Creating Sustainable Labs at Western Washington University

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Table of Contents

Executive Summary

WWU is known for being a progressive and environmentally-conscious campus, and the introduction of a sustainable lab certification would help promote eco-friendly practices across the various laboratory facilities on campus. Currently, a sustainable office certification program is already in the process of being rolled out, and numerous universities have successfully adopted both sustainable office and sustainable lab certifications. These certifications significantly contribute to enhancing our university's standing in the "Sustainability Tracking Assessment and Rating System" (STARS), where we currently hold a Silver certification, ranking as the third tier among Platinum, Gold, Silver, Bronze, and Reporting. While WWU takes pride in being a sustainable campus, when compared to other institutions with strong sustainability initiatives, WWU is at a mid-level position. Sustainability is important on a local and global scale as climate change continues to affect us, we need to be leaders of change and set a good example for other universities to follow and for students as they move into their professional careers. The project's focus revolves around the science labs at Western, encompassing aspects such as the proper disposal of hazardous waste and the execution of safety training protocols. This is important to our student body, who are passionate about making Western's campus as sustainable as possible, and to our administration, as the benefits of having certified green labs go further than just helping our planet. These labs efficiently reduce overall expenses by curbing energy and water consumption, minimizing waste, and cutting greenhouse gas emissions.

Our group set out to design a self-assessment checklist certification that labs can utilize to evaluate their sustainability practices and secure a Sustainable Lab Certification. This includes a spreadsheet of the different categories each with multiple questions on sustainable practices in the lab. To ensure that no lab is left without guidance, each category comes equipped with resources outlining the appropriate methods, including references for EHS Hazardous Waste Disposal and information on energy-efficient equipment suppliers. The ultimate objective is for each lab to perform a self-audit, fill out the checklist, and receive certification in the form of a plaque, printed certificate, or door sticker. We aspire to promote annual re-certifications, with departments actively endorsing this certification initiative both within their units and across the entire campus. Our first goal is to create a straightforward checklist and audit three labs: SciTech Wet Chem and Optical Microscopy Lab, and Professor Montaño's Toxicology lab. These labs will set the stage for wider adoption of the certification as other labs learn about it and take part in the process. Collaborating with SciTech, which maintains connections with every department on campus, will offer a neutral platform for promoting the certification to other labs. Future recommendations involve the development of a more detailed checklist and the expansion of the certification program throughout the campus. We also intend to present the certification to the SciTech board and arrange meetings with multiple departments to discuss its implementation. Recognizing that many labs may face financial constraints in implementing significant changes,

we propose another recommendation: the availability of Sustainability, Equity, and Justice Fund Grants (SEJF) to help cover initial expenses.

Introduction

Statement of Need

A pressing need lies in addressing the environmental impact generated by Western's 40 scientific laboratories. Lab work and research have inadvertently resulted in substantial waste, primarily comprising single-use materials like plastic and glass. Laboratories that are essential for innovation and cannot be shut down yet also contribute to climate change by emitting hazardous chemicals and high energy consumption. The extensive use of single-use products and the continuous operation of instruments further compound the issue. A recent study by the University of Cambridge found, "The annual carbon footprint of a typical life science laboratory has been estimated to be around 20 Total Carbon Dioxide (tCO_2e)," equaling 22,403 pounds of coal burned. The challenge is diminishing labs' carbon footprint without compromising their fundamental functions. This issue is pervasive across the scientific field, universities, and various laboratory disciplines, including chemistry, biology, engineering, physics, geology, and environmental science. Failure to address this problem contradicts the very goal of research, which is to solve problems but exacerbates the more significant issues of climate change, waste accumulation, and finite energy resources.

Project Goals

The project's overarching objective was to craft a thorough toolkit designed explicitly for lab spaces at Western Washington University, with a central focus on diminishing their collective carbon footprint. This ambitious undertaking has been completed through a structured approach by creating a checklist of sustainable standards for lab spaces with distinct standards for various lab types, such as chemical, wet and instrumentation labs. Lab Audit Recommendations will guide tailoring audits to different lab types, ensuring a consistent and effective evaluation of sustainability practices.

In contrast, a preferred audit procedure has been established. The audit process conducts a comprehensive assessment of current lab practices, identifying areas for improvement and proposing actionable steps for enhancing overall sustainability. This project has explored emerging trends and innovations, identifying opportunities for continuous improvement and advancement in lab sustainability. In the long term, this project has involved and will continue to

involve developing strategies to translate successful practices into broader educational settings, extending the positive impact of the toolkit beyond laboratory environments. By accomplishing these goals, the toolkit will be a comprehensive resource empowering Western Washington University's lab spaces to reduce their carbon footprint actively, fostering a culture of sustainability and environmental responsibility within academic research.

Background Research

Sustainability within the context of the certificate encompasses a multifaceted approach to responsible and ethical laboratory practices. The primary objective is to minimize the environmental impact of laboratory activities, promoting a balance between social, economic, and ecological considerations. This involves a commitment to decreasing the carbon footprint associated with laboratories, emphasizing the reduction of greenhouse gas emissions. Attention is directed toward quantifying and mitigating the total amount of fossil fuels utilized throughout the life cycle of laboratory products, materials, and equipment, thereby addressing the interconnected challenges of energy consumption and waste generation. Specific focus areas include the reduction of waste produced, achieved through innovative practices in waste minimization, recycling, and responsible disposal. Acknowledging the diversity among lab types is crucial, with distinct considerations for wet labs encompassing chemistry, biology, environmental science, and polymer materials engineering and instrumental labs spanning physics, geology, and engineering. Some of these key differences for wet labs can include sample types, these can be material, chemical or biological. The primary type of samples used can largely affect the type of waste produced. For example, in a biology lab, the waste may include copious amounts of biohazardous waste that has been burned using a high amount of energy. Comparatively, chemistry labs produce chemical waste that has to be stored in fume hoods and neutralized. Understanding these differences allows for tailored strategies that account for each discipline's unique challenges and opportunities. Compliance with Environmental Health and Safety (EHS) requirements for waste disposal ensures that sustainable practices align with safety protocols, promoting a holistic and secure approach. Additionally, developing a waste matrix offers a structured guide for categorizing and managing various types of laboratory waste, facilitating efficient waste segregation and recycling practices. In essence, sustainability within this certificate framework embodies a commitment to responsible resource utilization, waste reduction, and energy efficiency, fostering a culture of environmental stewardship within laboratory settings.

Western Washington University's Sustainable Lab Certification is not an isolated initiative; rather, it was shaped based on various sustainability efforts at other universities. The

University of Washington, another major university in the state of Washington, shares similarities in waste requirements and waste stream resources, creating a shared context for addressing these challenges. We were able to gather ideas for audit questions and ways for labs to improve by looking at what they do. Similarly, Northern Arizona University's lab audit played a pivotal role in shaping Western's initiative, emphasizing a collaborative exchange of best practices, especially regarding energy usage and energy-saving practices. The University of Alabama Birmingham's focus on recycling gloves aligns with the broader sustainability goals, showcasing a network of universities committed to eco-friendly lab operations. Furthermore, Western's Sustainable Lab certificate finds resonance with the University of Colorado Boulder's research on freezer temperatures, illustrating a collective effort to enhance energy efficiency and sustainability in laboratory settings. The experience drawn from these labs was critical in the shaping of Western Washington's Sustainable Lab certificate.

