
PLASTIC MINIMISATION CONSTRUCTION PROJECT

A RESEARCH GRANT FROM AUCKLAND COUNCIL'S WASTE MINIMISATION INNOVATION FUND (WMIF)

LINDA KESTLE, TERRI-ANN BERRY, GERMAN HERNANDEZ, ANNETTE DAY, SIMON BURDEN



THE PROJECT

- The Team
 - Linda Kestle (Principal Investigator)
 - Terri-Ann Berry (Director ESRC)
 - German Hernandez (Research Assistant)
 - Ashveen Nand (Plastics Analyst)
 - Annette Day & Callum Morrison (Naylor Love)
 - Simon Burden (Mitre 10)
 - Steve Grace (Green Gorilla)



MITRE 10



AC'S WMIF GRANT & THE PROCESS

- The process of winning a grant?
 - How many are successful?
- PMCP Project
 - Aims
 - Duration – February 2020 – June 2021
- The Sustainable Business Network (SBN) and Auckland Council provided opportunities to meet Annette Day (Naylor Love) and Simon Burden (Mitre 10) to collaborate on this project.
- Value added to Unitec relationships and partnerships with these industry groups and organisations has been immense.





NAYLOR LOVE

PILOT PROGRAMME – PLASTIC COLLECTION

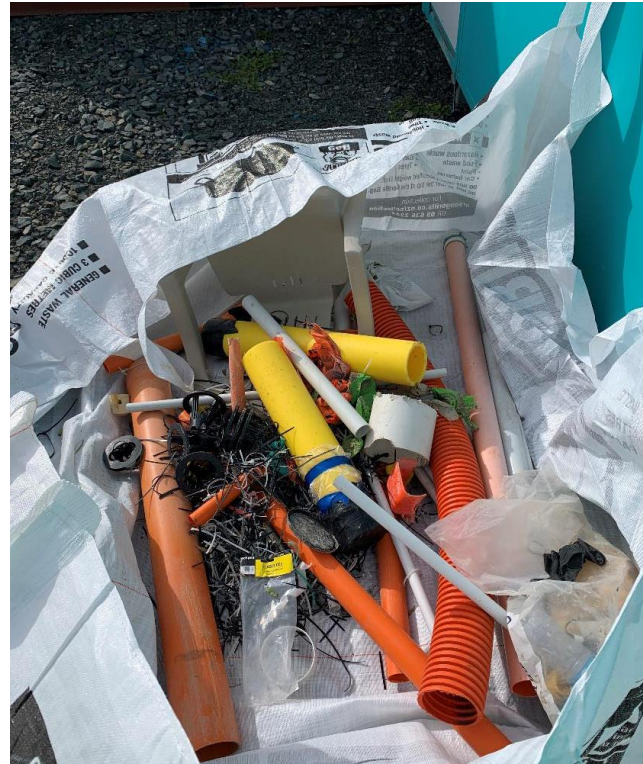
- Sustainable Strategy 2020 – Concentration on waste management
 - Improve – waste partners and on-site management of materials
 - Reduce construction waste to landfills.
- Construction plastic – one of worst single stream waste materials
 - Unable to fully recycle,
 - Reuse = remade into further plastic products,
 - Will not breakdown.
- Naylor Love Staff:
 - Do not feel good about waste,
 - Want to do something but think it will cost more to create “waste avoidance” mentality.
- Proved collection of plastic construction waste as a single stream is possible.
- Remove plastic packaging on bought materials by buying better.



