
Re: High level review and feedback on draft resource consent RC-2024-0136 for Kotatahi composting operation at 1047 Kaniere-Kowhitirangi Road

From Joe Wildy <joe.wildy@outlook.co.nz>

Date Fri 1/30/2026 12:20 PM

To Tony Ridge <tr@wrcr.govt.nz>

 2 attachments (324 KB)

RC-2024-0136 Decision.docx; RC-2024-0136 Annexure 1 & 2.docx;

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Hi Tony

Re: High level review and feedback on draft resource consent RC-2024-0136 for Kotatahi composting operation at 1047 Kaniere-Kowhitirangi Road

Overview of the Proposed Operation

The consent application seeks approval for discharges associated with a composting facility processing up to 4,150 tonnes of raw materials annually, including paunch grass (500 tonnes), various agricultural wastes like bark chip, sawdust, old bailing, silage, and used bedding (cumulative 3,000 tonnes), abattoir DAF wastewater sludge (500 tonnes), Karbon King fly ash (50 tonnes), and moss fines (100 tonnes). The operation focuses on managing potential effects such as odours, dust, and leachate during composting, with leachate irrigation to land. While the application appropriately addresses on-site discharges, it does not extend to the end-use application of the finished compost product across multiple sites, which could warrant additional oversight.

Overall, the draft consent includes strong general conditions for boundary effects, complaints management, and reviews under Section 128 of the Resource Management Act 1991. Specific conditions for air discharges, feedstock limits, operational parameters (e.g., C:N ratio, temperature, oxygen, moisture, pH), and the requirement for a Composting Site Management Plan (CSMP) are commendable. The leachate discharge conditions, including setbacks, application rates (not exceeding 200 kg N/ha/year and 20 mm depth per application), and monitoring, align with good practice. However, I suggest enhancements in feedstock transparency, waste tracking, soil monitoring, and specific handling of higher-risk materials like fly ash to mitigate long-term risks.

Comments on Fly Ash Use in Composting and Land Application

The inclusion of "Karbon King" fly ash at 50 tonnes per year creates some concerns and opportunities, given its potential role as a soil conditioner or amendment in composting. Fly ash, a byproduct of coal combustion, can provide benefits in composting and land application, such as improving soil pH (due to its alkalinity), enhancing nutrient availability (e.g., supplying silica, alumina, and trace elements), and aiding in moisture retention and texture modification. Research indicates that when co-composted with organic materials, fly ash can enhance the fertilizer value of compost by stabilizing nutrients and reducing pathogen risks through pH adjustments. For instance, studies on fly ash composting show it can increase phosphorus availability and support plant growth in nutrient-poor soils, contributing to sustainable agriculture and circular economy principles. In New Zealand contexts, fly ash has been successfully used in mine site rehabilitation and road stabilization, where it helps bind contaminants and improve soil structure.

During our phone discussion I mentioned I was part of the team at Solid Energy that managed the receipt of fly ash back onto mine sites (where we carefully managed its disposal).

As discussed, risks associated with fly ash must be carefully managed, particularly in composting destined for land application. Fly ash can contain elevated levels of heavy metals and metalloids (e.g., arsenic, boron, cadmium, chromium, lead, mercury, selenium, and molybdenum), which may leach into soil, groundwater, or surface water under certain conditions, such as acidic soils or high rainfall typical of the West Coast. High boron levels, for example, can be phytotoxic, while arsenic and selenium pose risks to aquatic life and human health via bioaccumulation in the food chain. In composting, if fly ash is not properly integrated, it could lead to uneven distribution of contaminants in the final product, potentially exceeding safe thresholds for land application.

New Zealand regulations and guidelines emphasize caution: The New Zealand Standard NZS 4454:2005 for Composts, Soil Conditioners, and Mulches requires contaminant testing to ensure safety. Regional councils, such as Bay of Plenty, explicitly advise against adding coal ash to compost due to its potential to introduce sulphur and heavy metals, which can toxify soil and harm microorganisms. The Ministry for the Environment's guidelines on waste management and biosolids application (e.g., NZWWA 2003 Guidelines for the Safe Application of Biosolids to Land) provide frameworks for assessing industrial wastes, recommending site-specific risk assessments. Under the Resource Management Act, discharges must not cause adverse effects, and the National Environmental Standards for Soil Contaminants (NES-CS) set limits for priority contaminants in soil.