Pursuing sustainable lab certification processes is pivotal in aligning laboratory practices with the United Nations Sustainable Development Goals (SDGs). As laboratories play a significant role in scientific research and innovation, their environmental impact is substantial. Sustainable lab certification involves implementing practices prioritizing responsible resource consumption, waste reduction, and energy efficiency. This commitment resonates strongly with multiple SDGs:

1. Sustainable Development Goal 9, Industry, Innovation, and Infrastructure, is directly addressed as sustainable lab practices contribute to developing environmentally responsible industry standards. By fostering innovation in lab processes, the project seeks to enhance the overall infrastructure of laboratories at Western Washington University.
2. Sustainable Development Goal 12, Responsible Consumption and Production, is intrinsically linked to sustainable lab certification. The project aligns with the global goal of promoting sustainable consumption patterns through conscientious consumption of resources, waste reduction, and adopting eco-friendly practices.
3. Sustainable Development Goal 13, Climate Action, is a central theme in the project's objectives. By decreasing the carbon footprint of laboratories and implementing energy-efficient measures, the project actively supports global initiatives to combat climate change.

Pursuing sustainable lab certification is not merely a local endeavor. Still, it resonates with the broader international commitment to building a sustainable and resilient future, as outlined by the United Nations Sustainable Development Goals.

Methodology

Data Collection Process

The first step of our data collection process included an initial meeting with our sponsor, Alyssa Tsukada, on October 6, 2023. This helped us identify three pilot labs to send a finalized audit to at the end of the quarter, as well as outline questions we planned to ask in each interview that would be conducted with the professors, instrument specialists, or Sustainable Office Certification creators we planned to meet with. These questions included each lab's current practices that cannot be changed or adjusted despite being unsustainable, places in the labs where the specialists *did* see room for sustainable improvements, and potential roadblocks to certification implementation. Notes from each interview are provided in Appendix A, where all questions and their associated answers are provided.

a) One interview was conducted with Professor Manual Montaño on October 20, 2023, who runs a toxicology lab.

b) One interview was conducted with Cassi King and Alyssa Tsukada on October 26, 2023, who are instrument specialists in SciTech's optical microscopy lab.

c) One interview was conducted with Sarina Kiesser on October 26, 2023, who is an instrument specialist for SciTech's instrument center, which is a wet chemistry-oriented lab space.

d) One interview was conducted with Linda Sterling and Maia Heffernan on October 29, 2023, who both worked to create the Sustainable Office Certification on campus.

We also interviewed the Green Labs Coordinator at the University of Alabama Birmingham on November 6, 2023. The focus of this interview was more specific, as we were mainly concerned with learning about their glove recycling program. While unlikely to implement the same program at Western due to differences in our University's budget, the meeting was insightful regardless, and our notes from this meeting can also be found in Appendix A.

Based on the information gathered in each of our interviews, our group began creating a self-audit to send to each of the instrument specialists or professors associated with each of our three pilot labs. Our group went through several drafts before finalizing our audit, and each draft was reviewed by our sponsor to ensure we had proper phrasing of questions, scoring of answers, and even adequate resources linked to provide further information in each section. We finalized our self-audit and sent it to each of our three selected pilot labs on November 13, 2023. By early December, each lab had completed the audit, and we got to work analyzing the results. Two of

the pilot labs, the Toxicology Lab and the Optical Microscopy Lab, earned a Silver Ranked Certification and the SciTech Wet Chemistry scored Bronze.

Methodology Explanation

Our interviews were conducted with professors, Sustainable Office Certification creators, and SciTech instrument specialists recommended to us by our sponsor, Alyssa Tsukada. Alyssa recommended we interview those in charge of running three “pilot labs”: an optical microscopy lab, a wet chemistry lab, and a toxicology lab. These particular labs also make good pilot labs because they’re “teaching labs”, so they’d be able to spread great awareness about sustainable lab practices to other labs students may work in even after graduating from Western. Our interview with Linda and Maia was intended more for our group to learn where to begin when drafting our certification checklist, how to encourage labs on campus to become Sustainable Lab Certified, and a few pieces of advice to consider when drafting our self-audits and final certification checklist.

The questions on the self-audit are designed as a result of the information gained by our group through the conducted interviews and outside research. One of our biggest takeaways is that every lab will likely have different sustainable practices that either can or cannot be implemented, so we’ve aimed to design a self-audit that can be given to every lab, regardless of its unique circumstances, and still provide our group with the necessary information we need to begin working on our final Sustainable Lab Certification Checklist. We have chosen to utilize a checklist as a means of certifying science labs across campus because that is primarily how the Sustainable Office Certification has begun being implemented. Because of the clear similarities between the two certifications, this seemed like the most straightforward and effective strategy.

Results

The initial results of our project show promise in terms of labs’ willingness to participate and ability to complete the audit (See Appendix C). We had three members of SciTech’s labs, Sarina Kiesser, Cassi King, and Alyssa Tsukada, work together on filling out audit copies for SciTech’s optical microscopy and wet chemistry labs. Professor Montaño also shared his results with us after filling out the form for his Toxicology lab. The feedback we gained was invaluable in the development of the audit, as we received many notes and clarifying questions from the auditees. Most strikingly, there was a miscommunication about the form of the audit itself with the SciTech auditees. We created individual Google Sheets forms for each lab, but failed to inform Sarina, Cassie, and Alyssa that they should fill out these specific sheets. Instead, they downloaded the form to an Excel sheet, which unfortunately led to issues with the formatting, such as adding “Yes" and “No” options in the drop-down menus, and breaking the form’s ability to automatically calculate scores. Although they experienced these mishaps, our participants

