UBC Food Services Pre-Consumer Waste Management Project

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Executive Summary

With growing concerns around the world over how to best manage the increasing amount of waste generated by modern society, it is apparent that food systems place a significant strain on waste management systems. Waste also places a burden on food systems since valuable organic material is not being recycled back into the production system. The UBC Food Systems Project (UBCFSP) spearheads several sustainability projects within the Faculty of Land and Food Systems, which include this study on UBC Food Services' Pre-Consumer Waste Management. Our report highlights our research methodologies and findings that helped generate recommendations for three UBC Food Services food outlets and to the department of UBC Food Services as well.

Our study was focused on Ike's Café, Totem Park Residence Dining Hall and The Point Grill Restaurant. We began by conducting a literature review before collecting primary data. We conducted several semi-structured interviews with staff members at these food outlets and recorded observational data during two site visits to the kitchen facilities. From this data, we identified the barriers that may prevent each location from being successful in their waste management.

We found that each facility had substantially different results; therefore, our final recommendations were tailored to each site. Our findings revealed that Totem Park contained waste that was improperly sorted, known as contamination, in several bins and that there was a misuse of bin labels. Ike's Café revealed low levels of waste contamination in the kitchen but high levels of contamination in the front-of-house area. The Point Grill had low levels of contamination. However, staff members at each location had conflicting opinions on how to dispose of milk cartons and health and

hygiene products such as gloves.

Our recommendations for Totem Park included subscribing to the Ethical Bean bag return program, phasing in different compost and recycling bins, eliminating garbage bags from compost bins, and placing small compost bins under hand-wash stations. We believed that The Point Grill could benefit from installing a planter box to grow several of their own greens and to explore the idea of a self-contained greenhouse. For Ike's Café, we believed that sandwich scrapings can be properly disposed of into a small compost bin at the front-of-house and that the large garbage bin can be replaced by two smaller bins for soft plastics and garbage instead.

Our project was limited in that we were not able to observe the study kitchens during peak hours. We were also met with the challenge of creating a balance between economic feasibility and sustainability goals. Our suggestions for future projects include conducting a third site visit to note the difference in staff behaviour during busy hours. We also believe that our interview questions and observation criteria were greatly improved with the assistance of our UBCFSP coordinator and primary stakeholder.

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1 - Introduction

Food systems place a significant strain on resources both globally and locally, but have the potential to make drastic changes to alleviate major sustainability concerns. At The University of British Columbia (UBC), sustainable food systems have become a core focus for addressing the array of sustainability issues, including climate change and waste management (UBC Sustainability, n.d.). Each level of the food supply chain reveals barriers but also room for improvement in processes and behaviours associated with moving towards a more sustainable system. Our report on UBC Food Services' pre-consumer waste management is part of the family of UBC Food Systems Projects. Our project focused on uncovering these barriers within three food outlets, and in particular, their challenges of back-of-house pre-consumer waste management. The project aimed to find meaningful solutions to the challenges faced by UBC Food Services staff and provide suggestions to enhance the kitchen infrastructure layouts and back-of-house facilities to improve proper waste-sorting functionality. We studied three different food outlets to uncover challenges and opportunities specific to each type of food outlet.

This report will outline the methodology of the project, the data collected, and our final outcomes and interpretation of the data. In this report, contamination is defined as any material that is improperly sorted into either garbage, compost, or recycle bins.

Globally, cities in Europe, Australia, and North America are making changes to their infrastructure in order to proactively respond to climate change and reduce their environmental impact to a level that the earth can sustain (City of Vancouver, n.d.). Joining a number of cities across Canada, the City of Vancouver has come up with its

own climate change adaptation strategy based on the ICLEI Local Governments for Sustainability guide, “Changing Climates, Changing Communities” (ICLEI Canada, n.d.). One part of this strategy is being carried out by means of the Greenest City 2020 Action Plan. This Action plan aims to ensure that, “[...] Vancouver remains a livable and resilient city in the face of climate change” (City of Vancouver, 2014). This plan targets regional waste issues using Metro Vancouver’s Zero Waste Challenge as inspiration. The purpose of this challenge is to reduce solid waste entering landfills or incinerator by 50 percent from 2008 levels. This target will be achieved, in part, by composting all food scraps and yard waste, and collecting recycling. UBC aims to comply with this mandate, and hopes to be a leader in waste management so as to exemplify to other institutions measurable and reproducible ways in which zero waste systems can be achieved (UBC Sustainability, 2014). This particular project investigates waste management in the UBC Food Service Operation Unit (UBC Sustainability, n.d.).

Sustainability aims to achieve a long-term balance between the environment, society, and our economy. In this paper, we define a sustainable waste management system as a system that incorporates each of these elements to transition from the conventional system of handling waste to one where our environment has the capacity to assimilate what we’ve produced, society can thrive, and the economy is not inhibited from growth.

It is commonly understood that the social and economic activities of developed nations has lead to anthropogenic climate change (Davidson, 2010). It is up for debate as to whether urbanism can be accomplished in a sustainable manner. Urban areas in particular, with their growing populations and related activities, present persistent social

obstacles in areas such as cultural relations and employment. Moreover, social sustainability objectives, in terms of justice and equality, are difficult to separate from goals of environmental sustainability. Most ideas on social sustainability are linked to ways in which we can preserve our natural resources for future generations (Davidson, 2010). UBC also realizes that the three pillars cannot be viewed separately if a holistic view of sustainability is to be achieved. For example, one goal for achieving economic sustainability involves encouraging suppliers to come up with creative ways to ship material using reused or recycled packaging (UBC Sustainability, 2014). Additionally, goals for social sustainability are progressing in the Centre for Interactive Research on Sustainability (CIRS Building) where researchers are exploring ways in which inhabitants of a green building might differ in terms of health and happiness measures (UBC Sustainability, 2014).

Waste reduction and recycling materials into our production system can provide many environmental benefits including the reduction of greenhouse gases (GHGs) from landfills and the recovery of useful resources that would otherwise be lost in landfills. However, sustainable waste management offers numerous benefits beyond environmental considerations. Transitioning to a more effective waste management system can reduce operating costs for businesses and provide opportunities for training and professional development for staff members (Nemetz, 2013).

