16 Marcus Clarke Street, Level 7
Canberra, Australian Capital Territory 2601
Australia
ghd.com

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Our ref: 12524108

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Kendall Clydsdale
Principal Case Manager
Office of the Independent Planning Commission NSW
Suite 15.02, Level 15, 135 King Street
Sydney NSW 2000
Via email to: [redacted]

Opinion on the proposed Moss Vale Plastics Recycling and Reprocessing Facility – Response to Concerns Regarding Microplastics and PFAS Emissions

Dear Mr Clydesdale

My name is Dr Mark Bowman and I am a GHD Technical Director for Environment and Contaminants with over 20 years' experience as a scientist, program manager, regulator and consultant, working with legacy and emerging contaminants including persistent organic pollutants such as PFAS and micro-plastics.

Over the course of my career, I have worked on many projects to manage the impacts of various contaminants in the environment including in the waste, water, agriculture, industry and government sectors. I was recognized for my ongoing contributions to contaminant management when I was made a crcCARE Fellow at the International Cleanup Conference in Adelaide (2022).

I have been asked to provide my opinion on the possibility of significant quantities of PFAS entering the local environment as a consequence of the operation of the proposed Moss Vale Plastics Recycling and Reprocessing Facility (the proposal).

I note that a number of concerns were raised during the NSW Independent Planning Commission public meeting held at Bowral on 28 October 2024. Several members of the community who addressed the meeting raised the potential for the facility to release unsafe levels of microplastics and other chemicals such as PFAS into the surrounding environment.

While respectful of their concerns, in my opinion the potential risks raised are not significant given the design features of the facility, the proposed mode of operation and the appropriate and stringent regulatory controls that would be enforced during normal operations.

The facility has been designed to minimise the potential for release of plastics and chemicals that may be present in materials accepted for processing directly to the environment. These controls will include a combination of processes and equipment design features that will enable positive containment of any microplastics generated by specific operations in accordance with relevant regulatory guidelines and licensing conditions.

It is possible that some plastic items that may be processed at the facility could contain small amounts of PFAS. These PFAS are sometimes present in everyday household items such as clothing, packaging, non-stick frying pans and makeup. They have received a lot of media attention recently because of their widespread presence in the human body as well as the natural environment.

During commissioning of the facility, testing of the emission control systems would be conducted to verify that microplastics and PFAS that may be present in received materials are captured and appropriately managed so that no unacceptable risks are posed to the community and environment. There should be no

plausible completed pollution pathway from the proposed site to downstream waterways based on the comprehensive series of controls proposed for the site. For example, water used during facility operations to wash shredded plastics will be carefully managed via a closed loop recycling system. The operation of the system for treating and cleaning wash water and recirculating it means that discharges of spent wash waters to the Council sewerage system are expected to be below 10 kilolitres per day on average. This is equivalent to a large sized rainwater tank.

As per the project description in the EIS, Plasrefine Recycling proposes to build its own wastewater treatment plant (WWTP) on site, which would be a dissolved air flotation (DAF) plant, and as such, effective in removing microplastics from water that is continuously recirculated and any excess (treated) washwater that may be occasionally disposed to sewer.

DAFs remove suspended particles (including microplastics) from the water and make it suitable for re-use within the plant. This process injects compressed air into the incoming water, and once the aerated water is released into the flotation tank, fine air bubbles attach themselves to the particles, making them float. The floating material is then skimmed off the top of the tank and dewatered in a screw press to produce a spadeable filter cake. A DAF process is capable of removing more than 90 percent of suspended solids, including any entrained microplastics, which may or may not contain trace amounts of PFAS.

The filter cake would be disposed of to an appropriately licenced waste facility. It would be classified as general solid waste, which can be disposed of at most landfills in NSW.

Any processed water discharged to sewer would be received at the soon to be upgraded Moss Vale Wastewater Treatment Plant (WWTP) that will further treat discharged process water that might contain any residual microplastics. Council has indicated in its letter of 8 March 2024 to GHD that it expects the upgraded Moss Vale WWTP to be able to remove approximately 90 per cent of microplastics, and said that any industrial scale source for microplastics should be addressed at the source, rather than the treatment works. It estimated that the addition of Plasrefine wastewater could increase the total amount of microplastics received at the plant by between 10 and 50%, based on an estimated microplastics concentration of 40 mg/l after treatment.

As noted above, the proposal includes an on-site wastewater treatment plant with the capability of removing more than 90 per cent of suspended solids, including microplastics. Recent studies[1] have shown that microplastic particles were found to be removed mainly from WWTPs in the primary treatment zones via solids skimming and sludge settling processes. The results of this study further suggest that effluent discharges from both secondary and tertiary wastewater treatment facilities contribute only minimally to the microplastic loads in oceans and surface water environments.