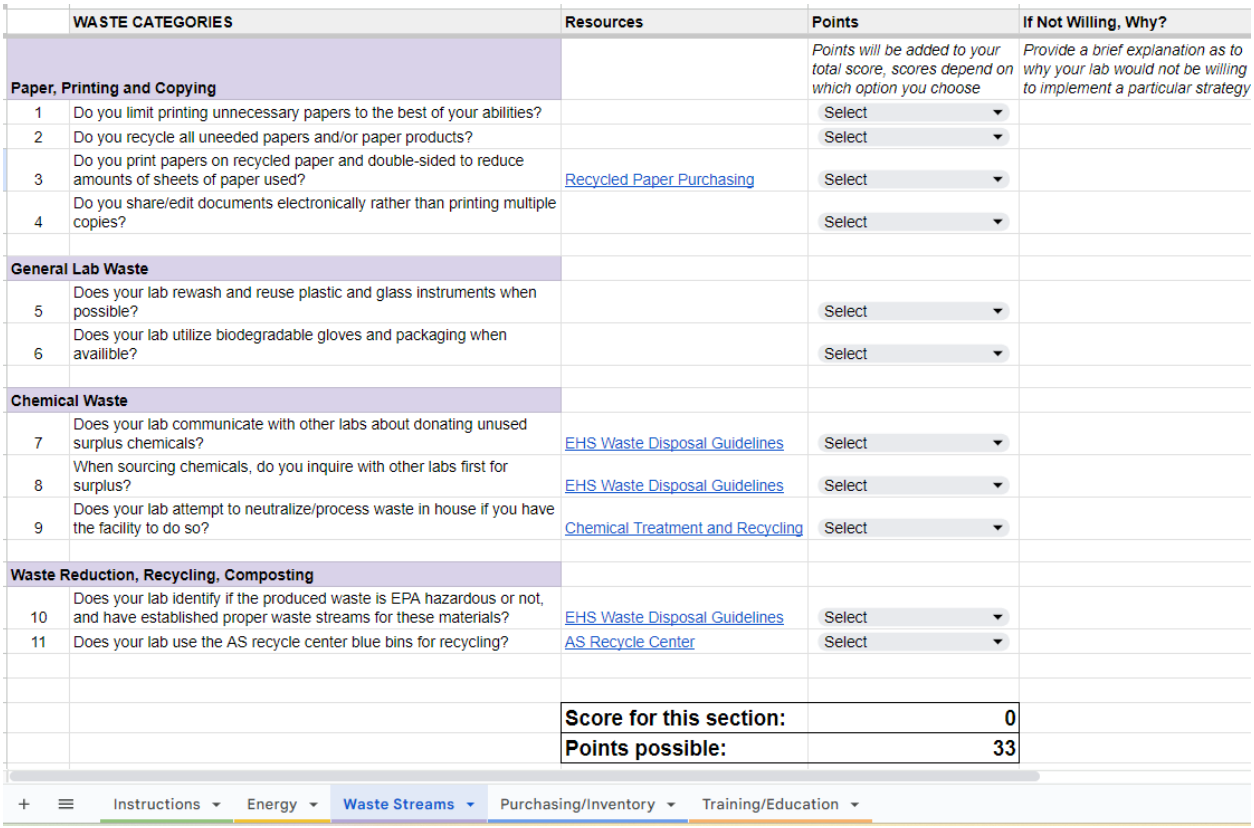
shared their excitement about the project and were still able to complete the audit. Because they all have vast experience with labs, they were able to provide us with suggestions for rephrasing questions so that more labs are able to receive points. After manually calculating the scores, the Microscopy lab scored 79 out of 105 possible points, putting them at a silver rating. The Wet Chem lab had a lower score as they failed to fill out one of the sections, receiving 63 out of 93 possible points, or a Bronze ranking. Professor Montaño's lab scored 76 out of 126 possible points, or a Silver ranking. Because of the technical difficulties they had filling the sheet out, we plan on allowing these labs to recertify. For future recommendations, we suggest incorporating percentages into the score rankings to improve fairness. Currently, questions that aren't applicable to the lab being audited (any questions marked 'Not applicable'), are excluded from the 'Points Possible' count. Knowing that larger labs with more technology are able to score higher, we suggest that they are scored by the overall percentage of points to points possible instead.

Categories	Points	Points Possible
Energy	0	48
Waste	0	33
Purchasing/Inventory	0	30
Training/Education	0	21

Total points:	0
out of	126

	Points Required	
Level	Min:	Max:
Bronze	44	65
Silver	66	87
Gold	88	109
Platinum	110	126

Figure 1. Score sheet on the 'Instructions' tab, with the scorecard and ranking chart. (Source: Google Sheets)



	WASTE CATEGORIES	Resources	Points	If Not Willing, Why?
Paper, Printing and Copying			*Points will be added to your total score, scores depend on which option you choose*	*Provide a brief explanation as to why your lab would not be willing to implement a particular strategy*
1	Do you limit printing unnecessary papers to the best of your abilities?		Select	
2	Do you recycle all uneeded papers and/or paper products?		Select	
3	Do you print papers on recycled paper and double-sided to reduce amounts of sheets of paper used?	Recycled Paper Purchasing	Select	
4	Do you share/edit documents electronically rather than printing multiple copies?		Select	
General Lab Waste				
5	Does your lab rewash and reuse plastic and glass instruments when possible?		Select	
6	Does your lab utilize biodegradable gloves and packaging when availible?		Select	
Chemical Waste				
7	Does your lab communicate with other labs about donating unused surplus chemicals?	EHS Waste Disposal Guidelines	Select	
8	When sourcing chemicals, do you inquire with other labs first for surplus?	EHS Waste Disposal Guidelines	Select	
9	Does your lab attempt to neutralize/process waste in house if you have the facility to do so?	Chemical Treatment and Recycling	Select	
Waste Reduction, Recycling, Composting				
10	Does your lab identify if the produced waste is EPA hazardous or not, and have established proper waste streams for these materials?	EHS Waste Disposal Guidelines	Select	
11	Does your lab use the AS recycle center blue bins for recycling?	AS Recycle Center	Select	
		Score for this section:	**0**	
		Points possible:	**33**	

Figure 2. “Waste Streams” tab of the audit. (Source: Google Sheets)

Recommendations

It is unrealistic to expect the creation and implementation of a campus-wide program within a single quarter. We have devised a plan outlining future steps to ensure the continued success of the Sustainable Lab Certification on Western’s campus, extending beyond initial measures to become a standard for all labs. The first recommendation is to host quarterly meetings in conjunction with SciTech and their advisory board, which includes members from each college at the university, and other stakeholders that may be interested. These meetings will help spread the word about the Certification and other’s experiences with it. Quarterly meetings will also be important for lab managers and grad/undergrad students who rotate in and out of labs on a quarterly basis. These meetings will serve as opportunities to attract new participants, provide a platform for checking audit progress, and discuss lab improvements. Since Western Washington University does not have a set budget or plan for this kind of Certification, as other universities do, these meetings with SciTech will help set the Sustainable Office Certification as

a norm throughout all colleges on campus. The overarching objective is to expand the program to all of Western's labs, which will mean auditing different types of labs beyond our initial three. The audit spreadsheet may need to be adjusted to accommodate other types of labs, such as computer science labs that don't have a wet chemical element. Interviews will be conducted to discern nuances within different lab types, ensuring audits cover a spectrum of scenarios. The aim is for all labs to achieve Platinum status, and comprehensive audits will prevent any lab from being left behind in the process. Labs can reach Platinum status by receiving a score from the Sustainable Lab Audit that meets the threshold for a Platinum score.

