**To**: Dr. Erika Paterson

**From**: Ms. Samantha Krieg

**Date**: June 22, 2022

**Subject**: Proposal for Improving Understanding of Waste Sorting at the University of British Columbia Okanagan

1. Introduction

The University of British Columbia Okanagan (UBCO) is experiencing significant contamination in waste sorting streams (Mackintosh, 2018). Waste contamination is the presence of unaccepted materials in a waste stream and presents significant problems in diverting waste from landfills (Recycle BC, 2020). If there is considerable contamination in the waste collected, all of it is sent to a landfill instead of being repurposed or disposed of properly (Thoden van Velzen, 2021). In 2018, contamination levels in waste streams at UBCO reached up to 25 percent (Mackintosh, 2018).

A waste management audit done in 2018 by Green Step Solutions (Mackintosh) identified limited awareness of waste sorting practises as a key concern. The results of a survey conducted by Innovate, Design, Sustain (IDS) in 2022 supported this finding by highlighting the lack of knowledge of proper waste sorting on campus. Thus, improving the understanding of waste sorting best practices at UBCO is crucial to reducing significant contamination.

1. Statement of Problem

There is significant contamination in waste streams at the University of British Columbia Okanagan (Mackintosh, 2018). The presence of contaminants (unaccepted waste materials) in waste streams, like compost or recycling, can prevent the materials from being repurposed or disposed of properly (Thoden van Velzen, 2021). The lack of understanding of waste sorting best practices at UBCO is a primary reason for the contamination and must be rectified immediately.

1. Proposed Solution

Over the past six months, I met with the heads of the UBCO Facilities Management and Sustainability Office departments. In addition, I led a team of volunteers to survey students, faculty, and staff at UBCO to understand their waste management knowledge and habits. Finally, I reviewed relevant literature and case studies at UBC Okanagan and UBC Vancouver (Bruce et al., 2018; Foster, 2016; Zelenika et al., 2018). Based on the findings, I have identified three main areas that require improvement:

* Understanding of waste sorting practices
* Understanding of the consequences of waste stream contamination
* Accessibility and simplicity of waste management

To help reduce the contamination of waste streams at UBCO, I propose a feasibility analysis of various initiatives to increase the understanding of waste sorting among students, staff, and faculty. The analysis will comparing the practicability and efficacy of various awareness initiatives and waste sorting technologies. The following main areas of inquiry were identified:

* What factors are contributing to the lack of understanding of waste sorting at UBCO?
* What departments or organizations at UBCO can help reduce the waste sorting knowledge gap? Are there specific areas to which they can contribute?
* Analysis of feasibility and efficacy of the following efforts, implemented on campus independently or in conjunction:
	+ Educational seminars and events
	+ Improved signage near waste bins
	+ Waste bins with automated sorting
	+ Educational signage around campus
	+ Incentives for participation, achievement, or contribution
1. Scope

The purpose of this analysis is to assess the feasibility of improving the understanding of waste sorting practices among students, faculty, and staff at the University of British Columbia Okanagan. The results are intended for immediate review and use by the student club Innovate, Design, Sustains Campus Waste Initiatives team. The analysis will consider the impacts in the next five years and prioritize immediate change.

The scope of this analysis is limited due to time and resources constraints. Thus, it will not include the following considerations:

* Complete cost-benefit analysis considering funding, budget, and targets at UBCO
* Life cycle analysis of proposed signage or technologies
* Comprehensive analysis of the long-term impacts or benefits of the efforts to improve the understanding of waste sorting at UBCO
1. Methods
	1. Surveys

In March 2022, the Campus Waste Initiatives team with IDS surveyed UBCO students, faculty, and staff. The goal of the survey was to gather information about waste management and sorting knowledge, habits, and interest among the population. Overall, the results showed that participants were willing to put in the effort necessary to sort and manage waste properly but often lacked the knowledge or resources required. A comprehensive analysis of the results of this survey will be part of the feasibility analysis. The information gathered will help determine the potential efficacy of the efforts to increase the understanding of waste sorting listed in section four.

A second survey will be done in July 2022 to gauge the interest of UBCO students, faculty, and staff in the proposed efforts to improve their understanding of waste sorting. This survey will continue the work done by IDS in March and will focus on the potential benefits or impacts of specific efforts. The questions asked will be more pointed than those in the IDS survey and will not gather information on general behaviours or knowledge. The second survey will inform the feasibility analysis and compare the efforts proposed in section four.