Legislation can be used to move waste up a ‘waste hierarchy’, which aims to encourage producers to reuse, recover, and recycle their wastes rather than direct is towards a landfill (Hand, 2006). Metro Vancouver will set out a mandate to divert 70 per cent of solid waste from landfills by 2015 (Metro Vancouver, n.d.). This plan intends to

create more environmentally friendly cities by reducing climate altering greenhouse gas emissions that are created when materials are dumped in landfills or incinerated, and by reducing damage to our environment when new resources are extracted (City of Vancouver, 2014).

The vision statement for the UBCFSP provided our team with guiding points to reflect on whether our project objectives and research findings would help support this vision. Pre-consumer waste is a small but significant part of our overall food system and the statement helped us connect our project with the bigger picture. We began to understand the changes that both our group and other UBCFSP groups would likely bring forward to build upon the vision this year. One point that was directly related to our project was the idea of zero waste produced by the system. However, the vision that most resonating with us was the idea that “On-campus food providers [can] work with off campus distributors and wider food system actors to transition to a more sustainable system” (UBC Food Systems Project, 2012). We felt that this emphasized that waste reduction was the responsibility of all actors in our food system.

As students in The Faculty of Land and Food Systems (LFS), we understand the importance of recycling and composting as a means to reduce unrecoverable waste and to close the loop, thus enabling the move towards a more sustainable food system. Our education provided through LFS has challenged us to view issues with a ‘systems perspective’ and to look at the environmental, economic and social implications of sustainability. When presented with this food systems project, we realized that economic sustainability would be an overriding concern in food establishments across the campus, as they are businesses that are required to generate a positive flow of

income. We saw this project as both a challenge and an opportunity to demonstrate that approaching businesses with the idea that having concern for environmental sustainability can ultimately lead in the direction of enhancing economic sustainability through the creation of a closed loop system which requires fewer inputs and creates fewer negative externalities.

2 - Methods

Our methods consisted of two main approaches: (1) a literature review on current waste management strategies, and (2) multiple site visits to three kitchen facilities to make observations and gather data.

In order to successfully review and form recommendations that aim to optimize back-of-house pre-consumer waste management at Ike's Café, The Point Grill Restaurant, and Totem Park Residence Dining Hall, our research methodology was mainly formulated around a small set of questions. These questions allowed us to assess the current pre-consumer waste management situation at each location and recommend ideas that fit the criteria set by UBC's Waste Action Plan. These questions allowed us to identify which waste items were improperly sorted into compost, garbage, and recycling bins and the reasons and contributing factors behind it. This, in turn, allowed us to create solutions that are realistic in its application while allowing these UBC Food Services outlets to properly aim for zero waste production. Thus, the project methodology primarily focused on performing site visits to collect qualitative data and conduct interviews to assess and uncover certain barriers that currently inhibit UBC Food Services at these particular locations from achieving their zero waste goals.

Prior to our site visits, a literature review was undertaken to gain background knowledge on current methods of sustainable pre-consumer food waste management systems in similar establishments and university food outlets. We placed a greater emphasis on strategies that have succeeded in Metro Vancouver. Existing UBC Food Systems Project (UBCFSP) reports and suggestions from stakeholder consultations were also used as background resources to form a detailed methodology. Furthermore, we consulted with Bud Fraser to learn more about the project objectives and extend our background knowledge in the context of UBC. This phase of the project allowed us to form concise questions and determine the type of observations that were vital in preparation for the initial site visits. These questions and observations were approved by Brent Mansfield prior to site visits.

Throughout the 2013-2014 Term 2 winter session, our team conducted back-of-house site visits on two occasions for each location. Initially, our aim was to conduct these two visits during peak and non-peak hours to make comparative observations of the work environment. This methodology was modified due to scheduling conflicts. Instead, second site visits to each location were used to discuss possible ideas for improving waste management and make observations of changes that may have occurred after our initial site visit. The initial site visits to all three locations took place from February 26 to March 7 while second site visits occurred from March 24 to March 28. All site visits took place during business hours between 10:00am to 4:00pm to allow for proper observations of the work environments.

All group members participated in the site visits to the Totem Park Residence Dining Hall, the largest of the three locations, while visits to Ike’s Café and The Point

Grill Restaurant were divided amongst the group. Questions and observations made at all three locations were identical for all initial site visits to ensure precision in data collection. Semi-structured interview questions were asked to a number of UBC Food Services employees and chefs. Because each location varied in the size of operation and menu offerings, there were varying numbers of staff between the three locations and no set number of interviews arranged. Questions focused on what items staff found the most cumbersome to work with and changes they would like to see in their work environment. Observations made from the initial site visits focused on the number and location of different of waste collection bins available, the accessibility to these bins, clarity of container labels, and the accuracy of waste sorting and the identification of contents that contribute to contamination. Appendix A lists the questions asked and observations made during our initial site visits.

Following initial site visits, ideas on how pre-consumer waste management could be improved were formulated based on the observations and interview responses made at each location. We consulted additional sources of literature to pinpoint specific recommendations that could serve as the initial steps for enhancing pre-consumer waste management. Ideas generated to improve back-of-house waste management were personalized for each of the three locations. In contrast to the first site visits, the goals of second site visits were to note any differences in our data collection from respective initial site visits and discuss our ideas with staff employees and location contacts to gain feedback on the reality of implementing ideas.

With feedback from second site visits, we finalized our recommendations on how pre-consumer waste management can be improved for each location.

3 - Findings and Outcomes

3.1 - Literature Review

The literature review provided us with crucial information regarding the long-term sustainability goals and specific targets that UBC has committed to achieving, but also how this project and UBC Food Services play a key role in improving waste management on campus. We consulted several documents produced at UBC, including the UBC Climate Action Plan and the UBC Waste Action Plan. To complement our research, we also focused on local sources such as the City of Vancouver and Metro Vancouver for information and case studies on organic waste and the region's waste management plans.

The UBC Climate Action Plan provides a comprehensive outline of strategies to target a number of areas contributing to greenhouse gas (GHG) emissions on campus. The UBC food system is one of the key components of the action plan since each actor in the food supply chain can impact the amount of emissions and waste produced. The Food section in the climate action plan emphasizes the importance of increasing knowledge and awareness as well as providing incentives to switch to less carbon-intensive food (The University of British Columbia, 2010).