Receiving funding will always be the main challenge for labs, especially research labs which have to apply for grants and funding. We do not want to discourage labs from joining the Sustainable Lab Certification due to a lack of funding or the ability to implement sustainable changes. A program exists at Western called the Sustainability, Equity, and Justice Fund (SEJF Grant), where students pay into a pool of money each quarter that they can then apply to and receive grants to implement a variety of different projects on campus. Some examples of previous SEJF projects include the installation of solar panels on top of the Environmental Studies building and the program for free menstrual products on campus. Our next recommendation would be for group members Megan Ellis and Alyssa White, who are continuing the project, to apply for a SEJF Grant to help labs overcome the initial cost of becoming more sustainable. This grant can be used to order more sustainable supplies, start chemical or equipment cleaning and recycling programs, and alleviate any stresses that may come with trying to implement a completely new program at Western.

The final recommendation for the continuation of the Sustainable Lab Certification at Western includes a completed webpage with all the information and resources needed for a lab to complete its own audits. Many other universities have established Sustainable/Green Labs that include websites with general information as well as resources for other sustainability programs that exist on campus, for example, the University of Alabama Birmingham has a glove recycling program and forms to become a part of that program are hosted on its Green Laboratories webpage. This webpage can also host the existing data for the audits such as leaderboards, who's making the most improvement, applications for SEJF funds, and new ideas for future Sustainable lab practices. Having one spot for everyone to go to will help streamline the process and make sure that everyone has access to what they need. This website would be set up by a temporary part-time student or added to a SciTech position.

Our sponsor Alyssa Tsukada has been incredibly helpful and supportive throughout this quarter and is an ideal advocate for the Sustainable Lab Certification beyond the current

timeframe. Alyssa works for SciTech, a neutral scientific lab group that helps provide access to advanced scientific instruments, training on multiple different instruments, and supports research and labs across the entire university. Recommendations for our sponsor to continue the implementation of the Sustainable Lab Certification include: promoting the program to other SciTech faculty and board of directors, hosting meetings about the SLC, and talking to other lab managers about how to implement the SLC. Since two of the labs that SciTech has will be a part of the initial audits, our sponsor will know what to do and what to expect and will be able to reliably speak on the process to those who may have questions. In order to fund the extra work SciTech will need to complete we propose the SEJF Grant cover the costs of increased responsibilities of SciTech.

A reasonable timeframe to establish quarterly meetings, a web page, and integrate SciTech's role in hosting and promoting the SLC would occur over this upcoming year and next. Team members Megan and Alyssa will be working with SciTech to apply for an SEJF Grant as well as assist in organizing promotional meetings. We hope to potentially hire a temporary (one year) student position to help organize the website and other necessary functions for implementing the SLC. The costs of the student employee and website would be covered by the SEJF Grant.

The goal of sustainability is to preserve our planet, protect it for future generations, and fight against climate change. Western Washington University is not a self-running isolated institution, it is part of the greater Bellingham area and connected to other universities across the United States and other countries. Students who go to Western will graduate and go on to make real impacts and changes in the world. Understanding that we are a part of something greater than just ourselves will help establish connections with people on the other side of town and the other side of the planet. Establishing sustainability in the context of scientific labs means being specific to Western's wants and needs as well as applications in a much broader Sustainability context. A way this can be done is through the United Nations Sustainable Development Goals. Our future recommendations directly link to three of the seventeen goals that the UN created to promote the preservation of our world for the future and fight against poverty. The first goal is #9: Industry, Innovation, and Infrastructure. In order to promote sustainability innovations need to be done, examples of this in a lab setting can be lowering temperatures of Ultra Low Freezers from -80C to -60C, saving energy, or just switching to more efficient options if the current ones are detrimental. Other innovations to the lab industry can include recycling programs for single-use equipment or gloves, this may be a large endeavor for a small university like Western, but other schools have had success in doing so and should be looked to as an example. The second applicable goal is #11: Sustainable Cities and Communities. As stated before, Western

Washington University does not exist in a vacuum, the students and faculty are members of the Bellingham and Whatcom county communities and what goes on at the university can reflect what is happening in town. Promoting sustainable labs and other spaces on campus can in turn promote sustainability practices to the public and other non-university groups such as private research labs. The third goal is #12: Responsible Consumption and Production. Labs use and produce immeasurable amounts of equipment and chemical waste, and finding alternatives to throwing everything directly in the trash is a good first step. Practices such as cross-department communication for ordering, sharing, and reusing equipment and chemicals can help reduce duplicate orders or unnecessary waste.

Figure 3. United Nations 17 Sustainable Development Goals. (United Nations, 2016)

Monitoring and Evaluation

Tracking Success

We plan to track the success of this project by seeing how many labs on campus attempt to pursue a Sustainable Lab Certification in the quarters following the certification of our pilot labs. If by the end of this academic year, all three of our pilot labs become Sustainable Lab Certified and one or two more labs show interest in becoming certified, our project will be considered successful.

Future Tracking

To ensure that Sustainable Lab Certified science labs continue their sustainable practices far into the future and not just after receiving their certification, we propose each certified lab conduct a reevaluation each year following their certification. We chose an annual recertification instead of a quarterly recertification because we see it as frequent enough to hold labs accountable for maintaining sustainable practices while also not overburdening them with more responsibilities of recertifying every quarter. This will include reviewing their submitted checklist that earned the lab its certification and ensuring all sustainable requirements are still being met. Each year that a lab retains its certification, a decal with the current year shall be awarded to the lab to be displayed prominently. This will allow us to have a visual representation of how many years each lab has been conducting sustainable experiments.

Budget

Budget Item	Marginal Cost	Quantity	Total
Year 1			
Compost Bin	$19.97	10	$200
Disposable Gloves Zero Waste Box	$95 (one time order)	30 (one per lab per quarter)	$2850 per year
Pipette Zero Waste Box	$95 (one time order)	30 (one per lab per quarter)	$2850 per year
EcoPipette	$146	20	$2,920
Advanced Power Strips	$30	10	$300
Ongoing Annual			
Student Project Managment Position	$17/hr	5hrs/week	$2,550/ year for 30 wks work (3 quarters, 10 weeks per quarter)
Total			**$11,670**

Conclusion

Through our work this quarter, we conducted research, administered interviews with lab managers, and got an in-depth tour of our pilot labs here on Western's campus. This effort culminated in the creation of our final deliverable, a comprehensive spreadsheet titled "Sustainable Lab Certification." We gauged the potential success of our project by assessing our ability to conduct complete lab audits on the specific labs we had initially chosen. These were the SciTech white chem lab, the SciTech optical microscopy lab, and Professor Montaño's upper-level toxicology lab. Through interviewing our lab auditees, we were able to incorporate feedback into our initial audit drafts and feel confident in the future success of this project.

Overall, our results showed promise, with our SciTech labs scoring a Silver and Bronze certification. Additionally, the Toxicology lab also scored a Silver certification. We plan on

having labs recertify annually, to provide opportunities for improvement as well as promote the certificate itself. Through this project, we gained hands-on experience in developing guidance for community sustainability efforts. We also ended the quarter with a deep understanding of the functioning of our team and a strong communication ability, both with other lab managers and the team itself. By having an initial discussion of our strengths and weaknesses before we began the project, we were able to handle unexpected situations with grace and show appreciation for each other's efforts. Ultimately, our vision for the Sustainable Lab Certification extends beyond our immediate efforts this quarter. We aspire for this project to become a cornerstone for labs across campus, fostering active engagement and evaluations for every type of lab. We plan on continuing to promote this project in our remaining time here at Western and are excited to see where it goes. In sum, this project is poised to make a substantial and enduring impact on the community. The skills we learned from this project will be carried into future work as we move towards careers in sustainability.

