

## FINAL REPORT: SP0102 « Reducing Chemical Lab Waste »

relevant tasks in his laboratory.

As the project progressed, several transformations occurred and our team shed light on information regarding other universities' best practices. Through my personal experience, I was able to enter this project when it was at a relatively mature state and learned several things in a dynamic setting. This report will outline the accomplishments, some challenges and lessons learned as well as recommendations for similar projects in the future.

### 2. Accomplishments / Impact on McGill

Initially, this project was supposed to rely quite extensively on lab work to determine greener lab practices for undergraduate and graduate students. As well, previous work identified organic solvents to be responsible for the largest volume of liquid hazardous waste coming from the Otto Maass building. These initiatives led to the realization of the huge potential of solvent recycling, which led to our initial budget amendment requesting sufficient funding for a solvent distiller. Several phases complemented this process including negotiations with hazardous waste management, environmental health and safety as well as the chemistry lab director in order to approve of such a machine in our university. On the provider's side, an additional amount of time was necessary to wait for the preparation, shipping and installation of the equipment.

The original goal of this distiller was to optimize and expand the recycling program to distill a maximum of acetone from graduate labs. An initial experimentation process shed light on a slew of technical issues, making it clear that the distiller would need to be modified to handle a wider range of solvents. The original goal was to distill a maximum of acetone from graduate labs. An initial experimentation process shed light on a slew of technical issues, making it clear that the distiller would need to be modified to handle a wider range of solvents.

approximately 80\$ (or 25L) per run, which can contribute to significant savings for the teaching labs over the course of a semester.

#### Summary of undergraduate runs

Batch Distillation	Input (L)	Output (L)	Yield (%)	Recuperated cost (\$)
October 29 <sup>th</sup>	29	26	90%	81.77
November 3 <sup>rd</sup>	28.5	22	77%	69.19
November 10 <sup>th</sup>	36	26.5	74%	83.34
November 24 <sup>th</sup>	32	27	84%	84.92
December 2 <sup>nd</sup>	25	21	84%	66.05
<b>Average</b>	<b>30</b>	<b>25</b>	<b>82%</b>	<b>77</b>
<b>Standard Deviation</b>	<b>4</b>	<b>3</b>	<b>6%</b>	<b>9</b>

to ensuring visibility of green chemistry concepts to researchers. This group was a large part of my succession, and have handed off relevant reports that will live through their future workshops and informational events.

### 3. Project Management Experience

As a recent graduate of McGill, it was an incredibly exciting opportunity to impact the community in a concrete manner. Although this initiative had been in vigour for an entire year without my involvement, I was quickly given the responsibility of carrying on all tasks I believed would be impactful and making pertinent decisions to ensure the safe integration of the recycling program. During the transition between the outgoing project manager and me, several complications occurred and budget amendments became necessary to rectify future spending. As well, a contract detailing my resources and responsibilities added clarity to my job title, and would be recommended for any incoming participatory member of the SPF. Another suggestion would be more standardized information that could be made into some type of "training session" for project managers, given once per semester, including information on budgeting. More transparency on budgetary procedures will aid in better budgeting (ex. budgeting man hours versus man hours plus vacation, properly converting from American to Canadian dollars, etc.). This could also be an interesting

Finally, I learned how to get people invested. Several students and staff showed a great amount of generosity towards me and the projects, including the team of lab technicians and Professor Lumb's students. I involved these people in brainstorming sessions and showed my appreciation for their ideas and insight. This led to the creation of a volunteer group of young undergraduate students to test out new reactions to be implemented in lower level courses. Similarly, discussions with specific lab groups were better because it was a relatively formal way of explaining the recycling program and, since the professor was present, there was an authoritative influence to agree with me.

#### 4. Recommendations for future projects

There are several sustainable initiatives that merit attention in the future within the chemistry department. For example, heavy metal precipitation as well as substitution of some hazardous chemicals in experiments could greatly reduce the toxicity of most waste outputs. Furthermore, since xylene is young