Westlake Associates

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CRL 2017_4 Environmental Risk Assessment

The proposed addition to on-site plant and processes simply involves placing bitumen-contaminated wastes into an insulated chamber with dry ice. This reduces the temperature of the waste such that the bitumen becomes friable and can thus be easily removed using physical separation, allowing for sustainable management of both metal and other components.

The environmental risks are, therefore, very low. No heavy nor noisy plant is required and there are no odours produced that would require separate consideration within a risk assessment.

The risks to the environment are summarised as follows:

1. Carbon dioxide (as 'Dry Ice') achieves temperatures (-4^{O}C) that enable effective materials separation and will be used within the proposed process. This carbon dioxide is manufactured through sublimation from the atmosphere and therefore when released back to the environment is carbon neutral;
2. Initial calculations, using referenced data, show that staff on site will breathe out more than 1 tonne of carbon dioxide in a working year, and while predicted usage of CO_2 is unknown at this stage, it is unlikely to significantly exceed this value;
3. The site permit already allows for the storage and management of CO_2;
4. As well as the logic described above, Dry Ice has been chosen as the preferred cryogen because of the significant reduction in H&S risk compared to other cryogenic media such as liquid Nitrogen ;
5. As a result of the planned processing, more wastes will be re-used/ recycled and less sent to landfill, with an associated reduction on the environment relating to wastes transport and disposal activities.

Current expectations are that the site will use no more than 3 tonnes of CO_2 each year. As the average car diesel engine emits approximately 2.7kg per litre of fuel (USEPA https://www.epa.gov/sites/production/files/2016-02/documents/420f14040a.pdf accessed 14 February 2017). This equates to a single motor vehicle using 1,111 litres in the same period, or 21 litres per week (approximately 250 miles per week according to engine size). As a result, the environmental will be extremely low, even ignoring the reduced impacts of lower tonnages of wastes to landfill and reduced wastes transport.

The main human health risks are those of asphyxiation in enclosed spaces (especially, because of the relative density, at low levels) and cold 'burns'. The former will be managed by processing in the open air to eliminate any enclosed spaces, and the latter by the use of appropriate PPE when handling equipment as outlined below. Dry Ice is very cold and can cause skin damage through direct contact and as a result the following procedures will apply:

1. Insulated gloves will always be worn when handling any object that has been in contact with or that contains Dry Ice. Loose fitting gloves are recommended so that they may be discarded quickly in the event that any dry ice flakes into them.
2. When working with open containers of Dry Ice, boots will be worn and trousers will not be tucked into the boots, but worn outside.
3. The Dry Ice will be stored in cryological containers that have been designed and constructed to withstand the temperature variances involved in the process.

The materials to be treated (e.g. electrical cable and metal that are covered by existing permit conditions) are themselves truly inert or very inert in terms of potential to impact upon the environment and though the weight of waste to be stored may be relatively high (but covered by the existing permit and associated conditions), the associated pollution potential will be very low.

The reaction tank itself will be made of externally-insulated high-grade steel and will be covered with an insulated lid to limit gaseous release to the environment. Once waste equipment has been placed in the tank, the lid will be closed and the equipment left to 'soak' for a period of time determined by the nature and mass of the waste being treated.

There will be no fugitive emissions, nor 'nuisance'-related risks (e.g. dust, vermin, litter).