To address these, I recommend the following additions to the consent:

- **Source Specification and Characterization:** Require the consent holder to identify the exact source of "Karbon King" fly ash (e.g., specific coal-fired plant or supplier) and provide representative analytical data on its composition, including heavy metals, pH, and leachability tests (e.g., TCLP or ASLP methods), prior to use. This aligns with best practices observed in my prior work at Solid Energy, where fly ash from variable sources required geochemical management to prevent leaching. Any deviation from approved characteristics should trigger notification to the Council and potential suspension of use.
- **Limits on Contaminants:** Incorporate maximum allowable concentrations for key contaminants in the fly ash (e.g., boron <50 mg/kg, arsenic <20 mg/kg, based on NES-CS thresholds for agricultural land), and mandate testing of the final compost product per NZS 4454:2005 Table 3.1 before off-site distribution.
- **Risk Assessment for Land Application:** Although the consent focuses on the composting site, include a condition requiring the consent holder to assess end-use sites for compost containing fly ash, considering soil type, rainfall, and proximity to water bodies. This could involve modelling leachate potential to ensure no exceedance of groundwater standards.
- **Monitoring Integration:** Expand the annual reporting (Condition 28) to include fly ash-specific monitoring in leachate (Point E) and receiving waters (Points A-D), testing for metals like As, B, Se, and Mo. If risks are elevated, consider prohibiting fly ash in composting unless demonstrated safe through field trials.

These measures would balance the benefits of fly ash (e.g., carbon sequestration potential and waste diversion) with environmental safeguards, promoting its use in land remediation where appropriate, such as stabilizing contaminated sites, while avoiding disposal-like applications that could lead to legacy contamination. Keeping in mind the application is starting with 50 t/yr but would likely grow over time (start as you mean to go on).

Other Suggestions for Consent Improvements

Based on my experience with similar operations, including beneficial reuse projects like RC02178 at Atarau, here are some additional recommendations:

1. **Approved Biomass Register:** Establish an appendix in the consent with a register of approved feedstocks, specifying types, sources (e.g., DAF sludge from a named supplier), and characterization data. This ensures consistency, as wastes like DAF sludge can vary by origin. New feedstocks or

volume changes (as per Condition 10) should require Council approval with risk assessments for odour, contaminants, and compliance history.

2. Waste Tracking and Transparency: Mandate a digital register (e.g., Excel with PDF backups) for all incoming materials, tracked via weighbridge dockets. This should record tonnages, origins, and dates, available for Council audits. Annual reporting should include mass balances to track material lifecycles, reducing loopholes in accountability and aligning with broader waste minimization goals under the Waste Minimisation Act 2008.

• **Soil Monitoring Enhancements:**

- If the consent application was intending to 'wholesale apply' biomass continuously to a specific site it would be a good idea to undertake annual monitoring of the soil.
- I see you have attached a list of soil analysis parameters from RC02178 which in turn came from work I did with Waikato Regional Council about 20 years ago that involved scientists from Land Care Research, SCION etc.
- While initially intended for biosolids application to land they have been used as a template that has permitted the application of a range of other (lower risk) products like paunch grass (yes this is slightly over kill but it keeps things consistent and is best practise).

3. While Annexure 1 and 2 provide a solid regime for leachate-applied areas, extend it to include baseline sampling before operations commence and annual composite sampling from high-application zones.

4. Animal Mortality Composting: If intended (as discussed), require small-scale field trials (e.g., 20 animals) over 2–3 years to demonstrate management of anaerobic conditions, odours, and leachate in the high-rainfall West Coast environment. Include contingency plans in the CSMP for wet weather.

5. CSMP and Review Frequency: Strengthen the Composting Site Management Plan (CSMP) (Condition 23) to include airborne spore/pathogen monitoring protocols (clearly define how they intend to monitor this). Biennial reviews are appropriate but add triggers for immediate review following complaints or non-compliance.

6. Nitrogen Management in Leachate: If compost is applied on-site beyond leachate, monitor for nitrogen bioaccumulation, accounting for multi-year releases (e.g., using frameworks from recent consents that model cumulative N loading). Ensure application rates consider readily available nitrogen (as noted) and incorporate modelling. Attached below is a screen shot of a new consent in Taranaki which covers the above well (issued in December 2025 for the application of paunch to land).

Hope the above suggestions are useful, see you on Thursday next week for a catch up on RC02178.

Cheers Joe

From: Tony Ridge <tr@wrc.govt.nz>

Sent: Wednesday, 28 January 2026 9:11 am

To: Joe Wildy <joe.wildy@outlook.co.nz>

Subject: Re: Composting project.

Hi Joe, thanks very much, this is the current draft and its annexures.

Kind regards

Tony Ridge

Senior Consents Officer | West Coast Regional Council

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