

Best Management Practices to Reduce or Prevent Potential Air, Odour, Noise and/or Dust Impacts to Surrounding Communities from Microbreweries and Nanobreweries

On December 15, 2021, the Ministry of the Environment, Conservation and Parks (Ministry) posted a proposal on the Environmental Registry of Ontario (ERO) to streamline environmental permissions for microbreweries and nanobreweries through self-registration, exemptions and the removal of unnecessary technical reporting requirements. The Discussion Paper provides the full details of this proposal.

This Best Management Practices (BMP) document supports the proposal and contains voluntary proactive measures and routine operational activities a small-scale brewery facility should take to reduce or prevent to potential air, odour, noise and dust impacts to the surrounding community.

This proposed BMP will be especially beneficial for exempted nanobreweries not subject to operating requirements under the proposed EASR regulation for microbreweries. A microbrewery could use the BMP to voluntarily go 'above and beyond' the operational requirements of the proposed EASR regulation to reduce or prevent potential or actual odour, noise and/or dust impacts on the surrounding community. New breweries should consider the BMP and the installation of mitigation measures before operation. For example, considering the placement or location of production equipment to minimize potential impacts on noise receptors.

The BMP will also inform facilities on practices that can be undertaken should a complaint related to odour, noise and/or dust occur. The BMPs are also useful for municipalities to inform on abatement activities under local by-laws to get nanobreweries back into compliance if nuisance odour, noise and dust complaints are received.

The following provides an overview of the potential sources of odour, noise, and fugitive dust from a nanobrewery or microbrewery facility that could impact the surrounding community. Each section has related BMPs to mitigate these sources proactively or in response to complaints. Facilities are encouraged to review and consider the implementation of BMPs as part of their operations.

Odour:

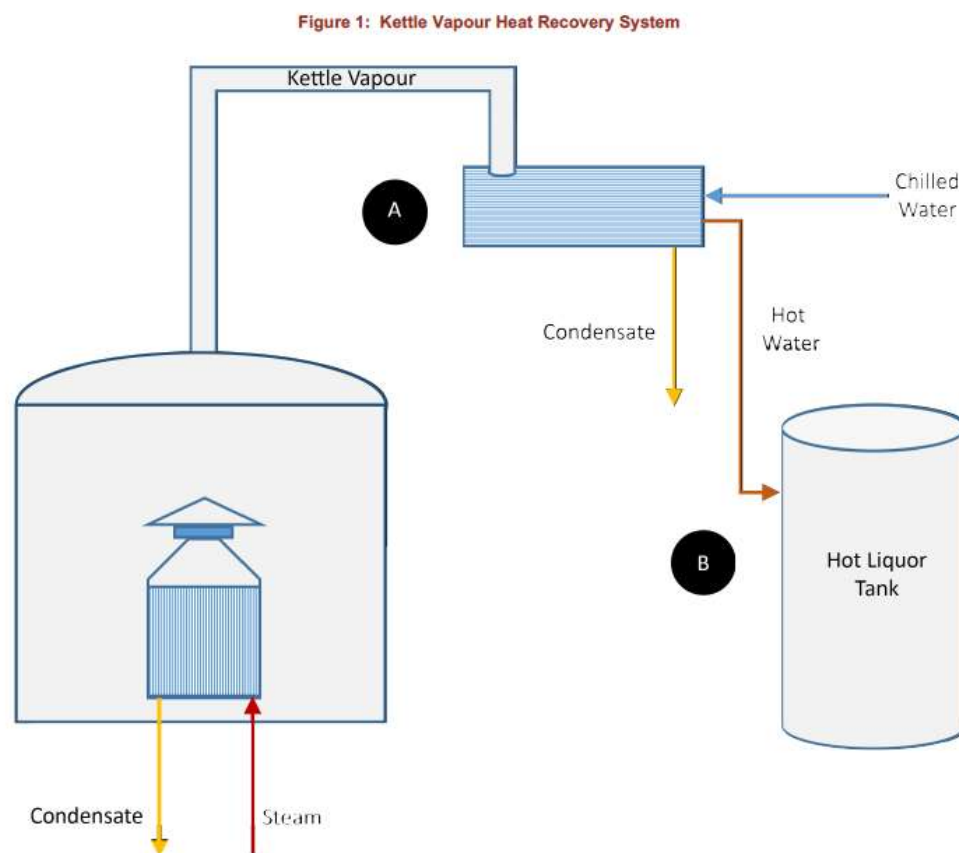
Coming from brewhouse operations, primarily wort boiling, fermentation, yeast storage and spent grains storage

Kettle Vapour

Vapours from boiling wort in the kettle is the most significant odour from a brewery which affect the natural environment. Water soluble components in the vapour coming out of the kettle stack can be eliminated through condensation of the kettle vapour.