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Appendix A- Interview Notes

Initial Sponsor Interview - Alyssa Tsukada (10/6/23)

- Where is the current status of the project?
    - What is provided is what we have: Lindsey approached Alyssa with the idea at the start of summer, but the project needs capacity (students).
- What's a good starting point?
    - Create a basic checklist of what we'd be auditing for, how the auditing process goes, what the checklist is, who we are choosing to audit
    - The main categories we're looking at and reasonings for them
    - Completely optional program for all labs
        - Easily accessible, promotable, not intimidating
        - Strive for easy while as sustainable as possible-- want them to say yes!
        - Social pressure -- no one knows what stars are (quantitative metric)
        - Figuring what areas of sustainability to apply to labs
- What is the scope of this project? Are we aiming to have one certification that is applicable for all labs on campus (chemistry, biology, physics, engineering, geology, compsci, ESCI, etc.)
    - Basic checklist, research into what labs are applicable, revisiting checklist, how to do audit
    - Looking at different resources, what they're looking for in sustainability, creating the checklist, then looking at what different lab spaces we want to audit, see if the checklist still applies
    - If the checklist doesn't apply, how to adapt it, not bite off more than we can chew and maybe start with just one lab and go from there
- Do you have any contacts already established in these departments?
    - Board of faculty members from invested depts/colleges, approves user agreements, ensures equity in policies/etc
    - Professor Montaño's Toxicology/Chemistry lab (working with nanoparticles)
- Is this project looking at computer labs, wet labs, or both?
    - Scitech has office space and 3 different types
        - White Chem lab-- white gold, the base structure of what a lab looks like
            - Has instrumentation, fume hood, chemicals
        - The optical microscopy lab in Bond basement has instrumentation but no sample prep, people prep samples in the room, no chemical storage/fridges
            - Instrumental lab (probably won't apply)
- Labs that are a priority or need extra help?

    - Sci-Tech: department on campus independent from colleges
    - Houses scientific instrumentation, neutral ground for any large scientific instrument, grants from multiple colleges to share the instrument
    - The goal is to serve and support research equitably across campus regardless of college, department, etc.
    - They can help with method and data analysis and all that stuff
    - Bare minimum end goal- audit of SciTech itself
- What is important for us to know about your working style and availability?
    - Alyssa was generous enough to offer to meet during our class time if necessary, as well as on Fridays. She also shared with us that we can contact her via email at any time.
- We have to do audits on 3 different labs-- do you have recommendations or things we should consider in choosing them?
    - We will do an audit of Sci-Tech-- to demonstrate to the rest of campus because they are known by all departments in research, a good starting point in amplifying the project.
    - End with a successful final audit of at least Sci-Tech white chem lab
    - Getting one independent lab/professor's lab on board who have their own space and students, doing an audit of them
- What do you think the biggest obstacle will be in getting our labs sustainability certified?
    - Communicating with people (we will do weekly check-in emails on Thursdays)
    - Use Alyssa as a resource if people aren't responding-- we have a staff member backing this!
    - EHS
        - Sustainable chemical waste practices are outlined in EHS so working with those guidelines.
        - EHS is faltering at Western: low staff, can be hard to communicate with
        - Less likely to prioritize emailing students -- job is disposing of waste
    - Managing the short timeline and balancing work/school/life in a healthy way.
- Do you have an opinion on what any labs' current most unsustainable practice might be?
    - Other campuses- self-audit of "Do you follow EHS guidelines" Everyone *should* say yes, we'll need to go further and focus on how to use the language to ensure they actually do follow the guidelines.
    - The most unsustainable practice is turning technology off when done using it and back on when needed
    - Instrumentation, computers, something running overnight, energy waste. This may be hard to combat because science is wasteful.
- What stakeholders are there in this project?

- Staff and faculty in Sci-Tech
- Research faculty members vs support staff (Alyssa's role)
- Lab coordinators are the ones who keep the stockroom, do specific instrumentation, and at another level, and are good to talk to to get input (may not do audits but are very involved)
- Other stakeholders: Students involved, people passionate about it, grad students, undergrad.
- EHS folks, facilities, building operational sustainability- waste drains, energy drains
- Sci-Tech resource: Board of faculty members from invested depts/colleges, approves user agreements, ensures equity in policies/etc
- A good resource for the main point if what we do doesn't work, we can ask them for suggestions (down the line, a few quarters in)
- We should appeal to the board

Sustainable Office Interview- Linda Sterling, Maia Heffernan, Lindsey MacDonald (10/19/23)

- Where did you start with your certification creation? (Maia)
  - had a template-- scoresheet is updated version of almost identical scoresheet, changed some tasks to be more applicable to life at western now
  - the original SOC was put on hiatus in 2018, it was a program w/ its own manager
  - COVID disrupted
  - created the scoresheet, talked to people across university (Amanda Cambry) (Rich Nyer, recycling stuff) talking to experts in each field
- What were your motivators or first steps?
  - Sustainability ethos on campus, not everyone knows
  - "I care about sustainability but how does that translate to every day work"
  - This tool helps people with specifics, eg. purchasing and events, a toolbox to make decisions and behave in a way that aligns with values
  - ADEI tab-- incorporated into actions w/in spreadsheet
    - Participation tab
    - Well-rounded
- What were some barriers you found to creating the certification?
  - Ppl were excited this was happening-- no pushback
  - Connects different players across university
  - Challenges: contacting folks and creating feasible goals
  - Some aspects became unrealistic-- have to drop X in favor of Y with complications

    - Waste- composting vs non composting
        - changing technology, IT at university, settings have been optimized
- What are best practices vs standard practices-- moving target
    - for us: working with EHS around waste/safety/proper waste disposal
    - in terms of working with an outside contractor, that contractor has specific rules
    - Laptop vs desktop- life cycle, double monitor, added details etc. Nuanced details
    - Education more important than defining black/white
    - Worked with zero waste to present to offices (no capacity)
    - Struggle to educate EVERYONE due to changing personnel and #of people
    - Energy sector is a huge amount of points, have to balance other categories, waste, food, etc to make all aspects important
    - Spreadsheet is as comprehensive as possible-- events tab doesn't apply to all offices
    - quantitative metric must think about variability of lab spaces
    - no negative points if it doesn't apply
    - UW did not focus on education because of huge size
    - WWU has the opportunity to be more personal
    - Maia recommends looking into UW lab certification program -- theirs has been in place for a while
- What would you say is the overall success rate of this program? / Anything you would do differently to make it more successful?
    - *OUTREACH* is the biggest part
    - years spent developing scoresheet/certification
    - still presenting it
    - a lot of ppl don't know about it
    - No data on success rate yet
    - The lab committee/council will be KEY as early adopters
    - Linda plans on sending outreach email to all faculty, new presentation, still in the process of outreach
        - Could send out email to lab faculty/staff or SciTech board
    - Peer-to-peer sharing has huge impact
        - Pilot labs can spread info,
    - Maia wrote an SEJF grant to obtain materials-- compost buckets & bags for offices, LED lightbulbs
    - Big barriers were office budgets (LAB BUDGETS)
    - Starter gift baskets/toolkit
    - Hank switched power strips (turn off tech after idling)

