

Chairperson and Committee Members
GRANTS ALLOCATION COMMITTEE

16 NOVEMBER 2017

Meeting Status: **Public**

Purpose of Report: For Decision

RECOMMENDATIONS ON WASTE LEVY GRANT APPLICATIONS

PURPOSE OF REPORT

- 1 This report seeks approval for:
 - The allocation of funding for the current round of the Community Education and Projects Contestable Fund (Category 3).
 - Authority to invite applicants who submitted Expressions of Interests for Innovation: New Technologies and Seed Funding grants (Category 4) to submit full applications.

DELEGATION

- 2 The Grants Allocation Committee may make a decision under Section B.6 of the Governance Structure and Delegations:

“The Committee will consider and allocate grant moneys in accordance with the meeting cycles and criteria of five granting programmes, including the Waste Levy Fund grants.”

BACKGROUND

- 3 The Waste Minimisation Act 2008 requires operators of waste disposal facilities to pay a levy of \$10 per tonne of residual waste disposed of to landfill. Approximately half of this levy money is allocated by the Ministry for the Environment (MfE) to local authorities and must be spent on implementing their waste management and minimisation plans. The other half is allocated by MfE through the national Waste Minimisation Fund. Further information on solid waste and legislation is available in the report SP-10-871.
- 4 The Waste Levy Allocation Policy, approved by the Environment and Community Development Committee on 22 July 2010 and updated on 1 September 2011 (**Appendix A** attached to this report), sets out how the Kāpiti Coast District Council (Council) would spend part of this funding.
- 5 The overall objective of the Policy is:

To ensure optimal and transparent allocation of the national waste levy funding to waste minimisation projects.

To increase the range, scale and number of waste minimisation activities on the Kāpiti Coast through effective use of the waste levy fund.

- 6 \$20,000 is available for funding under Category 3 of the Waste Levy Allocation Policy: Community Education and Projects Contestable Fund, and \$50,000 is available for Category 4 of the Waste Levy Allocation Policy: Innovation: New Technologies and Seed Funding Contestable Fund.

ISSUES AND OPTIONS

Applications for Category 3 – Community Projects

- 7 Applications for Category 3 were called for in August 2017. Ten (10) applications were received, requesting a total amount of \$23,908.45. This means the fund is oversubscribed by \$3,908.45.
- 8 The applications were assessed against the criteria in the Waste Levy Allocation Policy. Some applicants were contacted by a Council staff member for clarification or to request further information. Following that process, three applications are recommended for full funding (Table 1) and six for part funding (Table 2). One application is recommended to be declined (Table 3). A brief description of each application is provided attached to this report (**Appendix B**). Full applications with follow-up correspondence are available as hard copies.

Table 1: Applications recommended for full funding

No	Applicant	Applied for	Amount
1	Energise Ōtaki Inc.	Shipping container, bike stands, tools for Green Bike project / Ōtaki Bike Library	\$4,798.00
2	Kenakena School	Classroom bins and a worm farm	\$895.91
3	Paraparaumu College	Materials to build a beach cleaning robot	\$4,347.83
	Total		\$10,041.74

- 9 All applications listed in Table 1 are well-aligned with the primary and secondary criteria of the fund and are therefore recommended for approval.

Table 2: Applications recommended for part funding

No	Applicant	Applied for	Requested	Recommended
4	Kāpiti Fresh Coop	4 sets of scales and 200 reusable produce bags	\$1,439.40	\$1,119.70
5	Māoriland Charitable Trust	Reduce waste generated at Māoriland Film Festival through a range of initiatives	\$3,265.00	\$3,015.00
6	Ōtaki Toy Library	Flyers, signage, bouncy castle & entertainment hire, hall hire, purchase of bubble machine and kids chairs and table	\$2,000.00	\$1,419.48
7	Paraparaumu Baptist Church	Materials to build plastic shredder and 3 other machines	\$3,000.00	\$1,100.00

No	Applicant	Applied for	Requested	Recommended
		for recycling plastic		
8	Rachel Benefield	60hrs to create online plastic free shopping guide for Kāpiti	\$2,400.00	\$2,200.00
9	Whaanau Collective	3 worm farms and 2 compost bins for communal garden hub	\$1,292.74	\$1,104.08
	Total Table 2		\$13,397.14	\$9,958.26
	Total Table 1			\$10,041.74
	Total funding recommended for allocation to community projects			\$20,000.00

- 10 The applications listed in Table 2 are recommended for part funding. While these applications also meet most of the criteria of the fund, the recommendations set out in Table 2 and sections 11 to 16 below aim to distribute the available funding fairly and in accordance with the intent of the grants, while enabling all of these projects to go ahead.
- 11 **Kāpiti Fresh Coop** has applied for \$1,439.40 to cover the costs of four new scales and 200 reusable produce bags. The recommendation is to fund the full cost of the reusable produce bags, and two of the four requested scales, which adds up to \$1,119.70. The reusable produce bags will create additional waste reduction on top of the business-as-usual and are therefore recommended to be fully funded. While it is recognised that the scales are essential to support the normal operation of the Coop, which in itself reduces waste by purchasing produce in bulk and thus avoiding packaging, the costs for these tools could be partly covered from membership contributions.
- 12 **Māoriland Charitable Trust** has applied for \$3,265.00 to fund a range of initiatives to reduce waste at the next Māoriland Film Festival. The recommendation is to fund all suggested initiatives, but only fund half of the quoted administration cost (\$500), which brings the total to \$3,015.00. The administration costs could be absorbed by the broader festival funding.
- 13 **Ōtaki Toy Library** has applied for \$2,000 to promote the toy library via new branding, as well as a 25th anniversary party. The recommendation is to fund all the proposed equipment purchases, but not the costs of the party entertainment. The proposed \$1,419.48 would cover the equipment purchases, as well as hall hire for the party.
- 14 **Paraparaumu Baptist Church** has applied for \$3,000 to build four machines enabling them to make new plastic products from their household's plastic recycling. The recommendation is to grant them \$1,100, which would cover the costs to build the first two machines (according to the higher cost estimate submitted by the applicant). This would allow them to get the project started and to test the viability and practical benefits. If this first half of the project proves successful, they could then apply for the remainder of the project cost next year, or source funding elsewhere for the remaining two machines.
- 15 **Rachel Benefield** has applied for \$2,400 to produce an online plastic free shopping guide for Kāpiti. It is recommended to contribute \$2,200, which would

still enable her to produce most of the guide while staying within available funding limits.

- 16 The **Whaanau Collective** has applied for \$1292.74 for two compost bins and three worm farms including worms. During past rounds of community grants, similar neighbourhood groups have usually been asked to contribute part of the costs of their projects themselves. The group has indicated that they would be able to contribute towards the costs of the compost bins and the worms. The recommended funding of \$1,104.08 would mean the group will have to cover \$188.66 themselves.

Table 3: Applications recommended to be declined

No	Applicant	Applied for	Requested	Recommended
10	Gorge Ltd	2 Hungry Bin worm farms	\$469.57	\$0

- 17 **Gorge Ltd.** has applied for \$540 (incl. GST) to purchase two Hungry Bin worm farms. They plan to contribute \$100 themselves. Gorge Ltd. runs the Gorge Café, and the worm farms would be used to process organic waste generated at the café and thus divert this waste from landfill. They plan to publicise this via a flyer and regular blog posts. While this is a great initiative to reduce the waste generated by the business, it cannot be considered a community project as there is no direct community participation or education or other benefits to the community. This application does not meet a sufficient number of the criteria of the fund, and therefore the recommendation is to decline it.

Expressions of Interest for Category 4 – New Technologies and Seed Funding

- 18 Expressions of Interest (EOIs) for Category 4 were called for in August 2017. Three EOIs were received, requesting a total amount of \$22,990 - \$32,990. This means the fund is undersubscribed.
- 19 Allocation of funds under Category 4 is carried out in a two-step process: At the first stage, applicants are invited to submit a brief Expression of Interest (EOI). Based on the EOI's fit with the grant criteria, selected applicants are invited to submit a full application (stage 2). Allocation of funding is then based on these full applications.

