

22 March 2013

**Post Collections**

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Attention: James Laycock<james@blueprintplanning.com.au>  
By e-mail only

Dear Sir,

**Re: Fire Risk, Plastic Contamination and Nuisance Birds**

Further to your recent request for further information from Transpacific Cleanaway in regard to:

- Fire risk i.e. the possibility that compost material may spontaneously combust,
- The removal of plastic contaminants during the screening of compost, i.e. the possibility that plastic material may not be removed during screening processes, and
- Nuisance birds i.e. the possibility that birds may carry plastic or organic material outside the site,

I wish to advise the following:

***Description of the composting process with regard to fire risk***

Organic matter (be it composted or uncomposted) provides a potential source of fuel that will burn if certain physical and chemical criteria are met. These are that sufficient oxygen is present around the material and that the material, wholly or in part reaches its ignition temperature. The finer the material, the easier it is to reach its critical temperature. On a composting site, oxygen is not limiting and plenty of fine material is present. The critical factor is the presence of a source of energy to ignite the material.

In the case of organic dust and fines (leaf fragments, paper, plant fibres, etc) the established ignition temperature range is from 210°C upwards. In other words, compost (or a small patch of it) must reach over 210°C before it will start burning. If the compost is damp, it must be exposed to this temperature for a longer period as the water will absorb the energy as latent heat of vaporization and will prevent the temperature from reaching the ignition point. What then are the sources of heat that can cause fires on a compost site?

1. The heat generated by the compost process itself. This is commonly supposed to be the greatest danger but is, in fact, an urban legend. Heat produced in compost is liberated by thermophilic micro-organisms (bacteria, fungi and actinomycetes (actinobacteria)) and the temperature never exceeds 85°C. If it were to do so, these organisms would start to die off, the production of heat would decline and the temperature would fall. But even at 85 degrees, this is well below the

- ignition temperature required for the material to start burning. There is also an automatic negative feedback in terms of the compost moisture. To live, the micro-organisms require the compost to have between 40 and 65% moisture. At this level, the compost is too wet to burn. With time, it will start drying out, but then it becomes too dry to sustain the microbial activity, heat production falls and the temperature declines. In short, the endogenous heat produced in a compost heap is not nearly enough to induce "spontaneous" combustion, especially on a well run site where compost is not permitted to dry out.
2. Cigarette butts. These are a known cause of fires at compost sites, particularly at those that are poorly managed. On a well run site, compost is kept reasonably moist to sustain the micro-organisms and this ensures it is not combustible. On a well run site, there is minimal dust, no litter and limited stockpiling of loose combustible material and staff have the training and supervision not to be smoking or discarding butts on site.
  3. Unsafe electrical connections or wiring. On old, ill maintained and badly run compost sites, electrical discharges can cause fires. On professionally run sites, this is not an issue.
  4. Static discharges. Under situations where there are dense airborne concentrations of organic dust, static discharges can cause explosions and fires. On the proposed Gerogery composting site, there are no sufficiently enclosed areas where such situations could arise and reasonably high moisture content of the compost together with active dust suppression ensures that dust is not generated in sufficient quantities to produce dangerous conditions.
  5. The refractive concentration of sunlight through pieces of glass in the compost. If compost is suitably dry, if there is loose material close by and if a piece of contaminating glass just happens to be angled in such a way that it focuses the sunlight on some fine, fluffy organic matter, this can ignite a fire. This is the same process whereby a magnifying glass is used to start a fire. However, if the compost is of suitable moisture content and if the working surface between heaps is clean, the fire will not be able to sustain itself. At worst it will propagate as a slow smoulder until revealing itself by its smoke at which point staff will use the hoses and hydrants on site (these being provided to add water to the compost) to thoroughly douse the affected material.
  6. Sparks or fire balls being blown in from bush or grass fires burning upwind of the site. Once again, the amount of material on site that is dry and combustible enough to catch fire is limited. The material is also not contiguously spread over the site, but in distinct managed heaps with large clean, vacant areas in between.
  7. Acts of arson. Any arsonist would have to be quite determined to damage the site and would discover that while superficial damage could be caused quite easily, setting the compost ablaze would be very difficult.

#### ***Processes to remove plastic from the organic waste stream***

Cleanaway has committed itself to producing compost that at a minimum, complies with AS 4454:2012 (the Australian Compost Standard). Cleanaway has many years experience of making commercial quantities of quality compost that are sold into both agricultural and horticultural markets. These markets are repeat business. They require sustainable high quality inputs, for the production of food products for human consumption; conditions that Cleanaway has a proven record of meeting.

Cleanaway will produce composts that have lower contamination than the standard through its accredited management practices. Cleanaway follows best practice in reducing contaminant levels by maintaining a robust community education campaign, monitoring organic waste contamination in the kerbside bins, decontaminating the raw feedstock upon receipt and ensuring that the material that is composted is clean. Very little residual waste will be composted with the organic material and no reliance is being placed on the back end removal of contaminants. To be sure, odd pieces of plastic will get through the system, but they will be removed when seen during the process and will indeed come out at the screen if bigger than 20mm across. Only very small amounts of small pieces of plastic will be able to pass through the screen into the product and will be well within the permitted specifications.

#### ***Vermis & Bird control on site***

With experience gleaned from running other composting sites, Cleanaway is well aware of opportunistic feral and wild animals attempting to get an easy feed. The site has been planned, will be built and will be operated with this in mind. There is a narrow window of opportunity for birds or

vermin to get into the waste and remove pieces of food and/or food covered plastic and the task has not been made easy for them.

When the waste arrives, it is enclosed in a sealed truck which drives in under a roofed off-loading area. Passing birds will not see the material. If they hang around the shed and fly inside to investigate what is happening, they will be dismayed by the scant opportunity they have to gain access to it. After being off-loaded, it is mechanically spread within a minute or two. All the while staff will be standing to the side. Once spread, the machine withdraws and personnel move in to remove contaminants. Very few birds will be brave enough to venture that close to humans. Once decontaminated, the material is mixed and pushed into a heap deep inside the shed. The only access birds are afforded is through the vehicle entrances – all other openings are screened with mesh to specifically exclude them. The heap at this stage has its food content buried amongst green waste and is not particularly attractive to birds. It contains no visible plastic as all of it has been removed.

Within three hours at the longest, this material is passed through the shredder and emerges as a mixed chopped up mass, with very little visible food. In this form it is of even less interest to birds. It is temporarily stockpiled inside the shed. Before the end of the day, this material is transferred by front-end loader out of the shed to a Gore pad and is built into a windrow. It is promptly covered with a Gore cover and is no longer visible or accessible.

The next time it sees the light of day is after four weeks composting at which stage no feral animal has any interest in it at all.

It is important to note that around 85% of the material received (non-food waste) does not attract any species of wild or feral animal. Of the remaining 15% food waste, much of it is of no interest to any bird. Potatoes, pumpkin peel, lettuces, onions, oranges, cabbages, etc have no pulling power. It is the small amounts of meat, bread, fat, broken biscuits etc that have the nutrient content to attract pests. The fact that most of the food waste is in cornstarch bags also tends to hide it and escape the attention of birds & vermin.

Should any further information be required I can be contacted on 02 8700 2114 or 0403 363 289.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'G. Hemm'.

Geoff Hemm, BSc (Hons)  
Organics Processing Manager  
Recycling Facilities