UBC is also working to finalize a Waste Action Plan for the campus which aims to realize the vision of a zero-waste campus (The University of British Columbia, 2011). Coupled with Metro Vancouver's plan to ban organics in landfills by 2015, the UBC Waste Action Plan highlights the need to divert more waste from landfills, particularly with organic waste. The Waste Action Plan discussion paper estimated that only about 25% of organics are currently being composted at UBC (The University of British

Columbia, 2011).

With the upcoming Metro Vancouver ban on organics in landfills in 2015, the region has developed several guides for residents and businesses to assist with the transition. Metro Vancouver has also published case studies of local restaurants that have redesigned their waste systems to accommodate organic compost collection (Metro Vancouver, 2014).

Our literature review also yielded examples of innovative ideas implemented in local and North America that integrate food production and waste reduction and waste management. It is important to look at the ongoing business models since UBC Food Services has a variety of outlets that provide distinctive food services to satisfy students' and staffs' needs on campus. For example, a local sustainable tech firm and an eatery have teamed up to install the city's first self-contained composter and vertical growing system (The Vancouver Sun, 2013). Urban Stream Innovation and Luke's Corner Bar & Kitchen have been promoting their closed-loop micro-farm as a strategy to reduce transportation costs, waste disposal costs, pollution, greenhouse gas emissions, and improve access to fresh produce (Urban Stream, 2014). Another example is a waste tracking system created by Leanpath, which monitors the pre-consumer food waste trail from tables to the garbage bin (Leanpath, n.d.). These examples provided us with inspiration that assisted with finding solutions for our project. In addition, these ideas create a broader picture of the opportunities to research for our waste management project.

3.2 - Site Visit Data

In this section, we summarized our data from initial site visits including

observations and semi-structured interview responses from UBC Food Services employees at Totem Park Residence Dining Hall, Ike's Café, and the Point Grill Restaurant. The complete data collected at all three locations can be found in Appendix B, C, and D. Levels of contamination at each location was ranked as low, medium, high, or none. Low contamination indicates that most food waste products were observed to be properly sorted into respective disposal bins during times of site visits. High contamination indicates that most food waste products were observed to be improperly sorted into either garbage, compost, or recycle bins during times of site visits.

3.2.1 - Totem Park Residence Dining Hall

Of the three locations, Totem Park Residence Dining Hall has the largest back-of-house work area that is divided into two raw food prep areas, a baking area, a cooking area, a dish washing area, a loading area, storage areas, the front of house area, and an office space. This UBC Food Services location has the greatest number of employees and the largest output of the three locations, with some of the foods made being shipped to other food service outlets on UBC campus.

Though the number of garbage, recycling, and compost bins varied between the two site visits, the number of garbage bins observed back of house consistently outnumbered the number of compost and recycling bins, and a proportion of bins were shifted around to different areas of the kitchen. The location of these bins are noted in the bin tally of Appendix B. Our findings revealed that the Totem Park Residence Dining Hall kitchen had a high degree of contamination in the compost bins, as well as the a great volume of recycling and food waste in garbage bins *(*Appendix B*)*. Most open-top bins used in the kitchen were lined with black garbage bags and were used as garbage

disposals while they were mainly filled with recyclable or compostable materials such as paper towels, food scraps, and soft plastics. Furthermore, most of the taller bins used were improperly labelled while smaller buckets were unlabelled.

Although there were informative posters handed out to students to resolve post-consumer waste management issue, there were no waste-sorting posters in the back-of-house area of Totem Park Residence Dining Hall. Certain packaging such as the coffee packages of a reflective plastic material from Ethical Bean Coffee confuse employees and are typically thrown away into garbage bins and the majority of milk cartons were being recycled or composted. A more thorough explanation of the data collected from Totem Park Residence Dining Hall can be found in Appendix B.
From interviews, employees were aware of UBC's goal for zero waste and wished to practice it. They were aware that certain bins in the kitchen workspace were designated for specific kinds of waste despite the lack of proper labelling; however, they admitted that they neglected to properly sort waste products when there was a large workload. Based on their responses, we predicted that soft plastics and cardboards contaminated by food products were thrown into the garbage, and milk cartons were disposed in recycling bins.

At this particular location, efficiency and output were vital as it has effects on other UBC Food Services outlets as well. We had also learnt that annual training was provided to the employees to review the techniques and to notify changes happening in UBC Food Service kitchens. In the past, they have attempted to implement waste sorting systems that included smaller compost and recycling bins but it was not entirely successful due to the frequency they needed to be emptied. Larger compost bins often

became too heavy and conflicted with workers' union rules when needed to be emptied. Thus bins designated as composts were lined with garbage bags that were used to empty into compost and reused in bins.

3.2.2 - Ike's Café

The back-of-house workspace at Ike's Café was the smallest of the three UBC Food Services locations assessed in this project. The kitchen lacked a proper stove area and employed one chef since Ike's Café was not originally intended to serve hot meals. Space in the kitchen and front-of-house is very tight and thus garbage, recycling and compost bins are placed in strategic locations that maximize efficiency of staff. There was only a small number of staff members.

Ike's Café had zero contamination in the compost bins and recycling, and low amounts of contamination in the garbage bins at the back-of-house kitchen area. The front-of-house bins had zero contamination in the compost bins (coffee grounds); however, the garbage bin contained a mix of garbage, recycling, and food waste. Recyclable hard plastics and metals were primarily accumulated underneath one of the shelving as there was no proper recycling bin front-of-house due to lack of space. These observations are consistent between both site visits.

From our interviews, we learned that the pre-consumer waste produced is added to respective post-consumer waste disposal twice a day as there is no separate disposal location for this UBC Food Services location.

3.2.3 - The Point Grill Restaurant

The Point Grill is a campus restaurant located in the Marine Drive residence area on UBC campus. It offers "seasonally-inspired cuisine with a commitment to local and

sustainable foods” to follow the sustainability initiative of UBC Food Services. The restaurant includes a small kitchen with limited workspace yet enough for the proper functioning and completion of daily tasks. The waste management system in this restaurant is primarily monitored and regulated by the head chef. Initial training for composting and recycling was provided to all staff as well as practiced and incorporated on a daily basis.