COLLECTED CONTENTS



On-site collection



On-site collection contents



Team at Audit I

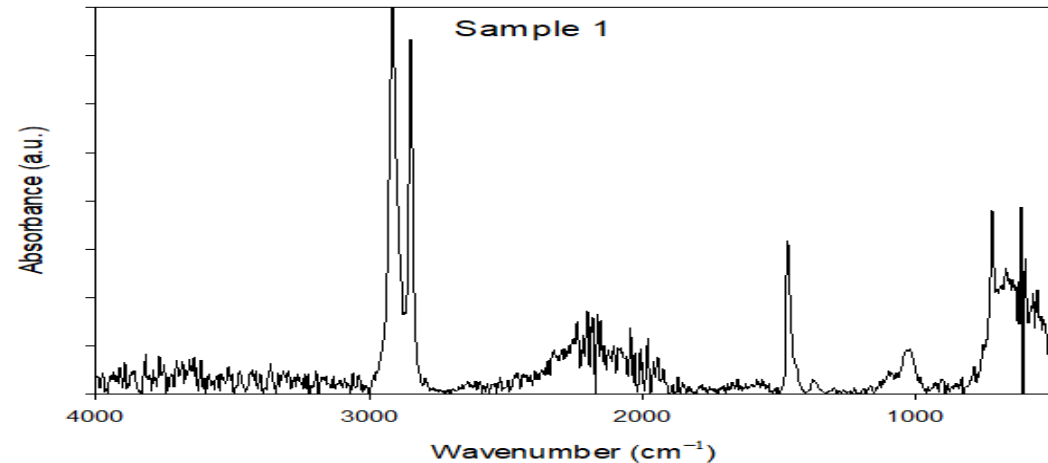


Audit I



AUDIT I – THE RESULTS & SCIENCE OF IT

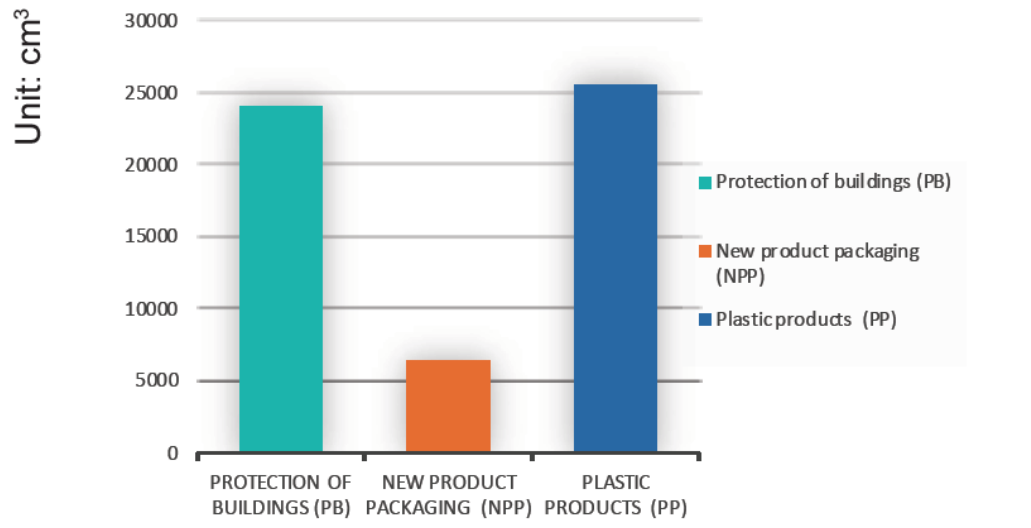
AUDIT I – SPECTROPHOTOMETER CHARACTERISATION



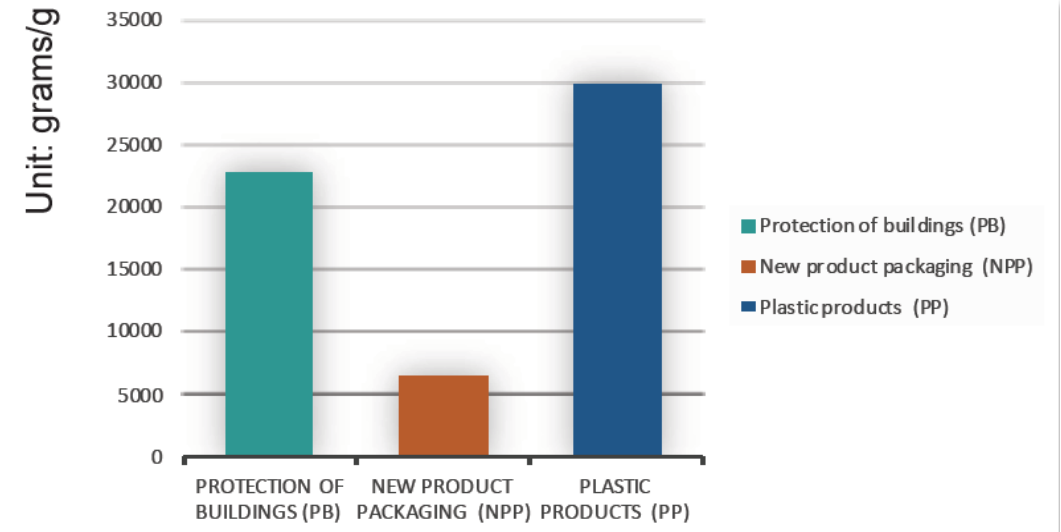
- Samples were characterized using a Bruker Vertex 70 FTIR spectrophotometer.
- The spectra of the samples were recorded as an average of 16 scans.
- Polyethylene (with ethylene-vinyl acetate)
- Prominent FTIR features 2920, 2850 – C-H stretch
- 1470, 730 – CH₂ bend, rock
- 1000 – C-O stretch