Table 4: Funding allocation process for Category 4: New Technologies and Seed Funding

Activity	Date
EOI submission deadline	29 Sept 2017
EOIs to go forward to full application stage selected	16 Nov 2016
EOI submitters notified of decisions	By 17 Nov 2017
Selected projects submit full applications	By 15 Feb 2018
Project selection made by the Council	March/April 2018
Applicants notified of results	March/April 2018

- 20 The EOIs were assessed against the criteria in the Waste Levy Allocation Policy. Following that process it is recommended to invite all applicants to submit full applications for their projects. A brief description of each application is provided in sections 21 to 26 below. Full applications are available as hard copies.
- 21 **Organic Wealth** has applied for \$10,000 - \$20,000 of seed funding (category B) to continue offering their “Save on Waste” consultancy service to businesses at a reduced cost / partly free. They received \$10,000 of Waste Levy Funding in 2016/17 to launch the programme on the Kāpiti Coast, and to offer businesses free waste audits and subsidised follow-up services. The goal of the programme is to help businesses reduce waste through recycling, and save money on waste disposal at the same time. So far they have worked with seven Kāpiti businesses to reduce their waste to landfill (see also report back in **Appendix E**).
- 22 Organic Wealth believe offering an extended round of free waste audits and subsidised additional services would firmly establish the “Save on Waste” programme in the Kāpiti district. They believe that by building up and promoting a variety of case studies they will be able to motivate other local businesses to follow suit and eventually fully fund their services.
- 23 Organic Wealth has previously received funding from the Waste Levy Grant totalling \$12,836 for three other projects between 2014 and 2016, these were an organic waste management project with an elderly care facility, an education programme for ECEs, and a food waste project with Ōtaki College.
- 24 **Silaca Glass Crushers Ltd.** has applied for \$6,500 of new technology funding (category A) to support the manufacture of soap containing crushed glass to act as a replacement for plastic microbeads. The funding would cover the production of a custom-made soap mould (\$4,000), a screening sieve (\$1,500), and packaging design (\$1,000). The recycled crushed glass they are planning to use for the soap is a by-product of a drymix concrete ingredient currently produced by Silaca Glass Crushers. The glass is sourced from Ōtaki transfer station.
- 25 **Laybys New Zealand Ltd.** has applied for \$6,490 of seed funding (category B), to purchase equipment for the production of building blocks from recycled glass. They conducted a trial with a concrete block manufacturer in Lower Hutt and found that the blocks met Building Code requirements. The amount applied for covers the purchase of a machine for the manual production of two blocks at a time (\$4,490) and a concrete mixer (\$2,000). The glass would be sourced from Ōtaki transfer station.
- 26 Both Laybys New Zealand Ltd. and Silaca Glass Crushers Ltd. are owned by Barry Lucinsky and operate out of a site they lease from Council adjacent to the Ōtaki transfer station. Both businesses have previously received funding from Council: Silaca Glass Crushers Ltd. have received a total of \$64,500 between 2011 and 2013 from the Waste Levy Fund and Clean Tech Fund for the set-up and automation of the glass crushing plant in Ōtaki, as well as for the development of a building product using crushed glass; Laybys New Zealand Ltd. has received \$40,000 to conduct a biosolids vermicomposting trial together with ESR in 2015 (see report back in **Appendix D**).
- 27 More information was requested on the applications from Silaca Glass Crushers Ltd. and Laybys New Zealand Ltd. At the time of writing this information had not yet been submitted. However, this should not preclude the applications from progressing to the next stage.

CONSIDERATIONS

Policy considerations

- 28 The applications and EOIs have been assessed against the criteria in the Waste Levy Allocation Policy 2011. Please refer to Appendix A for the objectives and requirements of projects under the Policy.

Legal considerations

- 29 There are no legal considerations for the Council. The applicants themselves are responsible for ensuring their activities comply with all relevant laws and regulations. The allocation and use of the funding will be subject to audit by the Ministry for the Environment.

Financial considerations

- 30 The recommendations for Category 3 result in a grand total of **\$20,000**. This means available funds would be fully allocated. There is no impact on rates funding, as these grants are funded from Waste Levy income.
- 31 Applicants are required to provide a bank account number before funds are released. This enables them to purchase goods directly. All applicants under Category 3 would be required to have made their purchases within twelve months of receiving the grant and submit proof of purchase. Unspent funds would be returned to the Council.

SIGNIFICANCE AND ENGAGEMENT

Significance policy

- 32 This matter has a low level of significance under Council policy.

Publicity

- 33 Selected projects will be publicised by the Council through media releases, the Council's sustainability newsletter 'On To It,' and other communication avenues. Several applicants have proposed to carry out their own publicity activities, e.g. through Facebook, organisation websites and newsletters, community and school newsletters, local radio, newspapers etc.

Other considerations

Updates from the 2016/17 and previous funding rounds

- 34 **Category 3:** In the 2016/17 financial year, a total of \$20,000 of funding was allocated to 18 projects through the Category 3 Fund. 13 of the funded groups have reported the successful completion of their projects, while the remaining five groups have yet to implement final project stages. Most of them plan to complete their projects by the end of the calendar year. The project reports submitted by funding recipients are summarised in Appendix C.
- 35 **Category 4:** In the 2014/15 funding round Laybys New Zealand Ltd. was granted \$40,000 ex GST to conduct a biosolids vermicomposting trial in Ōtaki

together with the Institute of Environmental Science and Research (ESR). This trial is now completed. The report back is attached as **Appendix D**.

36 In the 2016/17 funding round, the following projects received funding under category 4 of the grants:

- Kāpiti Biodiesel Cooperative - \$15,000 to set up a small-scale biodiesel plant
- Organic Wealth - \$10,000 for Save on Waste project (see interim report in Appendix E)
- Nufuels Ltd. – \$25,000 to test co-pyrolysis of plastic bags and tyres

These projects are currently still underway.

RECOMMENDATIONS

37 That the Grants Allocation Committee allocates levy funding under Category 3 of the Waste Levy Policy 2011 as set out in **Tables 1 and 2** of report IS-17-340, totalling **\$20,000**.

38 That all three applicants that submitted Expressions of Interest under Category 4 of the Waste Levy Policy 2011 as described in sections 21 to 26 are invited to submit full applications.

Report prepared by

Approved for submission

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ATTACHMENTS

Appendix A: Waste Levy Allocation Policy 2011

Appendix B: Summary of applications for 2017/18 Category 3 grants

Appendix C: Summary of reports from successful applicants 2016/17 Category 3 grants

Appendix D: Report back biosolids vermicomposting trial (2014/15 Category 4 grants)

Appendix E: Interim report back from Organic Wealth (2016/17 Category 4 grants)

Waste Levy Allocation Policy¹

2 September 2011

Objectives of the Policy

To ensure optimal and transparent allocation of the national waste levy funding to waste minimisation projects.

To increase the range, scale and number of waste minimisation activities on the Kāpiti Coast through effective use of the waste levy fund.

This Policy supports the Council's zero-waste strategy for waste management. It gives effect to the requirements of the Waste Minimisation Act 2008 to allocate waste levy funding received from the Ministry for the Environment for waste minimisation projects.

Waste Levy Allocation Process

- the Environment and Community Development Committee will review and approve the broad framework or categories for allocation of the funds. This will be reviewed on a three-yearly basis as part of the LTP process.
- the Environment and Community Development Committee will approve the indicative allocation of funds with a three year timeframe and review this allocation annually as part of the formal considerations under the Annual Plan/LTP process.
- the Environment and Community Development Committee will approve the criteria for any contestable process used in the allocation of funding.
- Approval of funding under any contestable process will be undertaken by the Waste Levy Grant Allocation Sub Committee. The sub-committee consists of the Chair of the Committee, the Chair of the Corporate Business Committee, the Mayor, and two Community Board members.

Framework for Allocation of the Waste Levy

- The categories for high level allocation of the waste levy fund are:
 1. Waste Flows: Data Collection

To improve the quality and usefulness of data about total waste volumes and waste streams, and movement of waste within, into and out of the District, as a key input into waste minimisation decisions.
 2. Minimisation Incentives: Contracts

To achieve continual improvement to contract documentation to maximise incentives for waste minimisation by waste operators and service providers.

¹ This policy is included in the (draft) Wellington Regional Waste Management and Minimisation Plan 2011, in the Kāpiti Coast District Council action plan.

3. Community Education and Projects

To achieve a high level of community involvement in practical on-the-ground waste minimisation projects which encourage a network of community participation and long term action.

4. Innovation: New Technologies and Seed Funding

To encourage the establishment of waste minimisation businesses on the Kāpiti Coast and maximise opportunities for minimisation and economic development through innovative processes and technologies.

- allocation of funding for Categories 3 and 4 will be via an annual contestable process which calls for expressions of interest to identify potential recipients from the fund.

Category 3: Community Education and Projects Contestable Fund

- the criteria for assessment of applications to the Community Projects fund (Category 3) are:

Minimum requirement:

- the project will lead to long term waste minimisation actions by participants;
- the project has a minimum involvement of either 5 households linked to the project or involves businesses or organisations active around waste minimisation; and
- details are provided on the costs of the project and how the contribution sought from the levy fund will be used.

Other criteria:

- there is a level of involvement of young people in the project ;
- the project involves skills and knowledge within the community about waste minimisation and/or reducing the need for waste;
- the project proposal shows how success will be measured in terms of waste reduction and skills learnt.

