

Appendix C3 3b – Fugitive emissions – amended 25-06-2018

As seen in the various table 4's associated with C3 3b, there is the reference to odour, noise, vibration & fugitive emissions that may be related to the various processes proposed.

Process 5 – Ferrous chloride manufacture. The method, in which this product is manufactured through open-top dissolvers, using 28% Hydrochloric acid, means that the fugitive emissions are also from the possible point source emission point. However as the dissolver units are open top vessels it is not possible to accurately monitor any potential emissions, however it has been pre-determined from the Runcorn facility (this was a low impact permit until the variation to added the ability to manufacture ferric chloride) that only steam comes from the top of the dissolvers. As the strength of Hydrochloric acid is used is 28%, at this strength no fumes are emitted. The only real 'fugitive emission' from this process is the volume of sludge that is not dissolved by the hydrochloric acid. This sludge is comprised of the oily coating that the mill-scale is coated in, which enable the product to move freely and reduce the volume of rust on the product. This sludge is not suitable for re-use either in any other process and is then classified as a waste product, which will be removed from site for off-site disposal. The sludge is remove via digging equipment and cannot be washed to be removes as it cannot be pressed to remove any excess liquid. All of this waste will go off-site for specialist treatment prior to 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. This part of the process, has a scrubber unit attached to remove any unused chlorine gas and any fumes from the extra Hydrochloric acid used. There is the emission of the Chlorine gas, but this will be monitored under point source emissions. Chlorine monitors will be installed & operated continuously for this process and external monitoring by an independent third party will be used as well as due to all Chlorine detectors that are currently available are not Mcert certified, but are TUV (German equivalent) certified. 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 for the dissolvers to the disposing container for the sludge to leave site that has the potential to reach land. This sludge is not suitable for re-use either in any other process and is then classified as a waste product, which will be removed from site for off-site disposal. The sludge is remove via digging equipment and cannot be washed to be removes as it cannot be pressed to remove any excess liquid. All of this waste will go off-site for specialist treatment prior to disposal and is identical in raw material identification as that for Process 5.

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. As mentioned as a note to Table 4, the condensate from this process has yet to be determined as either a by-product or as a waste.

There are still discussions on going between ICL and the supplier as to if the condensate is returned to the supplier to be re-used.

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. There is now minimal solid waste produced by this process, due to the installation of a new filtering system, which enable the undissolved aluminium hydrate powder to be effectively washed to remove any hydrochloric acid from it. The wash water is then used as both dilution water in the process and also a small volume is used to rinse the cleaned aluminium hydrate powder back into the reactor ready for the next batch. This system is effective for 50 batches and then the spent aluminium hydrate powder is then cleaned for disposal as at this point all that remains are the trace minerals from the Aluminium hydrate that cannot be dissolved by Hydrochloric acid. This cleaned product is removed from site as there are no other processes within the Industrial Chemicals portfolio that could use it. The other source of fugitive emissions will be the Aluminium hydrate powder, this product is delivered damp, with a significantly high level of moisture, but over time, the product dries out. Then as the older product is moved from the building storing it, to the conveyor system that enables the correct volume to be measured into the reactors, there is an increase in the potential for dust emissions. The conveyor system will be enclosed to reduce the potential for the dry aluminium hydrate to be blown about.

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 (the steam is located in the coils that surround the reactor and have no contact with the product being manufactured). 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. There is a waste water produced, as the vessels & associated pipework is required to be sanitized by the customer due to the products that the sodium citrate is used in. The sanitization is carried out by introduction water that has come from the boiler system (in this sites case), it will be supplied via the DAA from permit SP3932JT.

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. Over the course of the year the volume of spent hydrate that is produced ranges between 25 to 50 tonnes. This filtrate is not suitable to be used in other processes and as such can only be disposed of. The wash water will always be used in the next batch with the exception of the final batch on plant closure. As it is used to start the reaction with the Sulphuric acid prior to the aluminium hydrate being added.