Attachment 4.9.2 Solvent Management

1.0 INTRODUCTION

This Industrial Emissions (IE) licence relates to a bio-chemical facility rather than a traditional pharmaceutical facility. Unlike traditional pharmaceutical facilities which use solvents in production, bio-chemical facilities primarily use organic solvents for decontaminating work surfaces and equipment. Very small amounts of solvents may also be used as buffers in the process, however the volumes of these solvents are insignificant.

The existing non-IE licenced facility also uses organic solvents as part of the printing processes and in smaller amounts during the production of the medical devices.

2.0 PROPOSED SOLVENT USE

Isopropyl Alcohol (IPA) used as 70% IPA on wet wipes (new bio-chemical facility) and 70% and 99.7% IPA in bottles (medical devices facility) will be used for decontaminating work surfaces in the production areas in accordance with Good Management Practices (GMP) practices.

It is anticipated that at a maximum, c. 4000 packs of IPA impregnated wipes will be required per year. The resulting equivalent quantity of IPA per year from pre-wetted wipes has therefore been calculated as c. 1.04 tonnes. The pre-wetted wipes will be stored in sealed packets within the Warehouse until required for use.

The annual use of IPA from the spray bottles is anticipated to be 250kg. This includes c. 24L of 99.7% IPA per year (stored in 1L bottles) with the majority of the IPA stored at 70%. Liquid IPA will be stored in sealed bottles in the Warehouse and in smaller cabinets in the production areas. The overall total IPA use for the proposed and existing facility is therefore 1.29 tonnes per annum.

In this instance the majority of the IPA in the impregnated wipes and the spray bottle will evaporate to atmosphere. Fugitive emissions limit values are therefore not feasible, neither is fugitive emission control, as the IPA is chosen for the fact that it evaporates completely. As the IPA will evaporate into room air it is also not feasible to treat by abatement as it would be present in Parts Per Billion (ppb) concentrations.

Di-methyl alcohol (DMA) and di-methyl sulfoxide (DMSO) will be used for dilution of the toxin for Monoclonal Antibody (MAB) conjugation in small quantities (6-12 litres).100% DMA/DMSO will be delivered to site in sealed 5L, 15L or 25L bottles and will be stored within the designated flammables area of the Warehouse. DMA for the MAB conjugation will be transferred directly to the conjugation suite where it will be pumped into the vessel using a peristaltic pump and single use tubing. There are no anticipated fugitive emissions from this process. The anticipated annual usage in production is up to 50kg for DMA and up to 352kg of DMSO.

Glacial acetic acid required in small quantities as part of the buffer solution formulation will be stored in sealed containers (1L bottles) in the Warehouse prior to use. These will be

dispensed directly into the buffer solution within an air-controlled environment. The anticipated annual usage in production is c. 2.6kg.

Within the existing processes, solvents are used as part of the printing process in which ink is printed onto the medical devices. The anticipated solvent usage per year is 0.9 tonnes. These solvents are typically inks and ink thinners. Solvents used in printing are stored in sealed containers in locked cabinets until use. A very small amount of mixed solvent is also used as a label and adhesive remover (0.0048 tonnes of AMBERSIL LABEL REMOVER per year).

3.0 SOLVENT ACTIVITY

On the basis that the proposed volatile organic solvent use is for the manual wipe down and decontamination of work stations and some process equipment, as part of good GMP practices, and is not used for bulk cleaning of equipment or vessels used in the production of the biochemical product, the use of IPA is not considered to fall within Statutory Instrument No. 565/2012 (Solvent Regulations), or Chapter V of the Industrial Emissions Directive 2010/75/EU. As such, the categories in Part I and Part II of Annex VII of the Industrial Emissions Directive (and similarly Schedule 1 and 2 of the Solvent Regulations) do not apply.

The use of DMA, Acetic Acid and DMSO in the preparation of the solutions for bio-chemical production would fall within Activity 8 of Schedule 1 and Activity 20 'Manufacture of Pharmaceutical Products' of Schedule 2 of Statutory Instrument No. 565/2012 (Solvent Regulations) or Chapter V and Annex VII of the Industrial Emissions Directive 2010/75/EU. However, as the annual volume of solvent to be used per year (c.0.4 tonnes) is significantly lower than the threshold for the solvent class (50 tonnes) the relevant restrictions and emission limit values do not apply.

The use of solvents in printing falls within Activity 9 (a) 'Printing - Flexography' of Schedule 1 and Activity 3 'Printing – Other' of Schedule 2 of Statutory Instrument No. 565/2012 (Solvent Regulations) or Chapter V and Annex VII of the Industrial Emissions Directive 2010/75/EU. However, as the volume of solvent used per year is significantly less than 15 tonnes the relevant restrictions and emission limit values do not apply.

4.0 CONCLUSION

The proposed IPA usage at both the new and the existing facility is anticipated to fall below 2 tonnes per annum which is below the threshold for surface cleaning. However, in addition to this the implementation of fugitive emission limit values by percentage are not applicable as the proposed use relates to the decontamination of work areas using wipes and spray bottles only.

The proposed DMA, Acetic Acid and DMSO use is anticipated to be c. 0.4 tonnes per year as such will not fall within the solvent use classes as outlined in Statutory Instrument No. 565/2012 (Solvent Regulations) or Chapter V and Annex VII of the Industrial Emissions Directive 2010/75/EU.

The volatile organic solvent consumption for the existing facility (printing) is anticipated to fall below 15 tonnes per annum and therefore the relevant restrictions and emission limit values for printing activities do not apply.

It is concluded that solvent use at the facility does not fall within the controls of Schedule 1 and 2 of Statutory Instrument No. 565/2012 (Solvent Regulations), or Chapter V and Annex VII of the Industrial Emissions Directive 2010/75/EU and a Solvent Management Plan is not required.

It should be noted that the volumes presented here are a conservative estimate only and that the actual solvent consumption for the new facility is not yet known. Further investigation will be undertaken once the facility is operational.