COVID-19 Workspace Safety Plan – Lab Specific

This workspace safety plan will assist Principal Investigators who wish to continue or resume research activities in their lab. This plan will include a review of activities to be undertaken in the lab to ensure effective controls are in place to prevent the spread of COVID-19. Principal Investigators are responsible for ensuring this document reflects current government guidance and notices which can be found, along with information about UBC’s response to the pandemic at https://covid19.ubc.ca/.

This plan must be reviewed by your Local Safety Team, and signed by your Unit Head/Director. Once complete, the plan can be submitted with your online application to return to research.

Resources to Consult
The following guidance documents and resources were used in the development of this plan:

- Preventing Exposure
- Personal Protective Equipment
- Physical Distancing Guidelines
- Reporting COVID-19 Exposure
- Communications Resources
- UBC Research Resumption webpage
- WorksafeBC

Section #1: Lab information

<table>
<thead>
<tr>
<th>Department</th>
<th>Mechanical Engineering</th>
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<tr>
<td>Faculty</td>
<td>Applied Science</td>
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<tr>
<td>Building(s)</td>
<td>Pulp and Paper Centre</td>
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<tr>
<td>Lab(s)/workspace(s)</td>
<td>Lab 116, 123, Lab 127, Lab 127a, office 321, 215 and 210</td>
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Introduction to Your Lab
Update to current workspace plan for PI James Olson. This plan involves 4 lab rooms in the Pulp and Paper Centre: 116, 123, 127 and 127a. 4 workers are included, but only 2 workers will be on campus at a given time to maintain current lab and building occupancy limits. Lab 116 contains the pilot plant for refining and screening equipment, lab 123 is the wet lab which contains pulp testing equipment and where the Innovate BC project chemical recycling of polyurethane will take place, lab 127 is the papermaking lab where there are several bench top pulp processing and testing equipment and lab 127a contains the paper testing bench top equipment. Offices spaces will be used to eat lunches separate from others. Two projects will work out of these labs: Energy Reduction in Mechanical Pulping program which will allow a few lab workers to complete projects on behalf of the graduate students and industry partners involved in the program and Innovate BC project to enable the project complete there year one report in order to receive the funding for and proceed with the second year of work.
Section #2 - Risk Assessment

1. Lab/workspace Occupancy (under proposed COVID-19 operations)
List the number of people that will be present in your lab/workspace at the same time. List this by every room/lab/workspace you occupy.

Confirm that you have discussed each employee’s comfort level with returning to work and have addressed any concerns, or will require further assistance in doing so. Any worker (staff, students, faculty, post docs, research associates, technicians and other research personnel) who has concerns about returning to work on campus can request an exemption to his/her supervisor.

- Lab 116: not frequently used. 2 people may be required to operate the pilot plant if trial work is required. The large size of the equipment will allow for proper social distancing when the 2 workers are using the machines. The maximum occupancy of the room is 5.
- Lab 123: 2 workers can be present in this room. The maximum occupancy of the room is 2.
- Lab 127: 2 workers can be present in this room. The maximum occupancy of the room is 3.
- Lab 127a: only 1 person is allowed in this room at a time. The maximum occupancy of the room is 1.
- Each of the office space (210, 215 and 321) will continue to permitted 1 person each.
- All of the lab spaces are shared labs. A worker will not be allowed to enter a lab if the maximum occupancy is already present in that space.
- Only one worker from Innovate BC project (chemical recycling of polyurethane foam) will work in lab 123: Reza Korehei (research associate)
- Only 2 of the 4 workers in this workspace plan will be on campus at the same time. The scheduling is described in Section 4.
- Concerns with covid-19 has been discussed with all the workers and they are comfortable with the work.