Most commonly vapours are condensed through a heat exchanger (A) with cooling water and sending the heated water into the hot liquor tank (B) or directly to drain (see Figure 1). If the wort cooling process is not producing enough hot water for brewing, this water and energy can be fully recovered.

An alternative method is to condense the kettle vapour and recover the energy using a closed loop cooling system. The heat in the vapour is used to heat water to 97 °C and it is then stored in the energy storage tank. This hot water can be used to offset steam to heat the mash tun or preheat lauter tun runoff on route to the kettle. The benefit of this system is not only elimination of the odour concern but also offsetting fuel consumption, reducing GHG emissions and saving money.



Best Management Practice:

- ✓ **Installation of vapour condenser to capture and condense vapours from the brew kettle.**

Other Odour Sources

Hot wort in the mash vessel, lauter tun and whirlpool, fermenter venting, and storage of waste yeast and spent grains have a lower overall environmental impact but can result in complaints from neighbouring properties if not managed effectively.

Fermenting gas contains CO₂, an odourless gas, which should be vented externally to prevent buildup around fermenters to levels that are hazardous to workers. This vent should be extended to the roof, high enough to dissipate CO₂ into the surrounding air. This is generally adequate to also dissipate sulfurous compounds found in fermenting gases.

Small breweries commonly vent the fermenter internally into a water trap to dissolve these water-soluble compounds and then send to the process drain. CO₂ can pose a hazard to worker safety if it is allowed to build up inside the building. Adequate ventilation and installation of a CO₂ meter with alarming function will mitigate this hazard and alert workers of a hazardous CO₂ buildup.

Waste yeast and spent grains should be stored on site for as little time as possible and stored in sealed containers or tanks.

Best Management Practice:

- ✓ ***Venting of fermentation vessels and/or tanks through a water trap***
- ✓ ***Seal waste yeast and spent grains in storage containers***
- ✓ ***Avoid outdoor storage of spent grain***
- ✓ ***Pooled water within the facility must be removed***
- ✓ ***An operating procedures and maintenance program***

Additional Best Management Practices with Capital Investment:

- ✓ ***Installation of common vent stack to vent CO₂ externally***
- ✓ ***Installation of CO₂ monitor***
- ✓ ***Assess ventilation is adequate to prevent CO₂ buildup and, if needed, complete upgrades to provide adequate ventilation***

Noise

Associated with air compressors, glycol chilling systems, malt milling and transfer, external fans and condensers and internal packaging equipment. Receiving of goods such as malt unloading can also contribute to excessive noise being transmitted to properties surrounding the brewery. The preferred method for controlling noise from stationary sources is to implement noise control measures at source. Consider the following noise reduction solutions:

Best Management Practice:

- ✓ ***Shift or limit the operating hours for specific equipment; for example, limiting the hours of operation for activities such as shipping and receiving using trucks to 7am-7pm or the hours reflected in a municipal bylaw;***
- ✓ ***Limit truck idling on the premises;***

- ✓ ***Avoid use of refrigerated trucks***
- ✓ ***Place or relocate noise sources to take advantage of distance and shielding***
- ✓ ***Install vibration isolation for mechanical equipment***
- ✓ ***Do not pneumatically unload products***
- ✓ ***All doors at the facility are kept closed except when being used for normal ingress and egress of production material and personnel***
- ✓ ***Windows are kept closed unless there are no noise generating operations underway.***

A key noise source for beer production facilities are building ventilation and/or air exhaust for indoor equipment. For such systems the noise is generated by the fan. The sizes (i.e. flow rate and static pressure) and types of fans used for such purposes vary amongst facilities and equipment. The following are recommended to mitigate noise impacts from building ventilation and/or air exhaust:

- ✓ The manufactures rating for static pressure of each fan associated with any equipment cannot exceed 38.1 millimeters of water column (or 1.5 inches of water column); the exception to this is the cyclone.
- ✓ The manufacturers rating for the volumetric air flow rate of individual process equipment exhausts do not exceed 11.8 m³/s (or 25,000 cfm) as specified at standard temperature (20 degrees Celsius) and pressure (1 atmosphere or 101.3 kilopascals).

