

## Appendix C3 3b – Fugitive emissions

Process 5 – Ferrous chloride manufacture. The method, in which this product is manufactured through open-top dissolvers, means that the fugitive emissions are also from the possible point source emission point. However, the only real potential fugitive emission is from the emptying of the sludge from the dissolvers and if the reaction is carried out properly and to completion, then during the emptying of the dissolvers there will be no fugitive emissions to air. The most realistic fugitive emission is to land, from the emptying of the sludge from the dissolvers and transferring it to the container for off-site disposal.

Process 6 – Ferric chloride manufacture. The method in which this product is manufactured is via the bubbling of chlorine gas through the ferrous chloride solution (potential for point source emissions) and then when extra millscale and possibly hydrochloric acid are added to these dissolving units. There is the emission of the Chlorine gas, but this will be monitored under point source emissions. There may also as like in process 5, fugitive emissions to land, from the emptying of the dissolvers to remove the undissolved sludge. Again it is the movement of the sludge from the dissolvers to the disposing container for the sludge to leave site that has the potential to reach land.

Process 7 – Sulphuric acid evaporator. As the acid will be arriving on site at a slightly lower strength, than required for the use in both process 4 and also for sale. The use of the evaporating system is to increase the strength of the acid and if there are any impurities, for them to be extracted at the same time as condensate. The only emission point (point source emission) is the condensate point and as such, there should not be any fugitive emissions from this process. However if the container that the condensate is to go into, is overfilled then this would be a fugitive emission to land. Therefore during the design of this system, all bunding and storage areas would meet the necessary requirements for the storage of chemicals and also any waste.

Process 8 – PolyAluminium chloride. This process has been operated at the Titan works facility for more than 25 years (permit DP3637SG), and the only fugitive emissions to air from this process are from the scrubber system. A basic water scrubber system is installed to clean any emissions from the venting of the reactors and storage tanks (where required). The filtration for this process, when being cleaned, does also have the potential for fugitive emissions to land.

Process 9 – Sodium silicate. This process like process 8, has been operated at the Titan Works site for more than 25 years (permit DP3637SG) and the only fugitive emission to air from this process is from the steam via the pressure release system. Due to the dense nature of this product, none of the steam has the final product entrained in it. Again, like process 8, there may also be a potential for fugitive emissions to land, which would be as a result of cleaning the filters. However, due to current manufacturing processes, this clean frequency has been reduced to typically once a year, but as with every process, if there is contamination of the raw materials, then the frequency of the clean would increase.

Process 10 – Sodium citrate. This process, requires due to the final destination and the product that is a raw material for, does have fugitive emissions to air, as part of the manufacturing process requires all equipment to be sanitized prior to product being manufactured, therefore the emission of steam to air is a potential fugitive emission to air. Also as the manufacturing process is also an

exothermic reaction, there is steam produced during the reaction and this is also a potential fugitive emission to air.

Process 11 – Aluminium sulphate. This manufacturing method has been in operation at one of Industrial Chemicals satellite sites (permit UP3730WV) since 1984 and has been operated under IPPC/EPR permit since 2006 (permit issued). This process produces steam from the exothermic reaction as its point source emission. Fugitive emissions to air, would be as a result of steam escaping the reactor via the point that the aluminium hydrate enters the reactor. The nature of the manufacturing process as described in appendix C3 Appendix 2 1 – technical description, means that the reactor lid has to be open due to the way in which the raw materials have to be added, to a) start the reaction, b) get the correct amount of aluminium hydrate into the reactor and c) start the quenching of the reaction by adding water and therefore generate more steam.