Category 4: Innovation: New Technologies and Seed Funding Contestable Fund

- funding for projects under this process will be for up to three years and no more;
- any agreement to provide funds for more than one year will be treated as a contract for service rather than a grant and recipients will be required to provide a performance report;

- funding for new technology initiatives would be provided for technology feasibility and proof of technology (including economics) stages only;
- criteria for the assessment of applications under this contestable process will be:

A. For new technology proposals:

- a proposal that includes:
 - description and/or proof of a unique Intellectual Property (IP) contribution;
 - a programme and process for testing
 - a programme for business development of the end product/results of the project/trial
 - indication of other funding contributors.

B. For businesses using proven existing technologies and processes:

- a business case is provided which includes:
 - evidence that access to necessary waste streams is secured;
 - assumptions around waste stream costs, projected revenue, current and projected operating costs and end-use markets
 - *review and (independent) sign off on one or more assumptions can be required by Council*
 - provision for contingencies and structured response to rising waste resource costs and/or end-use market failure;
 - *review and (independent) sign off of this information can be required by Council.*
- estimates of performance post Council or other subsidy;
- estimates of the scale and performance of the project in terms of waste minimisation;
- clear indication of benefit to the local economy and/or regional economy.

This policy was approved by the Environment and Community Development Committee on 2 September 2011. Refer Report IS-11-312.

Summary of Applications for 2017/18 Category 3 Grants

- 1 **Energise Ōtaki Inc.** has applied for \$4,798 to purchase a shipping container (\$4200 purchase and fit-out), tools (\$350), and bike stands (\$248) for their Green Bike Project. The project refurbishes old bikes destined for landfill or scrap metal with the help of volunteers and students from Ōtaki College. So far, bikes have then been given away to members of the community, although the group is looking at transitioning to a bike library system, like the one that is successfully operating in Paekākāriki. The project addresses the 'reuse' stage of the waste hierarchy, as bikes are fixed and brought back into use rather than disposing of them to landfill or as scrap metal. The shipping container will house the workshop where bikes are refurbished and temporarily stored, and Energise Ōtaki plan to continue to involve students from Ōtaki College, and also draw in volunteers and budding bike mechanics from other schools and community groups.
- 2 **Gorge Ltd.** has applied for \$540 (incl. GST) to purchase two Hungry Bin worm farms. They plan to contribute \$100 themselves. Gorge Ltd. runs the Gorge Café, and the worm farms will be used to process organic waste generated at the café and thus divert this waste from landfill. They plan to publicise this via a flyer and regular blog posts.
- 3 **Kāpiti Fresh Co-op** has applied for \$1439.40 to purchase 4 sets of scales (\$159.85 each) and 200 reusable produce bags (\$800). The co-op reduces waste by purchasing fresh produce in bulk, which means the produce comes with less packaging. Introducing reusable cloth bags to be used instead of paper or plastic bags will reduce their waste even further. They are planning promotion to increase their membership and are applying for the grant so they don't have to impose higher costs on members to cover the costs for scales etc.
- 4 **Kenakena School** has applied for \$895.91 for 50 classroom bins and a worm farm. Driven by the school council and a group of year 5/6 students, Kenakena School has recently set the goal of establishing a zero waste policy at the school, and of creating life-long waste reduction habits for the children and their families. To achieve this goal, they will add two new bins (two different colours) to each classroom, so that each classroom has a bin for paper, other recyclable items, food waste and non-recyclable waste. The worm farm will be used to process the collected food waste. In parallel, the school is also promoting the use of "nude food" lunchboxes through a student-driven initiative. They aim to reduce the volume of waste sent to landfill each week via their skip.
- 5 **Māoriland Charitable Trust** has applied for \$3,265 to reduce waste generated during the Māoriland film festival. They plan to achieve this through a range of education and promotion initiatives, including workshops and a window display at the Māoriland hub, social media, etc. Initiatives will include:
 - Promotion of reusable take-away coffee cups and water bottles
 - Encouraging festival attendees to take their rubbish away with them
 - Developing an eco-footprint calculator for attendees
 - Placing bins around town for optimal recycling
 The amount applied for is intended to part-fund the following items: administration of the project (\$500), four hungry bin worm farms to compost organic waste from the festival and from other events at the Māoriland hub (\$1,300), four workshops (\$400), signage (\$650), a water tank to refill water

bottles (\$500), and wages for bin monitors (\$1000). The Māoriland Charitable Trust will cover the remaining costs for these items (total project cost \$4,350)

- 6 **Ōtaki Toy Library** has applied for \$2,000 to market the Ōtaki Toy Library, which will include a 25th anniversary party, and aims to increase the number of members and volunteers at the toy library. More broadly, the goals of the toy library are to reduce the amount of toys being bought and then going to landfill after a relatively short period of time (either because they were cheap plastic toys that break easily, or because children lose interest), while also giving children access to good quality, interesting toys. The intention of the anniversary party is to raise awareness of the toy library in the community and increase membership. The amount applied for is intended to cover: promotional flyers (\$256), a new sign and banner (\$343.85), hall hire for the party (\$203.55), bouncy castle hire (\$189.75), face painting (\$230), sausages (\$57.50), kids' tables and chairs (\$365.19) and a bubble machine (\$250.88), which will be used at the party and then become part of the hire stock of the toy library, and a magician for the party (\$230).
- 7 **Paraparaumu Baptist Church** has applied for \$3,000 to build four machines to enable the community to recycle their own waste plastics, and turn them into a range of useful products. The concept and blue prints for the machines have been developed in the Netherlands, and are available online for anyone to copy (see <https://preciousplastic.com/en/>). The machines are a shredder to shred the waste plastic so it can be fed into the other machines, which are an extruder, an injection moulding machine and a compression moulding machine. The group plan to use used/recycled parts wherever possible, and estimate the build cost for each machine to be \$300-\$600 (depending on how many new parts and how much specialised labour they have to purchase). The remaining funds will be used to create moulds for the injection and compression moulding machines, containers and shelving for storage, and potentially a trailer to take the machines to local schools.
- 8 **Paraparaumu College** has applied for \$5000 (incl. GST) to cover costs for parts and materials to build a beach-cleaning robot. This is a project of senior robotics students to be undertaken next year. The robot will be designed to autonomously clean a section of beach the size of an Olympic swimming pool of pieces of rubbish between the size of a bottle cap and up the size of a 3l milk bottle. If the students' design of the robot is successful, this may lead to others picking up the project and refining the design of the robot further. The students will be required to document the design and build process so that any third party can reproduce the robot. This documentation will be made freely available online. The goal is to reduce the amount of litter on beaches and the resulting ocean pollution. The College has previously received \$2,300 (incl. GST) of funding from the Waste Levy Fund for recycling bins in 2015/16.
- 9 **Rachel Benefield** has applied for \$2,400 to produce an online plastic free shopping guide for the Kāpiti Coast. The funding will cover 60 hours of her time for research, writing and networking to produce the guide. Rachel has been living plastic packaging free with her family for the last six months, and she is passionate about empowering others to live plastic packaging free too. Once produced, she intends to share the guide widely via parenting pages, facebook, through school networks, the Council etc.
- 10 **The Whaanau Collective** has applied for \$1292.74 for three worm farms and two compost bins. The Whaanau Collective is a group of five households. They

are planning to set up a communal garden in one of the group member's backyards. The compost bins and worm farms will be part of the communal garden and will be used to process the food waste from the five households, while also supplying fertiliser for the garden. The group have conducted a waste audit and are planning to conduct another one in a few months to measure how much their food waste to landfill has reduced through the project.

Summary of reports from successful applicants of 2016/17 Category 3 grants

Full reports including photos are available on request.

