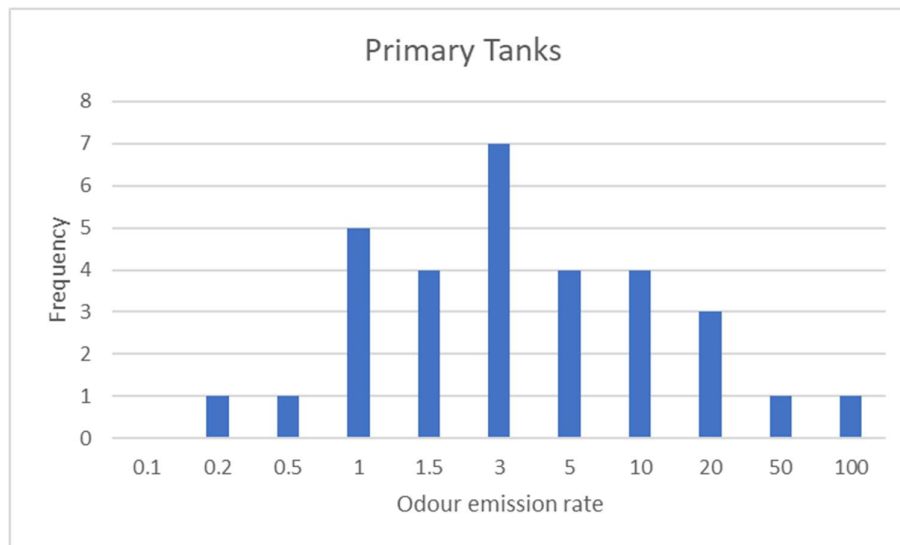


Selection of Odour Emission Rates for WWTWs

The MBAL database now has a facility to allow a user to select the median and a user selected percentile odour emission rate for most WWTW processes. This is based on the emission rates detailed in the database. There is a wide range in reported odour emission rates for many WWTW works, for instance, the odour emission rate values in the database (as of March 2023) for Primary Sedimentation tanks are shown below:



As can be seen, the values have a range of nearly four orders of magnitude. Therefore, when selecting an representative odour emission rate, some judgement is required and it is important to consider the potential variation in sensitivity tests where modelling is carried out.

The variation in odour emission rates can often arise as a result of the condition in which sewage arrives at the works. Where the sewage takes some time to reach the works, septic conditions may arise and hence it will be more odorous on arrival. A judgement can be made of the likelihood of septic conditions based on the size of the sewerage network serving the works, these are often detailed in Catchment and Drainage Management plans. The size of works is also important, a small works is less likely too be highly odorous as the area served is small and there is less opportunity for sewage to arrive in a septic condition. Works may also does the incoming sewage either before on arrival to remove hydrogen sulphide and reduce odours. A site visit and sniff testing near to the inlet works can also be helpful to identify if septic conditions exist at a particular works.

Sewage stored at pumping stations may also become septic and that may increase odour emission rates.

Therefore, while median odour emission rates may be an obvious choice as a starting point in an assessment, the user may wish to select values from the database that might represent the site be more representative of the size and nature of the site being assessed.

Where a median value is selected, MBAL would recommend that a sensitivity test is carried out using a higher percentile value (we generally use the 70th percentile). If this results in odour concentrations that are still within the selected target value, you can be more confident in your predicted outcome. You can go further and look at higher percentile values and demonstrate that there is only a very small chance of a potential exceedance of the selected standard.

One commonly quoted alternative source of odour emission rates for WWTWs are the UKWIR¹ values. The UKWIR document provides odour emission rates for some WWTW processes based on modelling for Low, Typical, High and Very High odour emission rate works.

The table below compares the odour emission rates from the UKWIR document with those from the MBAL database, for comparison the 25th, 50th, 75th and 100th percentile values have been selected from the database.

UKWIR	Screen	PST	ASP	ASP2	FST	Database percentile	Screen	PST	ASP	FST
Low	20	0.8	2	5	0.3	25	20.5	1.6	4.75	0.5
Typical	50	1.9	4	10	0.7	50	50	3.9	1.4	0.7
High	200	7.5	10	25	1.7	75	105	11	2.86	1
Very High	2000	76	40	100	3.4	100	186	54.1	27	4.5

This shows many of the values are often very comparable but there are two significant differences. The Very High values in the UKWIR database are not observed in practice (apart from for FST) and the values for activated sludge process (ASP) are much higher in the UKWIR document. There are two sets of values for ASPs in the UKWIR database which are not explained, however, both are higher than observed values.

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¹ UKWIR (2001) Odour Control in Wastewater Treatment – A Technical Reference Document Ref 01/WW/13/3