Facilities should consider hiring a person who has obtained the appropriate education and training and has demonstrated experience and expertise to test static pressure and volumetric air flow rate if the manufactures rating is unknown.

Additional Best Management Practices with Capital Investment:

- ✓ ***Select equipment with lower sound levels***
- ✓ ***Install acoustic enclosures around equipment or components***
- ✓ ***Add sound insulation to rooms with noise generating equipment***
- ✓ ***Windows, doors and over-head bay doors have a minimum noise rating of STC30¹***

Fugitive dust

Particulate matter that becomes airborne. This is normally from operations such as malt milling and transfer. The main sources of fugitive dust emissions are the transfer and storage of malt. Cyclones and bag filters can be used to collect dust. This dust can be conveyed to the mash tun or disposed of with spent grains as animal feed. A dust

¹ Older buildings with single glazed windows and unsealed window gaps likely do not achieve STC30 rating; therefore, noise from interior of the beverage facility can be more audible outside of the building envelope than those considered in the BMPs.

collector is essential if the operations includes the milling of grains and there is a discharge to the atmosphere.

Best Management Practice:

- ✓ ***Install a woodworking-type dust collector with grounded hose and mount the power unit outside classified area around malt mill or bag dump station in accordance with area classification***

Additional Best Management Practices with Capital Investment:

- ✓ ***Install a cyclone dust collector or bag filter system to collect dust from the malt mill/conveying system. The dust collector should be located outdoors, or be equipped with an explosion panel & vented directly outside in accordance with area classification.***

General Best Management Practices for Odour, Noise and Dust

- ✓ ***Institute a mechanism to record and respond to complaints***

Nanobreweries are proposed to not be subject to registration under the proposed microbrewery EASR regulation² may want to consider the following as they consider locations and begin operations:

- ✓ Avoid use of diesel as a fuel source
- ✓ Obtain the appropriate permission if using spent grain as fuel source³;
- ✓ The facility should have an agreement or permission in place for water taking and discharges to the environment, including:
 - Sewage/Wastewater
 - an approval under the Building Code for an on-site septage system if the discharge from brewery and other activities will not exceed 10,000 L/day; or,
 - an agreement with the municipality to discharge to the municipal sewers or a permission for sewage if the discharge from brewery operations and other activities is to exceed 10,000 L/day.
 - Waste - an arrangement with the municipality, a private hauler, or a permission for waste
 - Water – water for beer manufacturing is provided through the municipality, from a private well in compliance with the Small Drinking Water System program regulations, or, if taking more than 50,000 L per day, through a Permit to Take Water
- ✓ The facility has the required permits to operate at the location, such as a municipal permit/licence to operate as a brewery within the appropriate zoning designated by the municipality.

² Specifically, nanobreweries are proposed to be exempted from the requirement for an air approval under section 9 of the *Environmental Protection Act*

³ A facility that uses spent grains as a fuel source may need an environmental permission, such as an Environmental Compliance Approval or Renewable Energy Approval.

This draft document was prepared as part of public consultation on the Environmental Registry of Ontario (ERO) - proposal note (ERO # 019-4062) - *Streamlining Environmental Permissions for Microbreweries and Nanobreweries Through Self-Registration and Exemptions*

- ✓ The facility should avoid locating on a property that also has a child-care facility, health care facility, senior citizens' residence or long-term care facility, or an educational facility.
- ✓ The facility should avoid locating within a building that has another unit within the same building involved in beer production.

This document was developed in a partnership between the Ministry and the Ontario Craft Brewers association to support the Environmental Registry of Ontario (ERO) proposal posting to streamline environmental permissions for microbreweries and nanobreweries through self-registrations and exemptions. This BMP document would be made publicly available on the Ontario Craft Brewers website if the decision is made to implement the proposal following the ERO comment period.