- 1 **Capital & Coast DHB** was granted \$336.50 for a worm farm. They have not yet implemented their project.
- 2 **Educare Kāpiti** was granted \$495 for a worm farm and worms. After revising their quotes, they claimed only \$445. They set up their worm farm in September 2017 and have started diverting food scraps and paper towels from landfill.
- 3 **Greenown+ Greener Neighbourhoods Group** was granted \$443 to purchase four worm farms and eight weed digester bags for seven households. The goal was to divert food scraps and greenwaste from landfill, and/or manage it at home instead. The households involved reported a reduction of their waste to landfill, and also measured a reduced environmental footprint through the Greener Neighbourhoods programme.
- 4 **Kāpiti Primary School** was granted \$287.50 for a worm farm. In conjunction with the new worm farm, they have set up worm bins in every classroom, which are collected by student monitors every day. As a result, they have been able to reduce the number of bins throughout the school. The worm farm initiative has also motivated the school to look at their waste systems more broadly, and they have now also set up a system for paper and plastic recycling. Through these combined initiatives they have seen a significant reduction of waste volumes to landfill, managed to reduce rubbish collection costs, and grown environmental awareness of students and staff.
- 5 **Ōtaki College** was granted \$692.20 to build a recycling sorting and storage station. They have purchased all materials needed and are planning to complete the project before the end of the year.
- 6 **Ōtaki Kindergarten** was granted \$653.50 for a worm farm and compost tumbler. After reviewing their quotes, they only claimed \$591.50. The worm farm and compost tumbler are enabling them to divert most of their organic waste from landfill: food scraps (about 1/8 of a bucket daily) are processed using the worm farm, while waste from their rabbits and chooks and paper towels (about half a bucket daily) are composted using the compost tumbler. The kids are involved in maintaining and emptying both systems.
- 7 **Ōtaki Playcentre** was granted \$1,840 to construct two keyhole gardens with compost in their centres. They have been weighing their food scraps going into the new compost set-up with the children for four months, showing that they are now composting between 200g and 1kg of food scraps per day, which would have otherwise gone to landfill. The children have also learned about waste and nutrient cycles and have been involved in planting up the keyhole gardens.
- 8 **Ōtaki Pounamu Greener Neighbourhoods Group** was granted \$2,000 to build a shared chicken coop and duck enclosure, and to purchase worm farms for group use. They have yet to implement final stages of the project, but hope to divert 10l of food waste per day once all systems are set up.
- 9 **Paraparaumu Beach School** was granted \$1,884.50 for classroom recycling bins and outdoor recycling bins. The school has not yet implemented the project, as they wanted to carry out further investigations into their waste first to see what configuration of bins would suit them best. In early September, a Year 5/6 class conducted a waste audit of the school with the help of Council's Waste

Minimisation Officer. The results will inform the implementation of the project, which is planned to be completed before the end of the year.

- 10 **Raumati Beach Kindergarten** was granted \$773 for two worm farms. They have been using the worm farms to educate their kids about worms and what they can eat, as well as learning to use scales and record numbers. They have recorded an average of 859.4 grams of waste being put into the worm farms instead of the rubbish bin every day, which adds up to about 17.2kg a month. An added benefit is that they are now selling the collected worm tea to the families.
- 11 **St Patrick's Primary School** was granted \$391 for two compost bins. They have not yet implemented their project, but plan to do so by the end of the calendar year.
- 12 **Te Rito o Te Kura Charitable Trust** was granted \$2,249.33 to purchase sewing equipment to make reusable lunch wraps and shopping bags for the school. So far they have held four working bees with students, parents and teachers, where they sewed 60 sandwich bags and 40 fruit bags. They plan to make a further 40 sandwich bags in Year 7/8 sewing classes. The sandwich bags and fruit bags were distributed among students at the school. The school is planning further working bees to make reusable shopping bags from upcycled materials.
- 13 **Waikanae Be Green Greener Neighbourhoods Group – 2 projects:**
Waikanae Be Green were granted \$290 for repairs and maintenance of an existing community mulcher, and \$928.94 to purchase six worm farms and three compost bins for seven households. Both projects were successfully implemented. Households now divert between 6l and 16l of food waste per month each.
- 14 **Whitireia New Zealand Kāpiti Campus** was granted \$2,401.02 to purchase 59 bins in order to set up a recycling system throughout the campus. They estimate that through this initiative, their waste to landfill has reduced by one third, while the total cost of rubbish collection has reduced by two thirds. Feedback from staff and students has been positive.
- 15 **Raumati Beach School** was granted \$997.50 to upgrade their existing worm farming system by adding additional worm farms. They have yet to implement their project.
- 16 **Raumati South School** was granted \$3,754.03 to purchase three additional worm farms and 22 sets of classroom recycling bins. The new system has been set up and is working well.
- 17 **The Pineapple Project** was granted \$2,582.98 for a community music and theatre event to raise awareness of attitudes towards waste and the environment. The event commenced with four pirate-themed family beach clean-ups across the district, collecting a total of 13 rubbish bags full of rubbish. This was followed by a holiday programme for children, creating set pieces from found rubbish. The event itself took place in February 2017 as a mini eco-festival with a range of environment-themed performances. The organisers felt the event was successful in raising awareness of waste issues and encouraging waste reduction behaviours.

Report back: Biosolids vermicomposting trial

Laybys New Zealand Ltd. was granted \$40,000 in the 2014/15 round of Innovation and Seed Funding Waste Levy Grants to conduct a biosolids vermicomposting trial, together with the Institute of Environmental Science and Research (ESR). The trial was conducted adjacent to the transfer station site in Ōtaki. This trial is now complete and the report back from Jaquie Horswell of ESR is attached below.

Around 1,500 tonnes of dried biosolids from the Kāpiti Coast are disposed of to landfill each year. This trial investigated the potential for vermicomposting (worm composting) these biosolids, using recycled plasterboard (GIB®) as a bulking agent. Vermicomposting with biosolids and plasterboard had not previously been trialled in New Zealand.

There were some significant initial teething problems (the worms died or tried to escape the trial) due to excess ammonium levels and problems with re-wetting of the dried biosolids. The trial units were then adjusted using differing mixes and methodologies, and the worms survived and multiplied.

After 12 weeks of vermicomposting the process was complete and the results are summarised below:

- The addition of plasterboard appeared to enhance the vermicomposting process
- There was plenty of soluble nitrogen in the final product to satisfy plant needs – earthworms stimulate nitrification
- Ammonium levels were still high due to high nitrogen in starting material (biosolids)
- The phosphorous content is similar to animal manure composts
- All mixtures trialled met the NZ Biosolids guideline levels for *E. coli* (< 100MPN/g)
- To meet guidelines levels for zinc and copper the biosolids must be diluted

The finding that the addition of plasterboard to the mix appeared to positively impact the vermicomposting process is significant. Co-vermicomposting biosolids with a plasterboard bulking agent has the potential create a viable product and allow diversion of biosolids and some plasterboard waste from landfill.

This was a successful outcome and added to the learnings taken from the recent BioBagga biosolids composting trial. The learnings from this vermicomposting trial are being incorporated into the Collective Biosolids Strategy for the Lower North Island that our Council is part of and will help inform our long term biosolids disposal strategy. The researchers from ESR who conducted the vermicomposting trial are now involved in further trials of different methodologies in the Manawatu, which will also inform the Collective Biosolids Strategy. Thus the vermicomposting trial is contributing to a larger piece of work which will enable the Councils of the Lower North Island to select the most suitable biosolids treatment method for our region. An information flyer about this project is attached.

PILOT SCALE TRIAL TO INVESTIGATE FEASIBILITY OF CO-VERMICOMPOSTING KĀPITI'S BIOSOLIDS WITH PLASTER BOARD

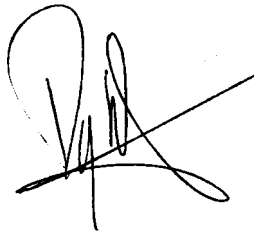
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THE SCIENCE
BEHIND THE
TRUTH

PILOT SCALE TRIAL TO INVESTIGATE FEASIBILITY OF CO- VERMICOMPOSTING KĀPITI'S BIOSOLIDS WITH PLASTER BOARD

PREPARED FOR:	Kāpiti Coast District Council
CLIENT REPORT No:	FW 17011
PREPARED BY:	Dr Jacqui Horswell
REVIEWED BY:	Dr Alma Siggins

Manager



Wim Nijhof

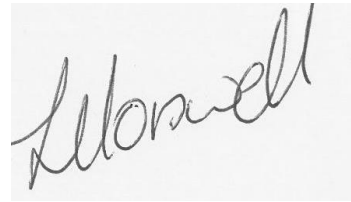
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Dr Jacqui Horswell

DISCLAIMER

The Institute of Environmental Science and Research Limited (ESR) has used all reasonable endeavours to ensure that the information contained in this client report is accurate. However ESR does not give any express or implied warranty as to the completeness of the information contained in this client report or that it will be suitable for any purposes other than those specifically contemplated during the Project or agreed by ESR and the Client.

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EXECUTIVE SUMMARY

Each year, 1500 tonnes of thermal dried biosolids from the Kapiti Coast are disposed of at the Silverstream landfill. Funded by a Waste Minimisation Grant, this study investigated the potential for vermicomposting these biosolids, using recycled plasterboard (GIB®) from the building industry as a bulking agent.

Construction and demolition waste (including plasterboard) currently account for 20% of waste going to landfill. Plasterboard is theoretically suitable for vermicomposting, as it is composed of gypsum with a paper lining and has the potential to balance the C:N ratio, absorb excess water, aerate the compost and reduce the ammonia smell from biosolids. In addition, as a final product, gypsum can be used as a soil amendment in agriculture to improve permeability in clay soils and provide calcium and sulphur for plant growth.

Vermicomposting with biosolids and plasterboard has not previously been trialled in New Zealand.