    - Lindsey recommends grant/SEJF as a good incentive for the program, tight budgets
    - Decent pitch to SEJF, compile list of what is needed for the toolkit
        - Less than $5000 is a quick process, significant amount of writing
    - Maybe we get to a part of identifying needs, recommendations. Next step would be a grant
- Is there anything we should keep in mind when creating our certification?
    - Keep up outreach/commnication
    - Newsletter
    - Regular features
    - Make sure people don't forget!
    - Next steps for after the quarter
- What are struggles with user implementation of the SOC?
    - Linda currently administers program and working on the relaunch, created unit Employee Survey-- team leads might not have the answers to some questions on the scoresheet -- spreadsheet for unit managers to give survey to staff
    - Thinking about shared lab spaces-- point person might not know all uses of the lab but lab managers generally know.
    - Linda's experience using the scoresheet led her to do the survey of the unit, is working hard to get office rating up for the sustainability office.
    - Developing website badge
    - Other incentives besides badge?
    - discussion of quarterly party for all certified offices
    - Certification serves as a connector for sustainability advocates who aren't in sustainability career. Community events-- quarterly pizza, a way to bring them together.
    - A way to build community
    - Big goals
    - University's STARS rating if we get high participation, it could push us from silver to gold nationally
    - Pride
    - better rating = better we're doing as a whole
    - Lab certification is a part of STARS
    - Ask sci tech board how lab managers communicate with each other so we can get this out beyond the committee group
    - campus wide emails through ATUS list serve
    - Pilot labs celebration / Early Adopters Pizza Party
    - Scoresheet:

        - Prereqs with bare minimum from each category
        - Auto populates score
        - sustain.wwu.edu/sustainable-office-certification-soc#Application
        - Paid external service to do lab certification (use their checklist as a starting point) to make it Western specific
          Merging two things vs creating whole thing on our own
        - develop whole section for scientific purchasing
        - specific vendors in marketplace for scientific tools
        - My Green Lab certification-- mygreenlab.org Worth a look

Lab Interview- Professor Montaño (10/20/23)

- What does your lab do?
    - Environmental analytical chemistry
    - Specifically: Run experiments, use AMSEC/SciTech instruments
    - Examining impact of nanoparticles: polymer additive leeching
    - Dealing with microplastics
    - ICEMS used for analyzing concentration/composition of metals
- What makes it unique/similar to other labs on campus?
    - A lot more trace analysis, looking at compounds/chemicals/concentrations on part per trillion levels (nanograms per liter of material)
    - Pretty clean, must avoid contamination and cross contamination
    - Other labs do fuel work: they bring fuel sample analysis in
    - Chemical waste
- What are your lab's current sustainable practices?
    - Current strategy for chemical waste:
    - Separate into aqueous and organics
    - Organics = hologenated or non-hologenated (missed definition
    - Goal is to avoid mixing chemicals
    - Knowing waste container type is important -- can't use plastic with organics
        - Pretty standard for a chem lab
    - Currently: Nothing goes down the drain except water
    - 10 liters of acid waste generated once every 3 months
    - Unlikely to go back to previous strategy
    - Full trash can of waste per week
    - Priorities for tox lab: single waste, chemical waste
- Where do you see the most room for improvement in your lab's sustainable practices?
    - Would like more guidance on consumable use

    - More data on viability of reusing single waste consumables
    - Would like a well-researched document on contamination
- What is your motivation for wanting to participate in a Sustainable Lab Certification?
    - frustrating to be in a field that generates a lot of waste
    - electronics, energy dashboard-- 2 million/year in energy cost
- Do you have your own practices that promote sustainability and participation in the Certification process?
    - turn off/unplug things
    - fridge is constant power use
    - turbo pump
    - during summer- have to have AC on constantly for instrument health and etc
- What do you see as the biggest challenge in implementing this lab certification?
    - Consuming
    - If there was a way to have tubes cleaned prior to disposal /enough to be recycled
- What are aspects of your lab's sustainability that cannot be changed? (Budget, EHS Regs, changing equipment)
- How do you communicate with other labs in/out of your department?
    - Does not communicate with other labs
    - Would promote sustainable lab certification- "so what" ?
    - Individual research labs not as connected or motivated
    - talk to ES lab coordinator

Lab Interview- Cassie King (10/26/23)

- What does your lab do?
    - Standard light microscope to fluorescent laser scan microscope
    - Purpose is to be a teaching lab
    - chem classes, undergrad research, grad/faculty research, from behavioral NS to geology, wide range of research
    - Functionally other labs have similar tools
- What makes it unique/similar to other labs on campus?
    - Specifics of the instruments is unique to this lab
    - Confocal in biology; only one Ramen
    - dissecting scope to paralyze worms
    - Fumehood is not used
    - However, practices around sample prep for some experiments can be similar (mainly bio, few exceptions)
- Currently, what does your lab do to minimize its effect on the environment?

    - Struggles with communication between janitorial staff/facilities for waste stream disposal
    - Cassi/alyssa have to take out recycling themselves to the blue bins.
    - What they can recycle: paper
    - Go thru a lot of chem wipes which are not recyclable
    - Risky with students misplacing pipette tips
    - Janitorial staff not aware of what is recyclable and not
- Where do you see the most room for improvement in your lab's sustainable practices?
    - Communication about waste management and janitorial staff
    - Hhaving more guided streamline process, links to correct EHS signs, quick folder with the EHS signs
    - Too hopeful to involve facilities, but at least set up a guide
    - This will help consistency between labs for students
    - Broken glass gets thrown in glass
    - Understanding what different waste streams exist, what they look like, SIGNS!!!
    - Biohazard, sharps, glass waste streams for each instrument
    - Autoclave in bio building before going to landfill
    - Sci tech is really small department and doesn't have its own autoclave
    - Centralize existing documents and resources
    - John Fauver- director of EHS
- What is your motivation for wanting to participate in a Sustainable Lab Certification?
    - Cassie has worked in a lot of different labs, seen varying degrees of mass amounts of waste being produced
    - Working at a national laboratory had lots of money and no incentive to reuse
    - Teflon beakers are really expensive, can withstand heat, reused at undergrad lab, thrown out at national lab
    - more expensive to pay someone to clean than to buy a new one
    - is cleaning more sustainable?
- What practices do you have in your lab that you would consider to be sustainable?
    - Reusing glass tubes
- What do you see as the biggest challenge in implementing this lab certification in your particular lab?
    - People into the idea, but actually getting them to follow through, may not be proactive in making the time to do it. Following up, deadline, accountability important.
    - Has to have follow through, recertification process
    - Show new lab members the checklist, have it posted, seals to put on door