Our site visit revealed that The Point Grill kitchen primarily used two rectangular-sized open-top recycling bins, one for paper and another for container recycling. These two recycling bins had wheeled attachments at the bottom, and thus, provided convenience in transporting bins for emptying. We recorded one large UBC organics green bin with a lid placed in the kitchen used to gather all organic waste throughout the day. However, organic waste were first gathered in the 4-5 white buckets around the kitchen and a food waste slot in the dishwashing table to ensure efficiency and convenience in food production during busy hours. A brief kitchen layout is drawn to show the location of the bins and the kitchen areas (Appendix D). The white buckets were free to move around the cooking area, so the bucket location shown in Appendix D gives the general location we observed of each bucket.

The Point Grill contained very low levels of contamination in the compost and recycling bins. We observed that other than the two recycling bins containing clear garbage bags, no garbage bag of any kind was used in the kitchen. In addition, there were no garbage bins present in the kitchen since all waste was either recycled or composted. Milk cartons were recycled in the container recycling bin. Latex gloves used by some staff members were also disposed in the plastic recycling bin along with other

plastic items such as used straws.

4 - Discussion

It became apparent in our project the complex nature of pre-consumer waste management since it extended much further than food storage and preparation. As Tim Lang (2009) suggested, ecological public health must be incorporated into the business model. Managing pre-consumer waste becomes one of the many strategies that link economic and environmental health since we can observable positive changes from reducing costs to alleviating the strain on regional landfills.

Our findings revealed that each establishment we visited had its own particular set of barriers that prevent, and strengths that assist, in proper waste management. These characteristics depended on such factors as size of the kitchen and front of house area, number of staff, as well as the particular function the food establishment served. However, there were also common issues (and strengths) that had been found in all three UBC Food Service outlets. In this section, barriers and strengths will be discussed separately.

4.1 - Totem Park Residence Dining Hall

The Totem Park dining hall was the largest of the three establishments and functions as a cafeteria. It is very busy and full of staff prior to meal times. It also functions as a preparation area for catering. From the data, Totem had the highest degree of contamination in the composting, recycling and garbage bins among all three locations. Some contents disposed did not match the bins that they are intended for. This issue was frequently observed in almost all bins in the kitchen, which was primarily

due to the factor of work efficiency in the kitchen.

Therefore we determined that barriers to effective pre-consumer waste management at Totem Park Residence Dining Hall are attributed to pressures for efficiency and large output of foods, large work area (in regards to walking distance to bins), and greater numbers of employees. Totem Dining hall exhibits strengths that may contribute to efforts in proper waste management. Firstly, all staff is provided with initial training at the start of each school year in how and where to properly dispose of certain items. Secondly, there is infrastructure in place that is able to capture waste at the source. For example, many compost bins are present in the area where the highest degree of vegetable and fruit preparation takes place.

We found that there was a discordance between the data observed and the replies received during interviews with staff members. Staff members are well trained and are knowledged about the proper waste sorting method that should take place in kitchen. However, compostable waste and recyclable waste are not a priority, at least not at a cost of efficiency at Totem. Because Totem is also serving as a preparation station for a few other UBC Food Service location, efficiency must be the priority for completing the tasks in order to meet the needs of the students and other food service locations.

On the other hand, two waste sorting methods used to in the Totem kitchen were effective and can possibly be adopted in other Food Service locations. The first strength was the use of buckets for the collection of banana peels and juice boxes in the front-of-house area. Secondly, soft clear plastic bags were collected in separate bag instead of a hard plastic bin or container. This method saved space in the kitchen and were also

straightforward for the staff member to understand the use of that bag.

4.2 - Ike's Café

Ike Café is a small establishment that serves mainly pre cooked meals and baked goods. The kitchen employs only one chef, while the front end employs several staff. The main barrier present at Ike's Café is the small space in the front of house. This presents the challenge that there is no area to place a recycling bin, so any items that are not obviously recyclable (such as milk jugs) end up in the one garbage can. One other disadvantage we noticed was the pre-consumer waste at Ike's Café was mixed into the post consumer waste Sort-it-Out Stations. This means that contamination of pre consumer waste occurs when customers improperly sort their waste. Ike's Café also experiences highly fluctuating and inconsistent peaks in business. this can result in employees diverting attention away from proper sorting in order to serve customers. Ike's Café shows strength in that the bins that are present especially for certain items are used effectively. A couple of examples include: all coffee grinds are dumped into one small organics bin beside the coffee station, and all receipts are put in a paper recycling bin under the cash register. The kitchen area reveals the main strengths of the establishment, as we found very detailed sorting of compost, soft plastic, and other recycling. This care for sorting detail also shows that there is awareness of sustainability and the environmental benefits to composting and recycling.

4.3 - The Point Grill

The Point Grill has one head chef and a small number of staff. It is a medium sized sit-in casual fare restaurant. The kitchen size is relatively small, but large enough for the proper functioning of the restaurant.The size of the kitchen serves as the main

barrier that leads to improper waste sorting since it does not allow a wide array of large bins to sort each type of material. The kitchen area presents a small space for employees to move around. This problem was solved by an alternative use of the smaller organic waste buckets. The use of these white buckets help the employees during the peak operating hours, so they do not have to worry about constantly going to the green organic bin. It not only maintained the efficiency of work completion, but it also prevented the improper sorting of food waste. At the same time, the small space has also put a limitation to further development in the kitchen area. In busy times all compost, recycling, and garbage materials were placed in the same container, and proper waste separation relied upon there being gaps of time when sorting could take place.

The overlying strength of the point Grill that allows for waste sorting to take place is the strong leadership that is seen in regards to creating a sustainable workplace. The strong leadership drives the staff enthusiastically toward achieving sustainability goals of this business. Secondly, the current waste sorting systems are very effective and the bins are accessible considering the location of each station as well as the size of the kitchen. The waste sorting system has possibly maximized the potential of the kitchen in waste management and contributes to its remarkable minimal waste contamination. Unlike Totem Park, which is a cafeteria, the Point Grill is a restaurant where the business is straightforward and acts independently from UBC Food Service. This allows open suggestion for creative ideas and enhancement in organic waste reduction and proposals for a greener kitchen.