The contribution of domestic and other sources such as industry are likely to be even more significant that those from the proposal, which are expected to be less than 1% of the dry weather flow to Council's Moss Vale WWTP (4.6 ML/day according to the 2023 WWTP REF). Council's letter of 8 March 2024 estimated that the current WWTP is already receiving between 0.4 – 4 kg of microplastics per day from domestic and other sources. At 10 kl/day discharge, the Plasrefine facility would contribute 0.4 kg/day. This could be further reduced by the additional filtration before discharge.

Testing to confirm that the concentrations of PFAS in wash water discharged to sewer meet Council's trade waste agreement limits will be performed during commissioning of the facility. Most PFAS present would be expected to remain entrained in the plastic and therefore captured for appropriate disposal. It is understood that there are no limits currently for microplastics or PFAS, but a limit of 300 mg/l exists for suspended solids, which the onsite Plasrefine WWTP can easily achieve (less than 40 mg/l of suspended solids is expected).

While the proposal design would ensure positive control of microplastics and PFAS, steps are being taken under the National Packaging Covenant with industry to progressively phase out the use of PFAS within plastics that may be sent to the plant[2]. The Department of Climate Change, Energy, the Environment and Water (DCCEEW) is consulting on imposing mandatory national requirements for packaging circularity, including bans on problematic materials and chemicals of concern such as carbon black, oxo-degradables,

[1] **Transport and fate of microplastic particles in wastewater treatment plants – ScienceDirect**
[2] **Australia plans major overhaul of packaging regulation | Food Packaging Forum**

and PFAS. All packaging placed on the Australian market would be regulated. Packaging must be designed to be recycled at scale, and bans would be placed on materials and additives that impede recyclability, with progressive bans of packaging that does not meet a minimum recyclability threshold would also be implemented.

These reforms if enacted in combination with the Industrial Chemicals Environment Management Standard (iChEMS) scheduling decision for the most challenging PFAS[3] including Perfluorooctanoic acid (PFOA) and related substances, Perfluorohexanesulfonic acid (PFHxS) and related substances and Perfluorooctanesulfonic acid (PFOS) and related substances are expected to see a continuing reduction in PFAS contained within materials including plastics sent for recycling. The time until the facility is scheduled to open will provide further opportunity for these important PFAS control initiatives to be implemented, effectively reducing the potential amount of PFAS that may be within plastic feedstock received at the proposal.

Risks of PFAS release from air and dust emissions are expected to be negligible based on the process design for handling raw materials during normal operations. Processing of materials at the facility will not include combustion of plastics, which is normally associated with PFAS emissions to the atmosphere. Heating of recovered plastics would be undertaken to allow reformation and extrusion into new products and materials, but would not result in significant risk of PFAS emissions.

The most plausible pathway of interest with respect to generation of airborne emissions of microplastics is associated with shredding and size reduction operations. Risks of this processing would be effectively contained through enclosing these operations and using air extraction and filtration systems capture any airborne particles. Following this, washing of the plastic fragments/flakes would also assist in minimising dust generation, noting that the particles would become entrained in the wash water, but captured in the on site WWTP, as described above. Testing during commissioning would verify that air emissions meet the levels outlined in the EIS and EPA licence.

GHD's dispersion modelling, which was presented in the Amendment Report Response to Submissions (ARRTS) dated February 2024 demonstrated that commercial receptors (at the adjacent Australian Bioresources facility) would meet the PM10 and PM2.5 criteria, with no exceedances when assessed on a day and nighttime basis. ABR does not have workers at its facility at night times. This modelling indicates that control of air emissions from the facility will meet required regulatory requirements and provide for appropriate control of potential microplastics emissions.

In summary, the proposed controls at the proposal will, in my opinion, appropriately protect the community and environment. I note the concerns raised during the recent public hearings by members of the community and stakeholders with respect to the potential for the facility to release microplastics and other chemicals such as PFAS directly into the surrounding environment. I can see no plausible basis for this conclusion given the extensive precautions planned for the site under normal operations. The facility will be appropriately regulated and scrutinized to provide transparency and confidence to the community that the facility remains operating safely. It is my view that the proposal has been designed to minimise environmental impacts, and protect the community and environment during construction and operation.

Regards

[redacted]

Dr Mark Bowman
Technical Director, Environment and Contamination
PhD (Syd) B Appl Sci (Hons) (Adl) BSc (REM) (ANU))

[redacted]

[3] **IChEMS Online Register – DCCEEW**