- What are aspects of your lab's operations that cannot be changed? (Budget, EHS Regs, changing equipment)
    - Instruments have to be on all the time, old material if replaced maybe doesn't have to be on all the time
    - Running helium gas through it, there's a helium shortage, uses small amounts
    - New instrument could use hydrogen instead of helium
    - Lack of budget, prioritizing lifetime of instrument
    - Can't change chemicals or gas usage
    - They could turn the fumehood off
    - nanopure filter water
- How do you communicate with other labs in/out of your department?
    - Not much communication
    - Sci tech reaches out to every department at the start of the quarter
    - User groups from diff departments are the stakeholders in the instruments
    - Advisory council has stakeholders from different departments
    - Open houses per quarter this is a good opportunity to promote
- What do you see as potential options for your lab to reduce waste? In turn, where in your lab do you see the most waste produced and energy used?
- Suggestions for starting audit:
    - Break into office operations, ordering all in one order or different orders, specifically energy, turn off lights/fumehood, and waste/chemical hazards are separate from waste streams
    - Having a scale-- do this most of the time, sometimes, don't do it
    - How do they communicate info to users

Lab Interview- Sarina Kiesser (10/26/23)

- What does your lab do?
- What makes it unique/similar to other labs on campus?
- Currently, what does your lab do to minimize its effect on the environment?
- Where do you see the most room for improvement in your lab's sustainable practices?
- What is your motivation for wanting to participate in a Sustainable Lab Certification?
    - Science industry is not green or eco friendly
- What practices do you have in your lab that you would consider to be sustainable?
- What do you see as the biggest challenge in implementing this lab certification in your particular lab?
    - Easy; excited lab!
    - Labs unwilling to change: stubbornness

    - Enough open-minded people
- What are aspects of your lab's operations that cannot be changed? (Budget, EHS Regs, changing equipment)
    - Machines have to stay on
    - Chemical hood can maybe be turned off
    - Look into different types and levels of hoods
    - Understanding what hood
- How do you communicate with other labs in/out of your department?
    - Sarina has ideas of what labs will be good to try this out
- What do you see as potential options for your lab to reduce waste? In turn, where in your lab do you see the most waste produced and energy used?
    - Clean and reuse pipette tips
    - Purchasing option of pipette tips that don't go in the garbage
    - Unsure if they even are recyclable
    - Most traditional lab space, have multiple different waste streams and hoods
    - Most labs request facilities to not come into labs, lab safety training
    - Office vs laboratory-- laboratory recycling = chemical containers being reused/recycled
    - Put emphasis on lab recycling
    - Reuse chemical containers as waste container
    - Empty containers are recyclable
    - Are there things labs could be recycling/reusing/purchasing different recyclable option?
    - Sarina recommends speaking with EHS if something that held toxic chemical can be recycled or is considered toxic. once empty is recyclable
    - Acids stored in big glass jugs reused for waste stream
    - EHS has chemical waste person who schedules a pickup, hazardous waste collection site on campus, consolidate materials, biweekly or bimonthly
    - Works with Clean Harbors, contractor that disposes with hazardous waste
    - Wish for a true understanding of recycling in Whatcom county-- what they require, what they accept.

University of Alabama Birmingham Green Labs- Emily, Green Labs Coordinator (11/6/23)

- Emily – Green Labs Coordinator (Univ. Alabama Birmingham)
    - Works full time for university, not a student
- Glove recycling program
    - Started with students! Student intern in the Office of Sustainability

    - Gloves and other hard-to-recycle items
    - Any lab that wants to participate in recycling must be a certified Green Lab
        - Presentation and meeting about how the process works
        - Saves energy and water > saves money - justify paying extra for recycling services
    - Requirements for glove recycling
        - Reach out to EHS ("pilot program" to encourage new implementation)
        - Any lab that wants to participate must be approved by EHS (biohazard risks)
        - EHS will know which labs are repeat offenders for violations
        - Different colored gloves to know what they come in contact with and what can be recycled (gloves that deal with hazardous waste are black, so they cannot be recycled, etc.)
        - Pre-approved glove recycling containers
        - On-campus recycling process, a team of interns who work there
        - Glove recycling companies will provide a box for gloves to be put in, sent back to the company to be recycled (UAB is large, so on-campus processing before pickup is preferred)
        - Up to the lab if they want to participate, but they can if they want to if approved by EHS (standards for glove recycling will vary by campus EHS)
- Single-use waste within labs
    - No composting facilities in the state of Alabama
    - Not many companies that sell sterile (individually wrapped) supplies in compostable packaging
    - Encourage buying in bulk and consolidate orders (cons: hard with time constraints and $$)
    - Will recycle anything that would otherwise go into a landfill (if it can go in a landfill, it can go in recycling)
    - Take note of recyclable numbers
    - Consolidate orders to reduce packaging
        - Amazon is good at consolidating packaging
    - Can reuse petri dishes! Additional steps required
        - Work closely with EHS from beginning – "This is how we help you, EHS"
        - ***Additional steps being sent via email***
    - Purchase more sustainable products (encouraged)
        - Labs should use ACT database from My Green Lab – nutrition label telling show environmentally friendly it is

        - Not many things are currently ACT-certified, but new things are being added
        - Encourage researchers to purchase from sustainable companies/recycled contents
            - (Polycarbon – make pipette tip boxes, etc. from lab items – fairly price competitive)
            - Univ. A sends Polycarbon their pipette tip boxes to turn into new pipette tip boxes
- My Green Lab with funding to start a green labs program (SEJF grant to provide funding)
    - https://www.mygreenlab.org/green-lab-certification.html
    - Save money in one area and use that saving to reinvest it in another energy-saving area
    - https://www.mygreenlab.org/freezer-challenge.html
    - Autoclaves on 24/7 – $60k to $80k
        - Priorclave: company that sells non-steam jacket autoclaves designed specifically for research
        - Autoclave: steam/pressure/temp sterilization
- What does the lab want to save money on?
- Univ. Alabama has found that researchers and product design teams don't really talk, even though they should be!
    - What equipment is actually needed in the new building (4 autoclaves/floor vs 1 autoclave/building)
- IISL – International Institute for Sustainable Laboratories
    - https://www.i2sl.org/?gclid=Cj0KCQiAuqKqBhDxARIsAFZELmJsV615R4OkW4QmG2D45KSPZeXNP3o1NG9xZd1KTCDLwJVFb9VIv6EaAmFFEALw_wcB
- CU Boulder: good Green Labs program

Appendix B- Lab Photos

Image 1. SciTech Wet Chemistry Instrumentation Lab (Source: Alyssa Tsukada)

Image 2. SciTech Optical Microscopy Lab, Bond Hall (Source: Alyssa Tsukada)

Image 3. Professor Montano's Toxicology Lab Fume Hood. (Source: Bela Alvarez)

Image 4. Single use syringes in single use packaging in Professor Montano's Toxicology Lab (Source: Bela Alvarez)