4.4 – Overview

As UBC students entering these establishments and making observations and asking questions as to what infrastructure and attitudes assisted in proper waste management, we were attempting to create a dialogue between ourselves and staff in which barriers could be revealed and solutions could be created. A more in depth look into the both the barriers that impede, and the strengths that assist in proper waste sorting, could result in more long lasting solutions to assist UBC Sustainability towards its goal of zero waste. Public dialogue is receiving support in policy decision making because it takes into account both public and expert knowledge to create sound and acceptable decisions (Petts, 2004). Engaging with the staff members at these various establishments revealed that time and space efficiency is one of the main barriers that prevents proper waste management from taking place. Our recommendations will not be considered practical solutions if either time or space efficiency is compromised.

Our findings revealed that some organics are still entering the waste stream, and not being diverted to the compost. It is important to understand why this might still be occurring despite the existence of training and infrastructure that discourage this behaviour. A UK study on food waste in households reveals that there is a disconnect between the action of throwing food into the garbage, and the environmental impacts that this can have (Graham-Rowe et. al, 2014). Our findings may suggest that some employees of these food establishments could benefit from additional training that help them to understand the implications of their actions rather than assuming they carry this knowledge.

A common concern among all three locations was the recyclability of milk cartons, particularly for products of low use (for example: cartons of cream and half-

and-half cream). Staff members had conflicting beliefs on whether milk cartons were recyclable in paper recycling bins. Another issue that may need to be addressed was the constant dispose of latex gloves used in all three locations. Since The Point Grill does not have garbage bins in the kitchen, used latex gloves were generally placed in recycling bins, which may cause low levels of contamination. Although latex gloves are typically made from natural material, they are considered waste products onced used, and should be sorted separately from recyclable and compostable materials.

5 - Group Reflection

The most challenging aspect of the project was formulating solutions to improve pre-consumer waste management that do not hinder the efficiency staff workers. While the initial site visits helped us construct an overview of the kitchen space and formulate ideas for better pre-consumer waste management, the second round of site visits allowed us to gage the reality of them. Our recommendations were also highly dependent on the cost of implementing our ideas.

Ultimately, our group realized that if UBC Food Services and the UBC Sustainability Office wish to achieve the goal for zero waste on campus, there must be an emphasis that environmental care is equally as important as business profitability. Based on our observations from these three distinct UBC Food Services locations, the greater issue lies in economics and time efficiency. Budget and time constraints are a major limiting factor to many improvements towards sustainability. We have observed that successful waste management strategies in particular locations are accompanied by a shift in attitude towards placing priority on the environmental impact of a business as well as efficiency. Thus, we believe that UBC Food Services and the UBC

Sustainability Office should focus on helping employees shift their mindset and habits and work with campus food outlets to develop strategies that improves waste management without hindering task efficiency. overall, waste management is a new concept that people have to become used to so that it eventually becomes habit, it cannot happen overnight and zero waste most likely will not happen by 2015.

6 - Recommendations

In terms of a timeline, we anticipate that recommendations related to organic waste be addressed by the end of 2014. Since Metro Vancouver will be implementing the ban on organics in landfills in 2015, we must take action to put these changes in place before the ban is fully in place. Our recommendations below outline site-specific solutions given our research findings.

6.1 - UBC Food Services and UBC Sustainability Office

Based on the data collected from Totem Residence Dining Hall, Ike's Café, and The Point Grill Restaurant, we believe that UBC Food Services and the UBC Sustainability Office can collaborate in standardizing all back-of-house garbage, recycling, and compost bins so that they do not take up too much space and that bins will not get too heavy and are of proper height so that employees do not have to constantly bend over as to abide by union rules. Recycling and compost bins should be easily identifiable to reduce confusion and should be just as or more easily accessible than garbage bins in its construction. From our observations, we have noted that the most contamination occurs in bins that are lined with garbage bags, thus, it may be necessary to consider designing bins that cannot fit garbage bags. However, this would

mean that bins would need to be constantly sanitized to maintain a clean workspace and meet Food Safe regulations. Further research will be needed in designing proper bins and establishing a proper procedure in handling and cleaning them. We have noted that compost and recycling bins at the Point Grill Restaurant are placed on wheel trolleys and are easily accessible. We believe that inspiration can be drawn from this or the employment of clear plastic garbage bags to create more awareness about contamination.

We believe that there should also be a standardization in a training regime across all campus food outlets in regards to proper waste management to encourage a change in mindset towards waste management to influence change in workplace habits and minimize any confusion. Cascades Recovery, a business that handles UBC's non-organic waste offers services for tenant, staff, and housekeeping awareness and education (Cascades Recovery Inc, 2014), and we feel that it would be helpful to explore this training opportunity in order to create a cohesive waste management system across the UBC campus.

We also recommend that UBC Food Services and the UBC Sustainability Office work closely with campus locations that have significantly larger back-of-house workspaces to iron out site-specific waste management strategies that allow UBC Food Services employees to maintain workload efficiency. Based on our observations, there may be too much pressure in trying to maximize workplace efficiency, productivity, and environmental sustainability during times of high volumes of work and we believe that this collaboration effort will help alleviate some of this pressure and will provide the most support in helping manage pre-consumer waste.

Ultimately, any efforts by UBC Food Services and/or the UBC Sustainability Office in improving pre-consumer waste management should be implemented little by little rather than a large overhaul. No matter the size or location, each food services location observed prioritizes efficiency and profit and thus, waste management strategies should be implemented over time and assessed to determine the positive and negative effects.

6.2 - Totem Park Residential Dining Hall

After consulting with Piyush Sahay, the executive chef at Totem Residence Dining Hall, we narrowed our ideas to a few recommendations that we believe will result in immediately improving current pre-consumer waste management:

A. Reduce the number of garbage bins and increase the number of clearly labelled compost and recycling bins in easily accessible locations
B. Reduce the usage of black garbage bags in green compost bins to avoid confusion and waste contamination in bins
C. Employ smaller compost bins in convenient locations in raw food prep areas of the kitchen
D. Place small compost bins adjacent or underneath handwash stations to minimize disposal of paper towels in garbage disposal
E. Consider subscribing to Ethical Bean Coffee bag recycling program to reduce disposal of coffee bean bags in garbage
F. Only place milk cartons into garbage bins

Based on all the data collected at Totem Residence Dining Hall, we realize that there have been many initiatives taken to promote proper waste sorting , but due to

large number UBC Food Services employees working back-of-house and a high daily volume of work, there are several barriers present that prevent successful waste management. The recommendations listed above are steps we believe can help in further promoting waste management back-of-house.