2. Hazard Identification
Describe what hazards exist in your lab/workspace; both research-related (chemicals, heavy machinery) and COVID-19-related (areas that require closer personal interaction, equipment/instruments that cannot maintain social distancing i.e. that require >1 person to operate)

- Innovate BC Hazards:
  - Lab 123 is the only space where Innovate BC work will take place. The lab contains two fume hood and bench top light machinery. There are the hazards of pinch points, hot surfaces from hot plates, 6 liter glass reactor which is used for chemical reaction (recycling foam to polyol product and all related accessories, condenser and mechanical mixer) equipment is fully secured to wall panel in the fume hood. The research uses filtration unit which is located in the adjacent fume hood. The filtration unit contains Buchner funnel with attached collecting glass under vacuum. The entire filtration unit is fully secured to the wall of fume hood. Chemicals that will be used are surfactants and solvent (toxic). These two chemicals are stored properly in the chemical cabinet according to UBC safety protocol. The use and operation of these equipment/chemicals will follow already existing standard procedures and safety protocols. See Appendix A for the procedure in place to remove the large amounts of un-needed chemicals previously used in this project when the lab researcher returns to work.

- ERMP Hazards:
  - In Lab 116 the pilot plant equipment of refiner and screening unit are complex machinery involving elevated pressures, rotation equipment, pinch points, load noise, potential dust, high temperatures. Operation of this equipment will follow pre-existing set procedures and will require the PPE of steal toes boots, coveralls, safety glasses, ear protection, face masks and hardhats. This equipment does require at least 2 people to operate, however the stations were
the workers need to be are 2m apart and space is large enough to allow for proper distancing when used.

- In 127, 127a and 123 contains bench top light machinery with few hazards. There are the hazards of pinch points (British disintegrators, sheet presses), rotational equipment which all have guards in place (centrifuge, disintegrators, PFI, Dynamic Sheet Former), hot surfaces (2 speed driers, hot plate, drum drier, convection oven), high voltages (Dynamic Sheet Former, drum drier), hydrologic oil (burst tester). Chemicals that will be used are several surfactants (toxic, irritant) and biocide (flammable, toxic, corrosive). The use and operation of these equipment/chemicals will follow already existing standard procedures and safety protocols.

- Covid-19 hazards: Only the pilot plant requires more than 1 user and while operating this machinery 2m distance between users can be maintained. No other machine or situation requires >1 user to operate. The various pieces of equipment are sufficiently spaced out where possible to allow for proper distancing between multiple lab users. When equipment is closer together than 2m, only 1 piece will be permitted use at a time. There multiple entry points to the labs and sufficient to allow for clear pathways to walk around other workers. Face masks, gloves, hand sanitizers and alcohol solution spraying bottles to sanitize surfaces have been placed near the entry points of lab 116/123/127 for worker use.

### 3. Employee (HQP, research staff, other) Input/Involvement

Detail how you have involved frontline workers (HQP and research staff) and Joint Occupational Health and Safety Committees (JOHSC) and/or Local Safety Teams (LST) in identifying risks and protocols as part of this plan.

- The LST has provide guidance and supervision to the workers in both projects. All safety procedure have been put in placed already and they are according to Pulp and Paper Centre building safety plan.

- The maximum building occupancy of 15 set by the LST has limited the number of workers allow in from this research group. Scheduling has been set to limit the number of workers to 2 under this PI.

- This group will follow the LST suggestion of removing unneeded stored items to free up extra space within the labs and to relocate some beach-top equipment to low traffic areas allow for greater distancing between workers. See Appendix A for the plan to remove several containers of chemicals and sample material.

Describe how you will publish your plan (online, hardcopy) and otherwise communicate workplace health measures to employees. Guidelines from SRS are available here: https://srs.ubc.ca/covid-19/health-safety-covid-19/working-safely/

- This safety plan will be reviewed by the LST, program head, PPC building director to determine if the content is in line with the new operational procedures of the Pulp and Paper Centre.

- The completed plan will be emailed to each worker, PPC LST, and print out copies will be kept near the entrance to Lab 123 to be available to all users of the building.

### Section #3 – Hazard Elimination or Physical Distancing
4. Scheduling
For those required or wanting to resume work at UBC, detail how you are rescheduling employees (e.g. shifted start/end times) in order to limit contact intensity at any given time at UBC.