There were some significant initial teething problems encountered in the trial due to excess ammonium levels and problems with re-wetting of the biosolids pellets. To find a solution, small scale laboratory tests were carried out to find optimum composting conditions and a mixture that the worms liked. The field trial units were then adjusted and the worms survived and multiplied. After 12 weeks the vermicomposting process was complete. The results are summarised below:

- The addition of plasterboard appeared to enhance the vermicomposting process.
- There was plenty of soluble N in the final product to satisfy plant needs – earthworms stimulate nitrification.
- Ammonium levels were still high due to high N in starting material (biosolids)
- The Phosphorous content is similar to animal manure composts
- All mixtures trialled met the NZ Biosolids guideline levels for *E. coli* (< 100MPN/g)
- To meet guidelines levels for zinc (Zn) and copper (Cu) the biosolids must be diluted.

The finding that the addition of plasterboard to the mix appeared to positively impact the vermicomposting process is significant. Co-vermicomposting biosolids with a plasterboard bulking agent has the potential create a viable product and allow diversion of biosolids and some plasterboard waste from landfill.

1. INTRODUCTION

1.1 PROJECT AND CLIENT

Kāpiti Coast District Council through Laybys NZ have contracted The Institute of Environmental Science and Research (ESR) Ltd to test the viability of co-vermicomposting two wastes currently disposed of to landfill: Kāpiti Coast waste water treatment plant solids and construction waste plasterboard (gypsum, GIB®).

1.2 BACKGROUND

The Kāpiti Coast produces an average of 1,500 tonnes of dried biosolids on an annual basis which is currently disposed at the Silverstream landfill. In addition, a significant waste for the region is construction plasterboard. It is estimated that construction and demolition waste may represent up to 20% of waste going to landfill. Winstone Wallboards Ltd (a major producer of GIB) have expressed an interest in exploring vermicomposting as an alternative to landfilling construction waste GIB®.

Landfilling of wastes with potential beneficial re-use options runs contrary to the thrust of current legislation (Waste Minimisation Act (2008), NZ Waste Strategy (2002)), and to international environmental policy (Danish Waste Strategy (2005-2008)) and increased community awareness of, and support for waste minimisation (e.g. Zero Waste initiatives).

This trial will investigate the feasibility of re-using two significant wastes, biosolids and GIB, and producing a nutrient rich fertiliser with potential economic opportunities.

Vermicomposting has been found to be a viable option for transforming organic waste such as biosolids into useful, nutrient rich compost. During the vermicomposting process organic matter is decomposed by earthworms and microorganisms, stabilising the substrate and mineralising nutrients. A diverse range of feed stocks can be used and providing certain parameters are maintained this is a cost effective and fairly rapid treatment compared to standard composting.

Vermicomposting of biosolids is a commonly used waste management strategy both in New Zealand and overseas. What is NEW and INNOVATIVE is testing the viability of the processing using dried biosolids and construction plasterboard.

1.3 OBJECTIVES

- Determine if Kāpiti Coast biosolids produced at the Paraparaumu Wastewater Treatment Plant can be co-vermicomposted with waste plasterboard.
- Determine the parameters for effective vermicomposting.

2. METHODS

2.1 MATERIALS

- Plasterboard (Fig. 1), was sourced from Winstone Wallboards and crushed to 5 mm for consistency purposes during sampling.
- Greenwaste (domestic garden waste containing mostly lawn clippings and weeds) was sourced from the Ōtaki Transfer Station and was also chipped to 5 mm (Fig 1).
- Biosolids were sourced from the Paraparaumu Wastewater Treatment Plant (PWWTP).

Biosolids are produced at the treatment plant by undergoing primary and secondary treatment before being separated from the effluent or liquid component of the waste. The biosolids are then dewatered and thermally dried. It is the thermally dried product that was be used for this trial.

Samples of all three source materials were analysed for carbon: nitrogen ratio and moisture content prior to establishment of the experiment in order to determine correct ratios. Ammonia concentrations were also determined for the biosolids.



Figure 1. Crushed plasterboard and greenwaste

2.2 PRELIMINARY TRIALS - WORM SURVIVAL TESTS

Two preliminary trials were established. This first preliminary trial was required as biosolids may contain ammonia levels that are toxic to worms (Chan & Griffiths, 1988).

Firstly, treatments of biosolids with plasterboard and biosolids with greenwaste were set up in triplicate in plastic containers in the laboratory at ESR (Fig 2). These containers were given air holes and drainage. Water was added to all containers to establish a moisture content of 75 %. Worms were added to the surface of each treatment (density of 1.63 kg m²) (Ndegwa & Thomson, 2000) and left to vermicompost at room temperature in a fumehood at 18 °C.

In the second of the preliminary experiments, the C:N ratio of the mixtures was adjusted to 25 by adding chipped cardboard. The containers were left to pre-compost for four weeks after which the worms were added. Worm survival was determined after set periods of pre-composting to determine how long it will take for ammonia levels to decrease to a level that is no longer toxic to the worms.



Figure 2. Preliminary laboratory trials

2.3 SITE AND SET UP

2.3.1 Pilot Plant Design

Location: The trial vermicomposting plant was situated on a 200m² area in a paddock next to the Ōtaki Resource Recovery Centre, 1 Riverbank Road, Ōtaki on the land leased by Silaca Glass Crushers. The location of the trial at the Silaca Glass Crushers site is illustrated in Fig 3.

Ōtaki Resource Recovery Centre

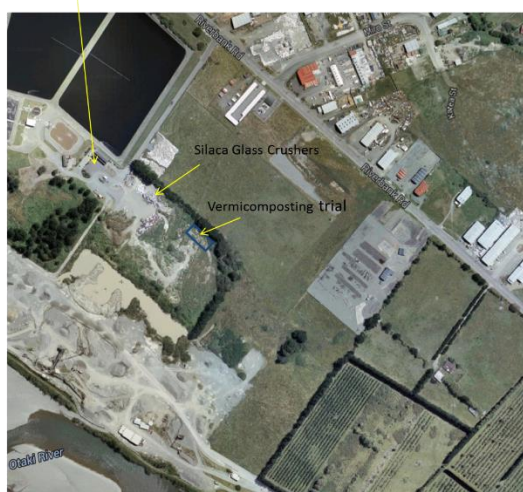


Figure 3. Location of vermicompost trial at Silaca Glass Crushers site adjoining the Ōtaki Resource Recovery Centre.

The trial was set up at the Ōtaki Refuse Transfer Station, located behind a line of trees that gave partial shading throughout the day. The vermicomposting units were covered but still

susceptible to variations in daily temperature (Fig 4). The average annual temperature in Otaki is 13.4°C, however over the February to May period of this trial, historical averages show a range from 12 °C to 18 °C daily averages (Climate-Data.Org).

Duplicate vermicomposting units of two difference ratios of biosolids with plasterboard, and duplicate units of biosolids with greenwaste (control) were established (Fig 5-6). Each treatment replicate was in a sealed plastic trough-shaped 1 m³ container. Each container was fitted with a tap and leachate collection container to allow for drainage. All units were filled manually and once established, adjusted to 75 % moisture content. Worms (*Eisenia fetida*) were added to the surface at a density of 1.63 kg m⁻².