Appendix C- Audit

Categories	Points	Points Possible
Energy	0	48
Waste	0	33
Purchasing/Inventory	0	30
Training/Education	0	21

Total points:	**0**
out of	**126**

Level	Points Required Min:	Max:
Bronze	44	65
Silver	66	87
Gold	88	109
Platinum	110	126

Resources Included in Audit	
Sustainable Office Certification Audit	WWU EHS Waste Matrix
Glove Recycling at University of Alabama	AS WWU Recycle Guides
Power Down Guidelines	Chemical Treatment and Recycling
WWU Office Supplies	
Keeney's Office Supplies	
UTL Freezers	
FM Request	
Recycled Paper Purchasing	
EHS Waste Disposal Guidelines	
International Institute for Sustainable Labs	
AS Recycle Center	
Chimera Chemical Inventory	
ACS's 12 Principles of Green Chemistry	
My Green Labs Certification	

	ENERGY CATEGORIES	Resources	Points	If Not Willing, Why?
Lighting			*Points will be added to your total score, scores depend on which option you choose*	*Provide a brief explanation as to why your lab would not be willing to implement a particular strategy*
1	Do you currently turn off the overhead ceiling lights of the labs not currently in use?	Power Down Guidelines	Select	
2	Does your lab have reminders posted by exits to turn off lights?	Email sustain@wwu.edu for reminder sheets.	Select	
3	Are ceiling/desk lamp lightbulbs replaced with LED bulbs?	WWU Office Supplies	Select	
4	Is natural light in your lab utilized when availible?		Select	
Instruments/Machines				
5	Are Lab Analytical Equipment/instrumentation turned off when not in use?		Select	
6	Are fume hoods closed and turned off when not in use?		Select	
7	Are small electronics and appliances unplugged/switched off when not in use/at night?	Power Down Guidelines	Select	
8	Are old/unworking non-lab grade refridgerators and freezers replaced for more efficient options?	WWU Office Supplies Keeney's Office Supplies	Select	
9	Are lab sample fridges/freezers running at efficient temperatures? (ex: -60 vs -80 degrees Celsius)	UTL Freezers	Select	
10	Are computers and printers turned off overnight and before leaving for weekends, vacation and breaks?	Power Down Guidelines	Select	
11	Are lab computers optimized to use less energy?	Power Down Guidelines	Select	
12	Are non-lab freezers defrosted and cleaned once a year?		Select	
Heating/Cooling				
13	Are issues with thermostats in your lab reported?	FM Request	Select	
14	Do you close windows and doors when a heating/AC system is in use?		Select	
15	During cold weather, do members of your lab layer up first before using personal heating elements?		Select	
16	Is your lab willing to install blinds to reduce reliability on air conditioning during summer months?		Select	

Score for this section:	**0**
Possible points:	**48**

	PURCHASING/INVENTORY	Resources	Points	If Not Willing, Why?
	Chemical Purchasing/Inventory		*Points will be added to your total score, scores depend on which option you choose*	*Provide a brief explanation as to why your lab would not be willing to implement a particular strategy*
1	Does your lab conduct a chemical inventory at least once a year?	Chimera Chemical Inventory	Select	
2	Do you communicate with other labs to trade/use chemicals?		Select	
3	Do you work with other labs to bulk purchase chemicals?		Select	
	Lab Supplies Purchasing/Inventory			
4	Do members of your lab order through Marketplace, reduce packaging when possible?	Keeney's Supplies WWU Office Supplies	Select	
5	Do members of your lab communicate with one another when ordering supplies to avoid double-orders and excessive packaging?		Select	
6	Does your lab order bulk items when sterilized consumables are not needed?		Select	
	Office Supplies Purchasing/Inventory			
7	Does your lab purchase office supplies (including paper) with recycled content whenever possible?	Keeney's Supplies WWU Office Supplies	Select	
8	Does your lab purchase recycled toner cartridges and/or recycled & refillable dry erase markers?	Keeney's Supplies WWU Office Supplies	Select	
9	Do you communicate with other lab members to do bulk orders to reduce packaging?		Select	
10	Does your lab purchase have a designated area in our office for sharing reusable office supplies, such as file folders, binders, pens, paper clips, etc?	Keeney's Supplies WWU Office Supplies	Select	
		Score for this section:	**0**	
		Points possible:	**30**	

	WASTE CATEGORIES	Resources	Points	If Not Willing, Why?
Paper, Printing and Copying			*Points will be added to your total score, scores depend on which option you choose*	*Provide a brief explanation as to why your lab would not be willing to implement a particular strategy*
1	Do you limit printing unnecessary papers to the best of your abilities?		Select	
2	Do you recycle all uneeded papers and/or paper products?		Select	
3	Do you print papers on recycled paper and double-sided to reduce amounts of sheets of paper used?	Recycled Paper Purchasing	Select	
4	Do you share/edit documents electronically rather than printing multiple copies?		Select	
General Lab Waste				
5	Does your lab rewash and reuse plastic and glass instruments when possible?		Select	
6	Does your lab utilize biodegradable gloves and packaging when availible?		Select	
Chemical Waste				
7	Does your lab communicate with other labs about donating unused surplus chemicals?	EHS Waste Disposal Guidelines	Select	
8	When sourcing chemicals, do you inquire with other labs first for surplus?	EHS Waste Disposal Guidelines	Select	
9	Does your lab attempt to neutralize/process waste in house if you have the facility to do so?	Chemical Treatment and Recycling	Select	
Waste Reduction, Recycling, Composting				
10	Does your lab identify if the produced waste is EPA hazardous or not, and have established proper waste streams for these materials?	EHS Waste Disposal Guidelines	Select	
11	Does your lab use the AS recycle center blue bins for recycling?	AS Recycle Center	Select	

Score for this section:	**0**
Points possible:	**33**

	TRAINING	Resources	Points	If Not Willing, Why?
	Chemical Waste Training		*Points will be added to your total score, scores depend on which option you choose*	*Provide a brief explanation as to why your lab would not be willing to implement a particular strategy*
1	Do you provide training on proper Chemical Waste procedures when you get new lab members/ every year	WWU EHS Waste Matrix	Select	
2	Do you provide proper signage in regards to proper Chemical Waste disposal?	WWU EHS Waste Disposal Guidelines	Select	
	Recycling Training			
3	Do you provide training on proper Recycling procedures when you get new lab members/every year?	AS WWU Recycle Guides	Select	
4	Do you provide correct and up-to-date signage in regards to proper Recycling disposal?	WWU EHS Waste Disposal Guidelines	Select	
	General Waste Training			
5	Do you provide training on general waste procedures when you get new lab members/every year?	WWU EHS Waste Disposal Guidelines	Select	
6	Do you provide proper General Waste Signage?	WWU EHS Waste Disposal Guidelines	Select	
	Sustainability Training			
7	Do you discuss ACS's 12 Principles of Green Chemistry with new lab members/every year?	ACS's 12 Principles of Green Chemistry	Select	

Score for this section:	**0**
Possible points:	**21**