In order to meet UBC's aim for zero waste, further waste management strategies will need to be implemented but this may result in too much pressure for the kitchen, itself. Thus, we believe a collaboration between UBC Food Services and the UBC Sustainability Office is needed to devise, implement, and successfully maintain a waste management strategy that does not hinder workspace efficiency and productivity. From what we have observed, this may be the most effective method is not only meeting UBC's aim for zero waste but also help alleviate pressure on the facility and its employees.

6.3 - Ike's Café

After consulting with Nick Matees, the chef at Ike's Café, we narrowed our ideas to two recommendations that we believe will make the most impact in improving and maintaining pre-consumer waste management practices:

A. Replace large front-of-house garbage bin with a smaller garbage and a soft plastic collection bin
B. Use the coffee grinds composting bin to dispose of all front-of-house sandwich food scraps

We have noticed from our observations that most contamination occurs in the front-of house garbage bin because it is in a central and easily accessible location. We

have noticed many dry soft plastics within, which could otherwise be recycled. The front-of-house workspace is limited so in order to maximize space and improve waste sorting, we recommend substituting the existing large garbage bin for two smaller bins for soft plastics disposal and garbage.

One of our concerns at Ike's Café was that the pre-consumer waste was being combined with the post-consumer waste because there would be more opportunity for contamination resulting in landfill disposal. However, after consulting with Bud Fraser, this would be deemed as a concern to address if Ike's Café was contributing at least 50% of the large UBC standardized compost bin daily.

6.4 The Point Grill Restaurant

After consulting with Josh McWilliams, the head chef at The Point Grill, we narrowed our ideas to two recommendations that we believe will make the most impact:

A. Expand the patio planters to grow enough herbs, microgreens, and/or edible flowers to produce a sustainable supply for ingredients in their menu
B. Explore idea of implementing a shipping container greenhouse for growing own vegetables and herbs

We selected the option of expanding the patio planters for several reasons. First, there are six existing pots containing herbs and edible flowers on the patio at The Point Grill; however, the current level of production is not sufficient to sustain the supply required to include such ingredients on a menu item. We believe that a long but narrow planter along the edge of the patio would be the most ideal location. It receives a sufficient amount of sunlight and provides a large enough area to produce a significant amount of greens. Secondly, we found that many fresh herbs and microgreens had a

short shelf-life and required individual packaging of fairly small quantities. Since it is not particularly feasible to purchase these ingredients in bulk, it would be ideal to grow these items on-site. Thirdly, there are added benefits to introducing more green space to the patio dining area as customers will be able to make a greater connection to their food and how it was produced.

We also believed that The Point Grill could implement a longer-term strategy by installing a container greenhouse directly adjacent to the restaurant. The container greenhouse can provide produce year-long while assimilating organic waste back into a self-sufficient, closed-loop system. While this technology exists locally and there are businesses that can design the system, we feel that this idea can potentially become more valuable as a future SEEDS project or similar campus-based project that facilitates learning and innovation for students, staff and faculty members.

7 - Scenario Evaluation and Feedback

We found several of our processes were successful and we anticipate that future UBCFSP can benefit from our methods and findings. First, we believed that our site visits were successful in revealing the back-of-house waste management processes in food services outlets. Our semi-structured interview questions were strengthened with the assistance of UBCFSP coordinator, Brent Mansfield. We suggest to future project members that reviewing questions with the coordinator and stakeholders will help better define our purpose and enhance research findings. We found it challenging to create recommendations for each individual food outlet given the difficulties of balancing economic feasibility, time and labour constraints of staff members, and sustainability goals set by UBC. We believe that our additional research on case studies and other

success stories helped us expand our ideas and suggestions to our stakeholders. In the future, we hope that a third site visit would be beneficial to observe the changes in staff behaviour during peak-hour busy times. This addition would add great value to our findings and uncover additional barriers and opportunities for improvement.

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Appendices

Appendix A: Criteria for Recording Site Visit Data

Semi-Structured Interview Questions

1. What items do you end up throwing in the garbage most often and why?
2. What food products or packaging do you find the most cumbersome to work with or discard properly?
3. What change would you like to see (for handling waste) in the kitchen that will help you enhance efficiency/ease at work?

Site Visit Observations

Bins:
- Placement of compost/garbage/recycling bins (convenience)
- Size of compost/garbage/recycling bins (large round, narrow rectangular, buckets)
- Clarity of bins (visibility/signage/simplicity of instructions)
- Frequency of bin emptying (once a day or several times per day)
- Number of bins and their locations, if they seem functional, convenient and easily accessible to staff

Waste:
- Rank stages that generate the most waste (waste from storage, ingredient preparation, cooking)
- Timing/time of day as a factor of how accurately waste was sorted (mark if time was a factor in properly separating waste)
- What did staff members throw into garbage bins? (example: paper towels may have been thrown into the garbage bins when they can be composted, scan what's inside bin)

Appendix B: Data from Totem Park Residence Dining Hall

	Garbage	Paper	Can/Plastic	Organics/Compost
Total	9+	1	2	2
Locations and Notes	1 in dishwashing station	1 outside offices	1 next to storage, adjacent to raw materials prep (but labelled as paper recycling)	1 in dishwashing station
	2 in bakery prep	(2 additional in loading dock for cardboard and		1 in raw food prep
	1 in			

	breadmaking area 2 in cooking area 2 in wrap station 1 in serving area	pallet wrap)		
Contamin-ation Rank (High-Medium-Low-None)	High	None	Low	Low
Contamination Notes	Most items can be disposed of in other bins, every bin observed was mainly filled with soft plastics, paper towels, gloves, organics	Office paper properly sorted		Low in dishwashing station but some plastics found in raw food preparation area

Appendix C: Data from Ike's Café

Date of Visit: March 7, 2014 *Time: 10:00am-11:15am*
Group members who conducted site visit: Carla Turner and Crystal Chan