Figure 4. Vermicompost container on the Layby NZ site

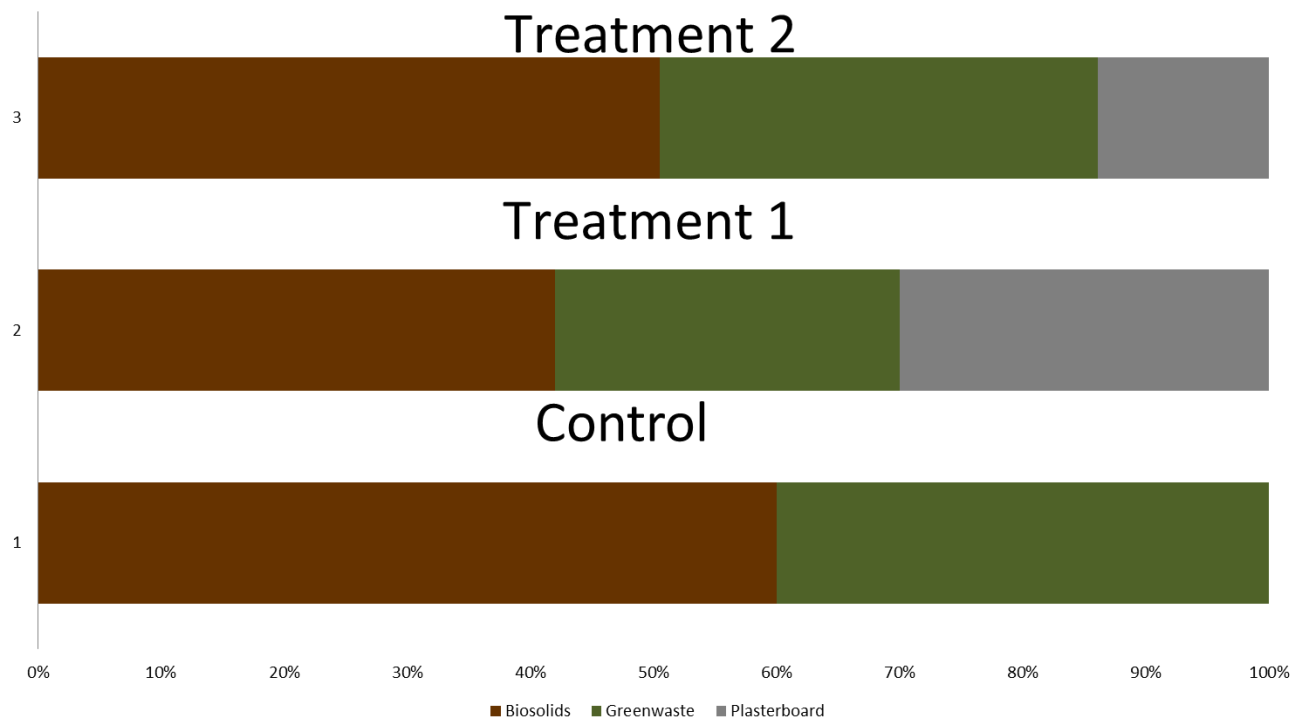


Figure 5. Ratios of material in each vermicompost treatment (Control, T1 = 10% GIB; T2 = 30% GIB)

Control

Treatment 1

Treatment 2



Figure 6. Vermicompost mixtures at the beginning of the trial (Control, T1 = 10% GIB; T2 = 30% GIB)

2.3.2 Sampling

A suite of variables were monitored to determine when the vermicomposting process was complete. Sampling occurred every four weeks at WK 0, WK 4, WK 8, WK 12 (time in weeks), with the first samples taken immediately after establishment of the trail to provide baseline data. Samples taken from each of the six vermicomposting units were analysed for the following:

- dehydrogenase,
- phosphate,
- nitrate,
- ammonia;
- and *Escherichia coli*

Completion was assessed based on a decrease in biological activity (dehydrogenase), *E.coli*, phosphate, ammonia and an increase in nitrate (Van Schaik et al., 2012).

Weekly sampling was undertaken for maintenance purposes and included moisture content and pH analyses. Adjustments were made by adding water or calcium carbonate if required. The final sampling at WK 12 included a wider suite of analysis to determine if the vermicompost met Grade Aa of the current NZ Biosolids guidelines (NZWWA, 2003).

3. RESULTS AND DISCUSSION

3.1 PRELIMINARY TRIALS - WORM SURVIVAL TESTS

In the preliminary trials, within 24 hours worm mortality was 100 % in all treatments. The worms were found either balled up in a corner or trying to escape by climbing the walls of the tubs. There are a few factors that contribute to worm mortality in sewage sludge composting including low pH, high ammonia levels (worms prefer < 500 ppm; Edwards, 1998) and high temperature, all properties that are problematic in composting biosolids (Gunadi et al., 2002). Baseline analysis showed that nitrate levels in the treatments ranged from 1800 – 3400ppm, above the preferred levels for worms (Fig 9). Chan & Griffiths, (1988) also found 100 % worm mortality in the first 24 hours when using untreated pig manure with no pre-composting. The study later determined that the addition of calcium sulphate to control the ammonium level in the pre-composting process created an environment acceptable to worms. As calcium sulphate is the main component in plasterboard, we may see similar results when the treatments are given time to pre-compost.

In addition to the high ammonium content of the biosolids, it was also noted that the biosolids pellets did not re-hydrate. Despite adding green waste to balance the C:N ratio, this was still below the level of 25 recommended for optimum for worm activity (Ndegwa and Thompson, 2000).

In the second set of laboratory trials, more cardboard was added to increase C:N ratio and the material was saturated with water and then allowed to drain in an attempt to re-wet the biosolids pellets to make them more palatable for the worms. Issues identified and the solutions are summarised in table 1 below.

Table 1. Issues encountered in the preliminary laboratory trials and solution.

Problem	Consequence	Solution
High ammonia	Worm death	Pre-composting period
Biosolids pellets difficult to re-hydrate	Worms leave	Add more water, soak, mix well
C:N ratio	Worms leave	Add cardboard

Two days after set up of the second laboratory trials, the distribution and activity of the worms was far different to the first experiment (where the worms either died or tried to escape). No worms were trying to escape, nor were they remaining balled up in their original soil ball. Rather they had spread out across the tub and were very active. After three days the worms appeared to be processing the material and worm casts were visible. The experiment was continued until the material appeared to be well composted (Fig 7), a duration of approximately three months.



Figure 7. Treatments T1 and T2

3.2 PILOT FIELD TRIAL

Following the results from the laboratory experiments the field trial vermicompost mixtures were readjusted as follows:

- All units were mixed thoroughly,
- Approximately half of the vermicompost from each unit were removed and disposed of to make room for cardboard,
- The leachate holes were blocked off with tape and each unit was filled with water. No exact volume was used but rather each unit was filled until ponding occurred and all material had been wetted,
- Units were left overnight to soak,
- Drainage holes were unblocked and the compost was well mixed again, weighed and cardboard was then mixed in thoroughly by hand with spades, and
- The worms were added at the correct ratio.

Due to the limitation of shredding cardboard, only a total of 11 kg of cardboard was used and therefore a C:N ratio of 25 was not achieved. Table 2 shows the ratios used:

Table 2. C:N ratio of the final vermicompost mixture in each unit and treatment

Sample	Cardboard (wet w kg)	Compost mixture (kg)	C:N ratio
Control rep 1	1	25	10.05
Control rep 2	2	51	10.02
10% GIB rep 1	2	51	9.96
10% Gib rep 2	2	51	10.07
30% GIB rep 1	2	51	10.02
30% GIB rep 2	2	51	10.08

During the weekly maintenance, it was noted that the worms were surviving and were very active. After 12 weeks the worms began to try to leave the units. This was an indication that the condition in the the units were no longer optimal for the worms – at this point it was assumed that the worms had run out of food and therefore the composting was complete.

3.2.1 Dehydrogenase

The dehydrogenase data was highly variable and has therefore been excluded from this report.

3.2.2 Ammonium, nitrate and phosphorous

Figures 8, 9 and 10 show the ammonium, nitrate and phosphorous content of the vermicompost over the 12 week experimental period.