AUDIT I – PLASTICS WASTE GENERATION

Plastic waste **VOLUME** generated on construction sites by use



Plastic waste **MASS** generated on construction sites by use



Plastic waste quantification

Type of Plastic	Total Volume (m ³)	Total Mass (kg)
PE	4.6 × 10 ⁻²	43.1
PP	7.36 × 10 ⁻⁴	0.67
PVC	1.4 × 10 ⁻²	19.1
PA	5.07 × 10 ⁻⁴	0.67
Total	6.1 × 10⁻²	63.5



MITRE 10

SUPPLY CHAIN INVOLVEMENT & IMPACTS

- Were sending excessive amounts of plastic to customers.
 - Either – do not know how to refuse the plastic,
 - Or – thought it was normal for the NZ building and construction industry.
- Mitre 10 Tradehub: (*online customer portal*)
 - Option built where customers had to choose to have materials wrapped and packaged in plastics.
- 12-months & 13,091 online trade orders later:
 - 97% - supplied unwrapped,
 - 3% supplied wrapped.
- Change can be made when there are people passionate enough to care and ask simple questions.

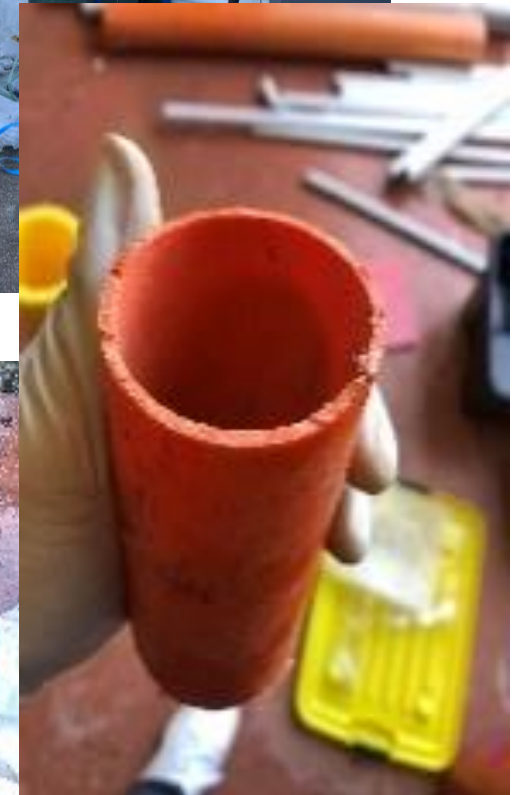




ACHIEVEMENTS, IMPACTS & NEXT STEPS

PROJECT ACHIEVEMENTS

- Placement of plastic specific bins on 3 of Naylor Love's construction sites twice this year.
- Monthly progress meetings with the team at Naylor Love's offices
 - Due to COVID restrictions – zoom meetings and physical on-site pauses of plastic collection.
- Audit 1 analysis (Audit 2 underway soon) of plastic types and volumes.
- Literature review and draft report underway, as research and results progress.