Number of People Interviewed with signed consent forms: 1

Answers from Interviews:
- He is aware of UBC Zero waste mandate
- He firmly believes that properly sorting waste is an adjustment of mindset but once established, it is easy to follow
- He disposes soft plastic packaging that have been in contact with meat into garbage disposal
- He is the only one working back-of-house
- There is no styrofoam packaging in his kitchen

Observations:

	Garbage	Paper	Can/Plastic	Organics/ Compost
Total	2	1	1	2
Locations and Notes	1 in front-of-house	1 under cash counter	1 plastic bag in kitchen	1 in kitchen
	1 in kitchen		(plastic milk jugs stored under shelf)	1 in front of house, near coffee machine
Contamination Rank (High-Medium-Low-None)	Low/High	Low	Low	Low
Contamination Notes	Low in kitchen			
	High in front-of-house			

Other Observations:
compost , recycling from back of house gets combined with post consumer waste

Appendix D: Data from The Point Grill Restaurant

Date of Visit: Wednesday, March 5, 2014 *Time:* 3:00pm-4:00pm
Group members who conducted site visit: Tania Leon and Sherry Xu
Number of People Interviewed with signed consent forms: 1

Answers from Interview:
- Some plastics, straws, gloves land into compost bin when they should be in recycling.
- We avoid products that require a lot of labour or waste.
- Sometimes staff are rushing, dumping waste all at once (fast, casual dining setting)
- Josh is the main person that trains new staff - expectations are built into job description, Josh also handles the inventory and unloading.
- we use a "whole foods approach" (raw, source, local) → whole carrots → use main part for dishes → use tops/ends in stock, etc.
- operate based on 3-semester season, and change menus 3x per year
- dishwasher or general UBC waste collector generally carries/removes waste from kitchen
- promote local, in season, and minimal waste
- core rush hour lunch: 1-2pm, dinner 5:30-8:30pm
- prep and processing generates more waste than storage waste

Observations:

	Garbage	Paper	Can/Plastic	Organics/Compost
Total	0	2	2	6
Locations and Notes		1 in central walkway, near dishwashing area	1 in central walkway, near dishwashing area	1 large near dishwashing area
		1 at back, near freezer	1 at back of kitchen	1 small bucket at front
				1 slot inset in dishwashing counter
				1 small bucket at meat prep area
				2 buckets in cooking area
Contamination Rank (High-Medium-Low-None)		Low/None	Low/None	Low
Contamination Notes		Minimal contamination	Minimal contamination	2 straws and gloves

Other Observations:
- cloth napkins laundered by contractor, but can't seem to find a better alternatives at the moment

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Date of Visit: March 27, 2014 *Time:* 3:30pm - 4:30pm
Group members who conducted site visit: Tania Leon and Sherry Xu

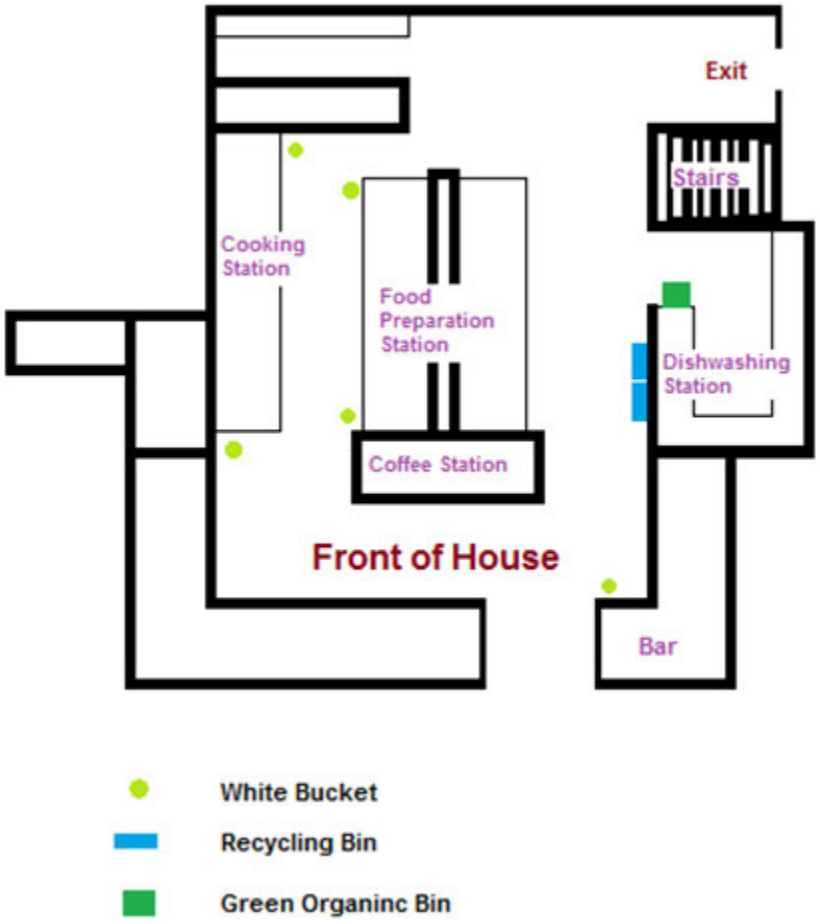
Questions Asked: Input and approval on recommendations, questions on their feasibility

Answers from Interviews:
Opinions on Recommendations:
- extremely supportive of growing their own herbs and microgreens/edible flowers (they currently have 6 small planter pots but those can't sustain enough production to make it a regular ingredient in dishes/menu items (see uncommon ground, victory gardens, luke's on granville)
(reduce waste for highly perishable fresh herbs and microgreens, enhances greenery to patio)
- maybe switching to plastic milk jugs, given that cartons aren't recyclable
- some shipments in cardboard boxes (meat, some Freshpoint and some DFS) while others in crates/reusable containers (milk, bread)
- coffee packaged as whole beans, bulk and in paper bag with foil-lining (staff says they put them into paper recycling)

Observations:

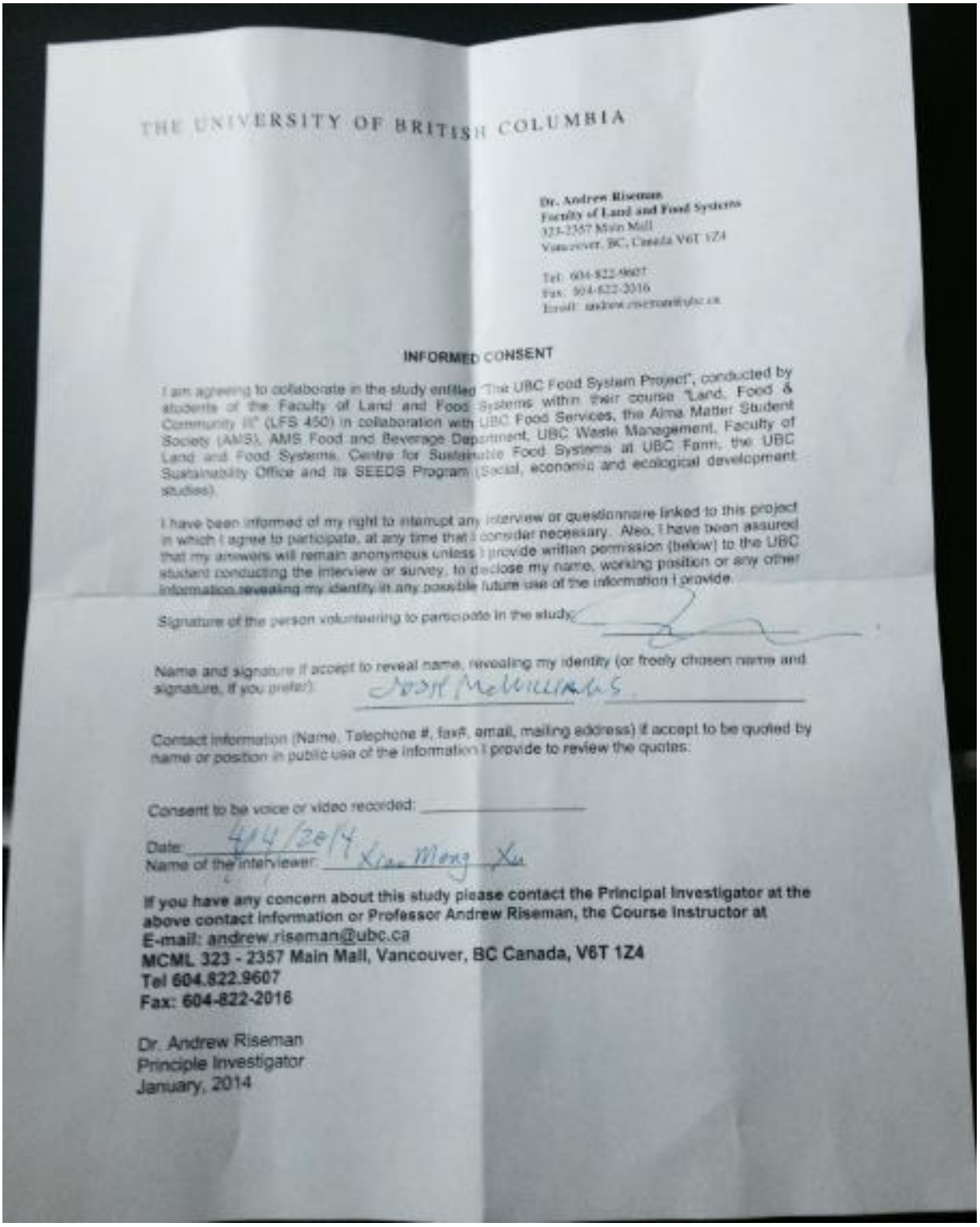
- Layout, bin placements, and contamination relatively the same as initial site visit

Sketch of The Point Grill Kitchen Layout - Bin Locations



Appendix E: Participant Consent Forms

(attached to following pages)



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INFORMED CONSENT

I am agreeing to collaborate in the study entitled "The UBC Food System Project", conducted by students of the Faculty of Land and Food Systems within their course "Land, Food & Community III" (LFS 450) in collaboration with UBC Food Services, the Alma Matter Student Society (AMS), AMS Food and Beverage Department, UBC Waste Management, Faculty of Land and Food Systems, Centre for Sustainable Food Systems at UBC Farm, the UBC Sustainability Office and its SEEDS Program (Social, economic and ecological development studies).

I have been informed of my right to interrupt any interview or questionnaire linked to this project in which I agree to participate, at any time that I consider necessary. Also, I have been assured that my answers will remain anonymous unless I provide written permission (below) to the UBC student conducting the interview or survey, to disclose my name, working position or any other information revealing my identity in any possible future use of the information I provide.

Signature of the person volunteering to participate in the study: _____

Name and signature if accept to reveal name, revealing my identity (or freely chosen name and signature, if you prefer): Josh McWilliams _____

Contact information (Name, Telephone #, fax#, email, mailing address) if accept to be quoted by name or position in public use of the information I provide to review the quotes:

Consent to be voice or video recorded: _____

Date: 4/4/2014
Name of the interviewer: Xiao Meng Xu

If you have any concern about this study please contact the Principal Investigator at the above contact information or Professor Andrew Riseman, the Course Instructor at
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Signature of the person volunteering to participate in the study: _____

Name and signature if accept to reveal name, revealing my identity (or freely chosen name and signature, if you prefer): PIYUSH SAHAY _____

Contact information (Name, Telephone #, fax#, email, mailing address) if accept to be quoted by name or position in public use of the information I provide to review the quotes:

Consent to be voice or video recorded: _____

Date: March 26, 2014
Name of the interviewer: Crystal

If you have any concern about this study please contact the Principal Investigator at the above contact information or Professor Andrew Riseman, the Course Instructor at
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Signature of the person volunteering to participate in the study: Edgardo Montifalka

Name and signature if accept to reveal name, revealing my identity (or freely chosen name and signature, if you prefer): Edgardo Montifalka

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Consent to be voice or video recorded: _____

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Name of the interviewer: Crystal Chan & Tania Leon

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Signature of the person volunteering to participate in the study: MBney

Name and signature if accept to reveal name, revealing my identity (or freely chosen name and signature, if you prefer): Maya Bney.

Contact information (Name, Telephone #, fax#, email, mailing address) if accept to be quoted by name or position in public use of the information I provide to review the quotes:

Consent to be voice or video recorded: _____

Date: 02/28/14
Name of the interviewer: Crystal Chan & Taniakeon

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