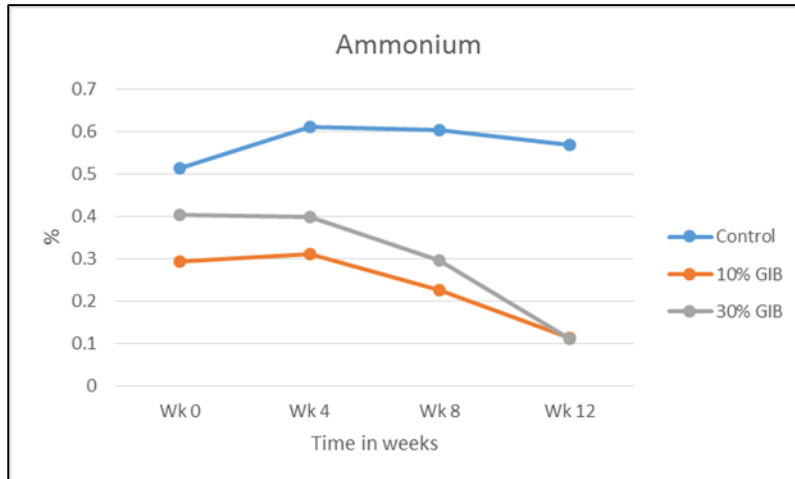


Figure 8. Ammonium content of vermicompost treatments

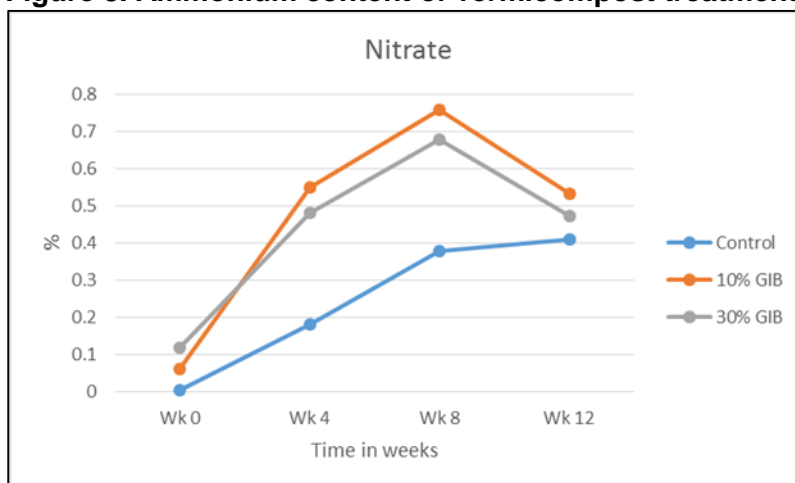


Figure 9. Nitrate content of vermicompost treatments

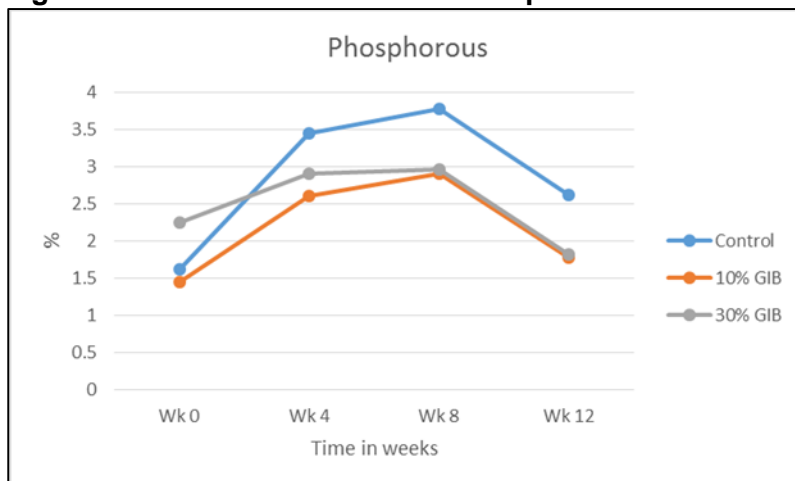


Figure 10. Phosphorus content of vermicompost treatments

Over the course of the experiment the ammonium concentration decreased rapidly in the two treatments containing plasterboard (Fig. 8). The loss of ammonium during vermicomposting is well documented (Atiyeh et al., 2000; Benitez et al., 1999; Aira and Dominguez, 2009). Atiyeh et al. (2000) found a large decrease in ammonium during the first 28 days of vermicomposting and reported that earthworms caused, at least initially, a more rapid loss of that action compared to the treatment without earthworms. In this study the ammonium loss in the control without plasterboard was notably slower. It therefore appears that plasterboard has a positive impact on the vermicomposting process. The main component of plasterboard is calcium sulphate. A previous study by Chan and Griffiths (1988) found that worms fed untreated pig manure died within 24 hours, likely due to the high ammonium content. We tried a pre-composting step but this did not work. The addition of calcium sulphate however allowed the worms to live and burrow in the pig slurry. The addition of plasterboard may also reduce the toxicity of the high Cu and Zn which may be impacting biological processes such as nitrification. The plasterboard may also provide more aeration to the compost thus improving the conditions for the worms.

At the end of the experiment the ammonium level was still high, this was due to the high starting levels in the biosolids. Post-composting storage would decrease these levels further.

The concentrations of nitrate-N in compost over the course of the experiment can be seen in Figure 9. Nitrate-N concentrations increased in all treatments over the course of the vermicomposting process, though the rates differed significantly between those with plasterboard and the control. The composting process would convert ammonium-N to nitrate-N, the soluble and plant usable form of N.

Phosphorous (P) levels over the duration of the experiment are shown in Figure 10. After four weeks P levels had increased in all treatments. P levels in the Control continued to increase until a sharp decline in week 12. Worms are efficient at mineralising organic-P from a wide range of organic materials (Ghosh et al., 1999) as observed by the increase in P. The final P content was similar to animal manure composts.

3.2.3 *Escherichia coli*

Figure 11 shows the number of *E. coli* in the vermicompost over the duration of the trial. The PWWTP biosolids are heat treated and contain very low levels of *E. coli*. At the start of the experiment numbers of *E. coli* ranged from 295 – 2400 MPN/g; at the end of the vermicomposting period *E. coli* levels in all treatments were below 100 MPN/g and therefore met Grade A of the current NZ Biosolids guidelines (NZWWA, 2003).

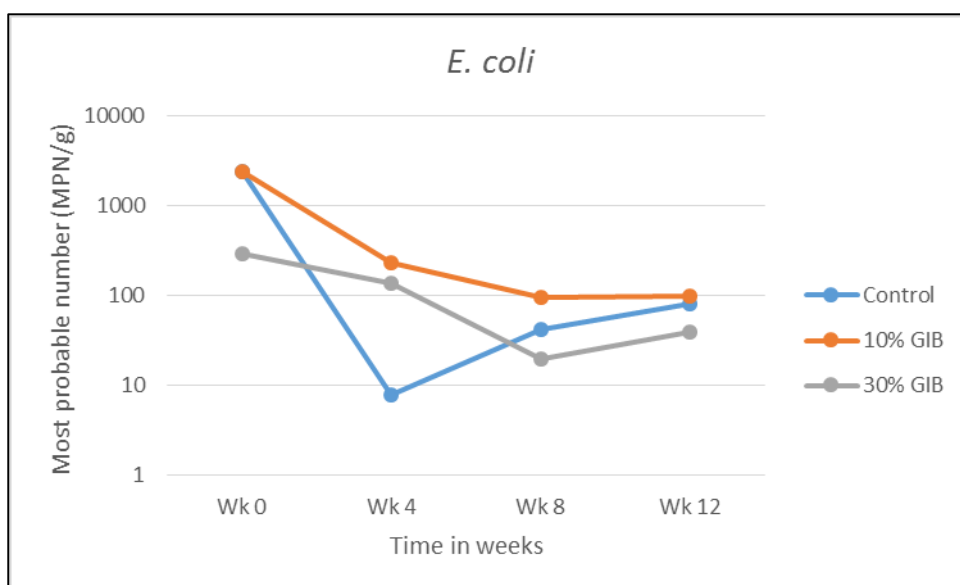


Figure 11. MPN *E. coli* in the vermicompost over the duration of the trial

3.2.4 Zinc and Copper

Figure 12 shows the final concentration of the heavy metals copper and zinc in the vermicompost. Copper and zinc are the metals found at the highest concentrations in sludges and biosolids and are therefore most likely to limit their re-use. For this trial only the concentration of Cu and Zn in the final vermicompost was measured. Only the treatment with 30% plasterboard was below the Grade a limit of 300 parts per million (ppm) for Zn and 100 ppm for Cu in current NZ Biosolids guidelines (NZWWA, 2003). This was likely due to a dilution effect and less biosolids being present in the original mixtures.

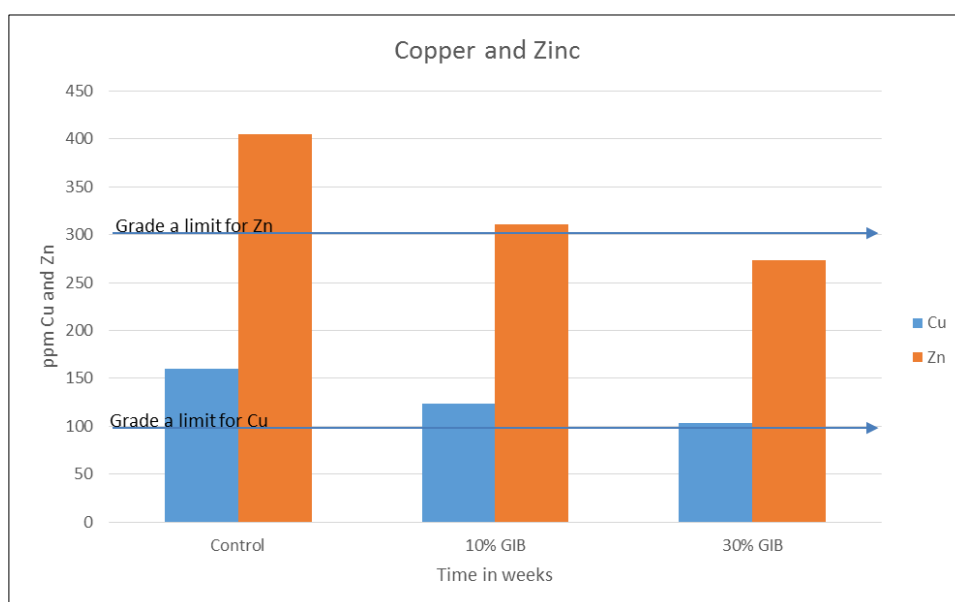


Figure 12. Zinc and copper concentrations in the vermicompost

3.2.5 pH

Figure 13 shows the pH in the 3 treatments over the duration of the trial. The pH in the vermicomposts containing plasterboard is lower through-out the trial period. This is likely due to the enhanced nitrification, a process that lowers the pH.

