SWP 371 - Toxicity Test

Procedure	
To ascertain the suitability of processing new waste streams through the effluent plant and to provide information to enable decisions for treatment to be made.	
Purpose	
The purpose of this procedure is to ensure that all activities take place in a controlled manner and without accidents or incidents which may harm the health and safety of personnel or contravene the conditions of the environmental permit.	
Scope	
Applies to ALL WORKERS	
Associated Risk Assessment	**Associated MS Forms**
RA-0	MS70,
PPE Requirements	**Tool & Equipment Requirements**
Disposable nitrile gloves Safety Glasses Safety Boots	3 x 500ml Measuring Cylinders Aquarium Pumps Rubber tubing Air Stones Beakers
Safety Requirements	
Ensure you understand any chemical or biological hazard associated with a sample before you test it. Request a COSHH assessment if necessary.	
Ensure you wear the correct PPE for the task.	
MBG DRIVERS/OTHER STAFF MUST CARRY OUT A DYNAMIC RISK ASSESSMENT ON ARRIVAL AT THE WORK AREA TO IDENTIFY SITE SPECIFIC HAZARDS AND ENSURE THEY ARE ADEQUATELY CONTROLLED PRIOR TO COMMENCING THE TASK. **IF THERE ARE ANY UNCONTROLLED RISKS DRIVERS MUST CONTACT THE SITE REPRESENTATIVE, IF SUITABLE AND SUFFICIENT CONTROL MEASURES CANNOT BE IDENTIFIED THE DRIVER MUST CONTACT MBG MANAGER** **A DYNAMIC RISK ASSESSMENT SHOULD IDENTIFY MOVING VEHICLES / MACHINERY, SLIP AND TRIP HAZARDS, OTHER WORK BEING CARRIED OUT IN THE VICINITY WHICH MAY IMPACT ON THE TASK, OPEN EXCAVATIONS / PITS / TANKS, OPEN WATER HAZARDS, RISK OF CONTACT WITH OVERHEAD OBSTACLES AND POWER LINES, ACCESS AND EGRESS, FALLING OBJECTS, WEATHER CONDITIONS, OTHER PERSONS.** **THIS IS IN ADDITION TO THE GENERIC RISK ASSESSMENT**	

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Method	
1	The sample is tested for the following parameters a. COD – SWP0151 b. pH – SWP0155 c. Ammonia – SWP0152 The results are recorded on MS70. From this the strength of the raw sample can be identified.
2	Set up 3 x 500ml measuring cylinders. Place air stones connected to tubing into the bottom of each cylinder and tape the tubing in place to stop them lifting out. Attach the tubing to aquarium fish pumps.
3	Add 500mls of oxygenated activated sludge, obtained from an on-line SBR to each of the measuring cylinders. Then add 50mls of generic non-hazardous aqueous waste from J Tank.
4	This first cylinder is kept as a control to establish a base line of digestion.
5	Add the sample to the next two cylinders. Based on the results from the standard testing above and previous knowledge of effluent plant testing, a decision can be taken on how much sample to use. For a weak sample, two samples to be run at 2ml and 5ml in each cylinder. For a stronger sample 1ml and 2 ml to be run. Sample size can be discussed with a member of management as there is no chart or trending which can be used for this process due to the variables involved, for example a sample with a higher pH is likely to treat better than a lower pH, or an elevated COD will maintain an elevated pH naturally during the nitrification process so the larger band of sample volume would be suitable.
6	The aquarium air pumps are turned on at the wall socket.
7	A sample of about 50ml is taken from all measuring cylinders and tested for a. pH b. Ammonia c. COD For COD and ammonia is will be necessary to let the sample settle enough to take clear liquid off the top to enable an accurate reading from the DR2800 colorimeter. Time, Date and Results are logged on the MS70. This provides the initial baes line.
8	The aeration chambers are left digesting the waste for 24hours. During this period they are to be monitored visually to ensure that the air flow to each chamber is similar.

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9	The air pumps are turned off at the wall socket and the samples left to settle for 15 minutes. A reading of the settled solids in percent is taken using the graduations on the side of the cylinder. A clear sample of about 50ml is taken from all measuring cylinders and tested for a) pH b) Ammonia c) COD For COD and ammonia is will be necessary to let the sample settle enough to take clear liquid off the top to enable an accurate reading from the DR2800 colorimeter. Time, Date and Results are logged on the MS70.
10	Providing the results have been reduced by a similar degree +/- 10% (not applicable to pH) in both the test chamber and the control, 50mls of settled liquor is to be removed from the chambers and more sample and leachate introduced as per steps 3 to 8 above.
11	This procedure is to be performed for up to four further days to ensure that no toxic build up occurs. If at the end of the five-day trial the results of the test chamber and the control are being equally degraded +/- 10% the sample is classed as suitable for treatment via the SBR's.
12	If the results have not been reduced by a similar degree after the first 24 hours, the trial can be restarted as detailed above but with a reduced sample amount being added. Before moving onto this stage a member of management must be consulted to confirm the new sample volume to be used.
13	If the results of the trial chamber and the control still do not reduce at similar amounts over 24 hours this reduction in sample addition can continue to be reduced in 1mls increments down to 1mls of sample. If the aeration chamber does not successfully treat 1mls of sample then the sample is classed as toxic to the treatment systems and cannot be treated via these systems. The waste cannot be accepted for treatment.
14	After three days a preliminary result can be reported to Sales giving a yes, no or more time is required answer. In the majority of cases it is expected that the results at this stage will allow us to know if we can process the incoming stream and further testing is required for developing the treatment routine. In exceptional cases we may require more time to give a definitive answer. This answer is to be discussed with the Site Manager and/or chemist and will take into account the amount of stream to be booked in and the current operating situation of the Effluent Plant.
15	When the final readings are taken. The system can be dismantled and cleaned and the results sheet taken to the main office.

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Document title	Version	Review date	Reviewer	Next review date	Approved by
SWP 371	1	10.2014	C Evans	10.2016	J Slate
SWP371	2	03.2017	M Akbar	03.2019	
SWP 371	3	03.2019	D Lewis	03.2021	
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