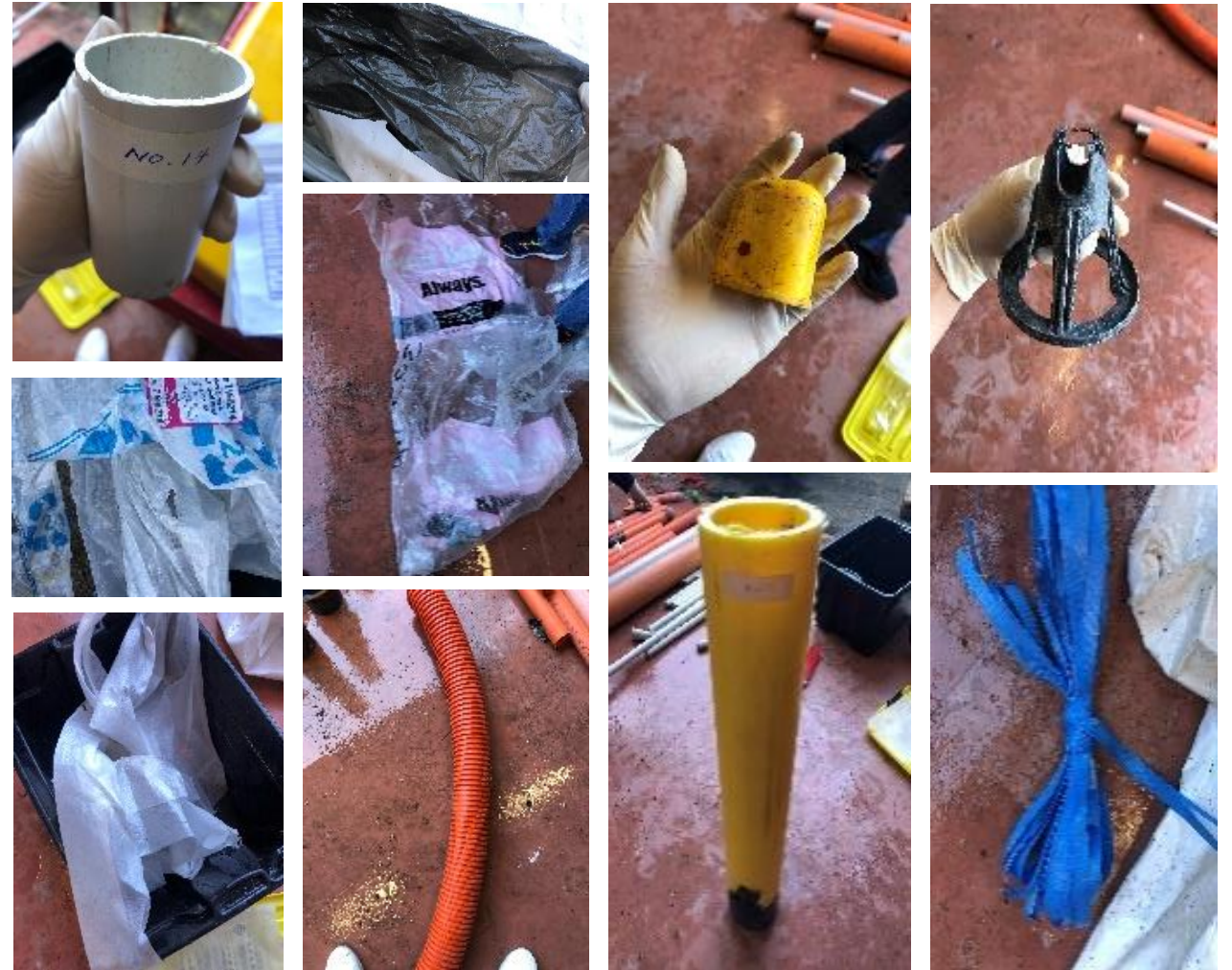
INDUSTRY IMPACTS

- Naylor Love successes:
 - Design and trial of permanent plastic collection bins (with Unitec collaboration),
 - Training and information posters for Naylor Love's staff on- and off-site.
- Mitre 10 successes:
 - Supply chain changes around plastic packaging.
- Strong connections and relationships built
 - Annette Day & Naylor Love,
 - Simon Burden – Mitre 10, and
 - Steve Grace – Green Gorilla.
- *Special thanks to Annette Day – For her personal and professional drive to minimise plastics going to landfill from Naylor Love's construction sites, to make this a rich and impactful research project!*



NEXT STEPS – END OF JUNE 2021 & POTENTIALLY BEYOND?

- Audit 2 – Contents of plastic bins from site – *Just recently completed*
- Full analysis of Audit 1 – *Partially completed and interpreted*
- Literature review – To be finalised and included within final documentation to AC's WMIF Grant – *Due June 2021*
- Expansion to current collaborative work with industry partners – *Proposal in 2021*



Various items from Audit 1

QUESTIONS?



Team at the November Progress Meeting