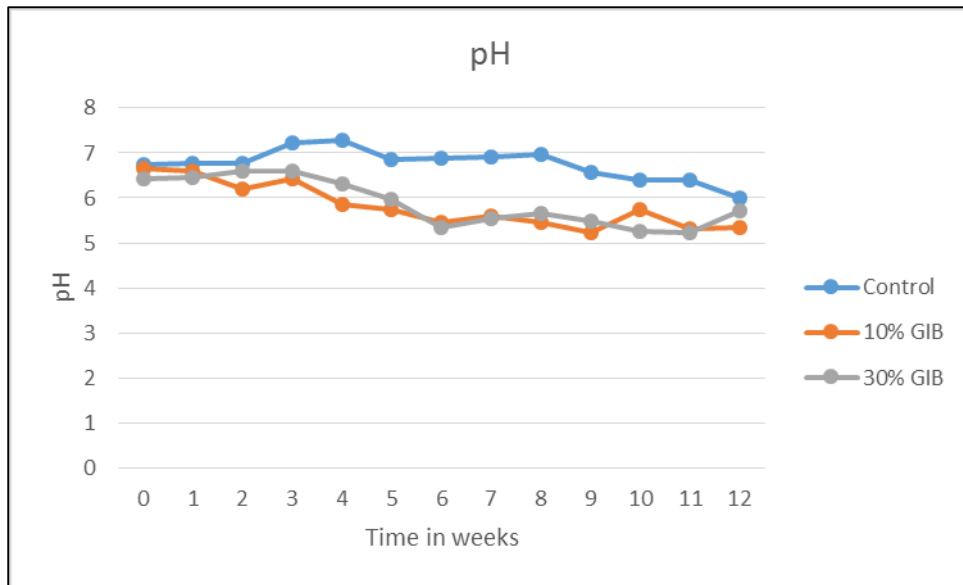


Figure 13. pH in the vermicompost over the duration of the trial

4. CONCLUSIONS

Vermicomposting has the potential to transform the PWWTP biosolids into a high value compost as it is effective at stabilizing nutrients and preventing the re-growth of pathogens.

By itself, the PWWTP biosolids were not suitable for vermicomposting and care needs to be taken to ensure the product is mixed with the correct ratio of bulking agents such as cardboard and green waste. This to ensure it is not toxic for the worms. High ammonium content of the starting mixtures due to high ammonium levels in the biosolids was overcome by a pre-composting period. Difficulties were also encountered with re-wetting the biosolids pellets. A starting moisture content of 75% was not sufficient and the pellets had to be submerged in water to once again create an environment acceptable for the worms. Once the optimal mixture was found the vermicomposting process worked well.

The final vermicomposts had plenty of soluble N to satisfy plant needs and a P content similar to that of animal manure composts. All the composts met Grade A of the current NZ Biosolids guidelines (NZWWA, 2003) for *E.coli* levels. Only the 40% biosolids mixture met Grade a for zinc and copper.

The addition of plasterboard to the compost mixtures appeared to enhance the vermicompost process. This is an interesting finding and warrants further investigation.

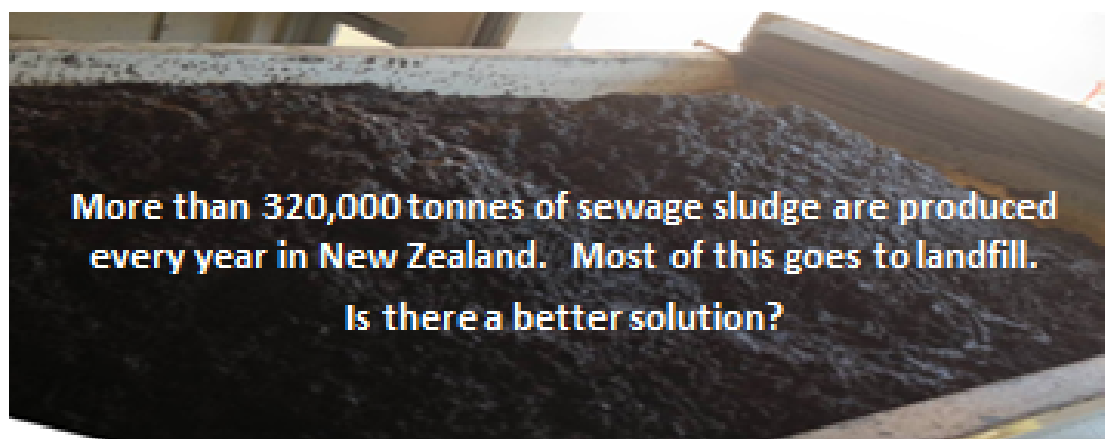
5. ACKNOWLEDGEMENTS

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Special thanks to Staci Boyte and Charlotte Kühn for technical assistance.

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- Managing sewage sludge is challenging and expensive.
- Often the solution chosen is one of convenience rather than what is best for the community and environment.
- Environmental engineers, scientists and local government are working together on a project to look at better ways to manage the sludge produced in the lower North Island.
- Composting is one of many possible options that could transform sludge into a stable organic material that has significant benefits when applied to land.
- As part of this project a trial is being undertaken to investigate the practical and/or technical viability of blending three different sludges with green waste and composting to produce a high-quality product.

The trial: Feilding Wastewater Treatment Plant on a new purpose built concrete pad



For further information contact: Jacqui Horswell, Project Coordinator
Phone: 027 550 5149; Email: jacqui.horswell@escrri.nz

L E W E
Environmental
I m p a c t

 Centre for Integrated Biowaste Research

E/S/R

Interim Report: Organic Wealth “Save on Waste” programme

Organic Wealth was granted \$10,000 in the 2016/17 round of New Technology and Seed Funding (Category 4) grants. While the project is not completed yet, they have submitted an interim report, which is attached here.



Restoring Nature's Beauty

Save on Waste Kapiti Campaign Progress Report

Date: 29th September 2017
Project Name: Save on Waste Kapiti Campaign
Project Sponsor: Kapiti Coast District Council
Project Report Written by: Careoline-Charlotte Myers
Project Start Date: 4th April 2017

Background

On the 16 March 2017, the Grants Allocation Committee approved the allocation of \$10,000 Waste Levy funding to Organic Wealth to roll out the "Save on Waste" business recycling programme on the Kāpiti Coast.

The programme offers free waste audits, education workshops, bin implementation, and monitoring and support services to businesses. to help them minimise their waste.

Progress So Far

Waste Audits

All the businesses contacted were happy to hear from us and keen for us to help them achieve their sustainability goals. Organic Wealth has conducted seven waste audits and one visual audit as follows:

- Coastlands (x3)
- Paula's Beds R Us
- El Rancho
- Goodmans
- Lifestyle Hair
- The Shed Project

Of the above, one business paid \$950 for one of their waste audits and one business contributed \$350 towards the cost of their waste audit.

The businesses received comprehensive waste audits reports that outlined the financial and environmental benefits of reducing their waste, and offered solutions and recommendations to help make it happen.



Restoring Nature's Beauty

Additional Services

Organic Wealth included in their comprehensive waste audit reports a proposal for additional, ongoing services, subsidised by the Kapiti Coast District Council Waste Levy Grant Funding.

So far, three of the businesses audited have taken up the offer of additional services. One business is pending a decision, and two businesses are implementing changes based on the report recommendations.

A business that was referred to Organic Wealth by one of the businesses who had a positive experience with the Save on Waste programme signed up to our additional service programme without requiring an audit.

Subsidised Services

\$2,772 of the KCDC Waste Levy Grant funding was allocated to offering businesses free additional services. During the proposals period I decided that instead of offering them 'free' services I would ask them to 'part contribute' for the services, based on what I felt would work for them. I was pleased to see that some of the businesses were willing to contribute financially. This is a definite shift in attitude from business owners and managers who five years ago would not have been interested in investing any money for waste minimisation consultancy and education services.

Our goal is to gently coax businesses towards fully contributing for waste minimisation services and I am confident this will occur within the next two to five years as businesses become even more conscious of their responsibility in taking care of our planet's precious resources.



Potential Environmental Savings

Of the waste audits conducted to date we can reveal the full potential of the waste diversion from landfill is over 117 tonnes per annum.



Potential Financial Savings

The waste audit data also showed the significant nett financial savings that the businesses could make by implementing or improving their recycling practises – a total of over \$45,000 per annum.





Restoring Nature's Beauty

In Summary

It's been a great start to the Save on Waste Kapiti Campaign. We are happy with the progress being made and the positive impact our programme is making to encourage and support Kapiti businesses to reduce, reuse and recycle.

We look forward to continuing this important work to divert as much waste as possible from the landfill.

Kindest regards,



Careoline-Charlotte Myers
Director

Thank you