* 1. Informational Interview

An informational interview will be conducted with Jamie Armer, the Manager of Custodial and Waste Services at UBCO. This interview will help to develop a better understanding of the significance of the waste contamination and the feasibility of the efforts proposed in section 4. Questions will gather information on the current levels of contamination at UBCO and the ways in which the Facilities Management department can support the proposed solution.

* 1. Literature Review

A literature review will be done to provide supporting evidence for the information gathered in the surveys and informational interview. The primary focus of the review will be on case studies conducted on waste management and sorting practices at UBC Okanagan and Vancouver (Bruce et al., 2018; Foster, 2016; Zelenika et al., 2018). Journal articles and reports with information about waste management education and waste sorting habits will be explored throughout the feasibility analysis. These case studies, articles, and reports will inform the recommended efforts to increase understanding of waste sorting at UBCO.

* 1. Regulation, Standard, and Policy Review

Relevant regulations, standards, and policies will be reviewed to inform the feasibility analysis. Information will be gathered from these sources to understand the acceptable levels of contamination in the Okanagan region. This will provide a threshold for comparing the efficacy of the proposed efforts to improve the understanding of waste sorting at UBCO, listed in section four. The sources of documents to be reviewed include, but are not limited to, the following:

* Recycle BC
* City of Kelowna
* Regional District of Central Okanagan (Bartlett, 2017)
1. My Qualifications
	1. Campus Waste Initiatives Co-Lead at Innovate, Design, Sustain UBCO

As the IDS Campus Waste Initiatives Co-lead, I am an expert in UBCO’s waste management practices and shortcomings. In this role, I have led a small, motivated team to increase the amount of waste diverted from landfills on campus. My responsibilities include:

* Create and promote a campus-wide survey to better understand the waste management knowledge and habits of UBCO students, faculty, and staff
* Communicate with project stakeholders for feedback and approval, including the UBCO Facilities Management department and Sustainability Office
* Coordinate with other executive members of IDS to create events on campus that improved awareness of sustainability efforts and waste management
	1. Civil Engineering Student

My academic experience as a civil engineering student has highlighted the importance of triple bottom line sustainability. Coursework has focused on maintaining a holistic perspective while designing technologies, initiatives, and systems. This knowledge will be an asset to me while analyzing the feasibility of the awareness initiatives and waste sorting technologies. It will help me to consider the various factors that influence the efficacy of the proposed efforts and any potential impacts.

1. Conclusion

Contamination of waste streams at the University of British Columbia Okanagan (UBCO) increases the build-up of otherwise redirected materials in landfills. It is crucial to address the lack of understanding of waste sorting among students, faculty, and staff. A feasibility analysis of the proposed efforts to minimize the knowledge gap is necessary to understand the most effective solutions. This analysis will involve surveys, an informational interview, and a literature and regulation review. The results of this analysis can be used immediately by Innovate, Design, Sustain to inform future actions and projects. The main areas of inquiry reviewed in the proposed feasibility analysis will provide a starting point for efforts to improve the understanding of waste sorting at UBCO.

**Works Cited**

Bartlett, V. (2017). *Solid waste management plan: Regional District of Central Okanagan*. Unpublished Article. Morrison Hershfield Ltd., Burnaby.

Bruce, K., Corley-Smith, K., Lee, David., Sanchez, M. (2018). *Campus waste: Garbage, recycling, and composting efforts*. Unpublished Article. University of British Columbia Okanagan, Kelowna.

Foster, K. (2016). *The Effectiveness of 3D Display Cases In The AMS Nest*. Unpublished Article. University of British Columbia, Vancouver.

Mackintosh, A. 2018. *UBC Okanagan waste audit*. Unpublished Article. Green Step Solutions Inc., Kelowna.

Recycle BC. (2020, May 19). *What happens to my recycling: A closer look.* Retrieved June 22, 2022, from https://recyclebc.ca/what-happens-to-my-recycling-blog/

Thoden van Velzen, E. U., Molenveld, K., Brouwer, M. T., Van der Zee, M., & Smeding, I. (2021). *Issue paper: Recycling of different waste streams*. (Report / Wageningen Food & Biobased Research; No. 2209). Wageningen Food & Biobased Research. https://doi.org/10.18174/555442

Zelenika, I., Moreau, T., & Zhao, J. (2018). Toward zero waste events: Reducing contamination in waste streams with volunteer assistance. *Waste Management*, *76*, 39–45. https://doi.org/10.1016/j.wasman.2018.03.030