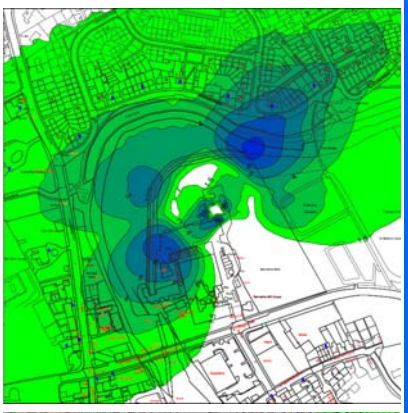
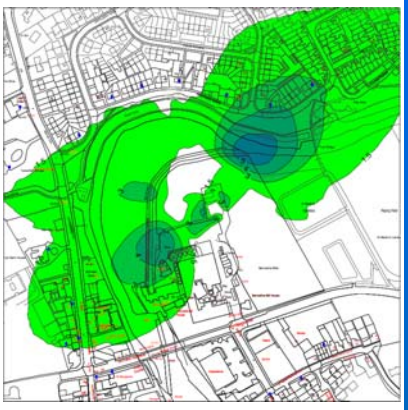
Pure Malt





A local Council had served Notice on a grain roasting process in terms of Section 80 of the Environmental Protection Act 1990 due to concerns that odour from the installation was causing a statutory nuisance. The installation is located within an industrial zone with residential receptors ~130m to the north-east. Pure Malt appointed The Airshed to advise on what measures were required to help achieve the best practicable means (BPM) to abate odour impacts.

The grain is roasted in batches, where each batch takes approximately 150 minutes. The emissions from the grain roaster are passed through an afterburner to oxidise process odours and released from a 22.7m high stack. The roasted grains are then cooled using ambient air for ~1 hour, and spent cooling air is released from a separate 18.7m high stack. These batch processes operate on a 24 hour basis.

The process operator commissioned emission tests on the grain roaster plant in January and again in March 2016 to help optimise the performance of the afterburner. This exercise reduced total VOC emissions by a factor of ~10. Following these tests, a series of odour samples were extracted from the grain roaster and cooler stacks to quantify the odour emission rates from the process.

This found that the odour emissions from the process were not steady state and fluctuated: the odour from the grain roasting operation peaked mid-cycle, whereas odour from the cooling process peaked at the beginning. The odour emission rates for the grain roaster ranged from ~7,815 OU_E/s – 39,219 OU_E/s over the 150 minute roasting cycle. Odour emission rates from the cooler ranged from 12,181 OU_E/s to 32,486 OU_E/s, over a typical cooling cycle of ~60 minutes.

Airshed used a dispersion model (ADMS 5) to predict odour around the installation for three Scenarios: Scenario 1 – assumed the peak odour emission rate takes place at all times 24 hours per day, 365 days per year; Scenario 2 – assumed odour emission rates alternate hourly (between 19,430 OU_E/s and 39,219 OU_E/s with slightly varying exhaust temperatures and exhaust gas flows for the grain roaster and where the cooler operated at the end of the grain roasting process with at least one hour down-time); and Scenario 3 – where the odour emission rates from the grain roaster and cooler were based on the average odour emission rate over the cycle.

The worst case impact assessment indicated that odour was predicted to be 4 OU_E/m^3 1 hour 98%ile at the worst case receptor, based on the existing stack heights. Increasing the height of the cooler stack to 22.7m (to the same height as the grain roaster stack) and increasing the efflux velocity on the cooler to at least 15m/s was predicted to reduce odour to $\leq$3 OU_E/m^3 1 hour 98%ile at all sensitive receptors. Odour from the grain roasting and cooling operations is neutral in character and is a less offensive odour and a benchmark of 6 OU_E/m^3 1 hour 98%ile should provide an adequate level of protection for local amenity.

Following the findings of this study the local Council concluded that the process had successfully adopted BPM and were complying with the terms of the Notice.

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