- The 4 workers part of this workspace plan are:
  - Reanna Seifert
  - Daniela Vargas Figueroa
  - Reza Korehei
  - Michael Bilek

- Only 2 of the 4 personnel of this workspace plan will be scheduled to be on campus at the same time.
  - After new hire starts work
    - Reanna = 4 days per week Monday, Tuesday, Wednesday, Friday
    - Reza = 3 days per week Monday, Tuesday and Thursday
    - Michael Bilek= 3 days per week Wednesday, Thursday, Friday
  - This work schedule may change as needed, but will maintain the 2-person limit. There may be days in which Daniela will need to return to the lab, particularly to help with the transition with the new hire Michael Bilek. When this occurs, the workers will work out amongst themselves which person will not come to campus that day so that Daniela can take their time slot, maintaining the limit of 2 people.

- All workers present will use the log in sheet to keep a record of who is present for each day.
- Workers will use their assigned office space to eat their lunches. In cases where office space is shared, the worker can not enter the office if it already contains someone. This is the case for room 210 with Reza. The 2 users in this case are not scheduled to work on campus frequently and they have agreed to work out amongst themselves to have only 1 person in the office space at a time.
- All workers will be restricted to 8:30am to 4:30pm. No late or weekend work times are permitted. The 2 workers who are scheduled to work on any given day will work the same hours as to prevent ‘working alone’ situations.
- The workers will travel independently to and from work.
- Meeting and communications with the professors and industry partner will all be conducted on-line with no in person contact.

Discuss your working alone procedures and how they will be adapted for this safety plan. Also describe how you will track those entering/leaving work i.e. sign in/sign out process

- Hours outside of 8:30am to 4:30pm Monday to Friday are not permitted. During these work hours the shared lab space with other people in the shared lab and since the 2 workers will be on the same 8:30am to 4:30pm shift plus the presence of LST members within the building should prevent any ‘working alone’ situations. However, if a worker does find that they are working alone, they will implement existing PPC working alone procedures. They will inform their supervisor and their designated contact person via email or phone that they are working alone. If anyone else is in the building, they check-in with them at a safe distance. They will contact their designated contact person every 3 hours until they are finished working alone. If any problems arise they will contact campus security.
- A worker is only able to enter the lab space if the number of people within the lab space is below maximum occupancy.
- A sign in/out log book is placed at the door lab 123. Workers from this research group will sign in and out each work day.

5. Occupancy limits, floor space, and traffic flows
APSC recognizes that labs are dynamic environments and it may be challenging to adhere to physical distancing guidelines. Nonetheless, controls must be in place to keep personnel spaced at least 2m
apart at all times. Clear communication of this to employees, monitoring of implementation, in addition to physical controls (signage) are needed.

As such: Using floor plans and/or photographs of your lab/workspace:
1) Identify and list the rooms and **maximum occupancy** for each workspace/area;
2) Illustrate a 2 metre radius circle around stationary workspaces/benches/instruments and common areas or equivalent approach to social distancing; and
3) Illustrate one-way directional traffic flows

- Maximum room occupancy: 116 = 5 people, 127 = 3 people, 127a = 1 person, 123 = 2 people. These numbers are posted at the entrance of each lab space.
- Only 1 person will be allowed in the office space at a time.
- The worker will eat lunches alone in office, not in the lunch room, in order to socially distance.
- Upon the start of the work day the doorways to lab 123 as well as the door way between 123 and 127 will be kept open to eliminate the need to touch the door handle when entering or exiting.
- If maximum occupancy for the room has been reach no other entry into the area is permitted
- The workers are aware that they must leave at least 2m distancing between any pieces of equipment actively being used.
- Outside the lab, there is signage posted to set-up to show which directions to walk in the staircases, 2 metre spacing intervals on the floors and walls, signs to explain how walk in the hallways and maximum occupancies for other areas such as washrooms and lunch rooms.
- Below is are maps of the laboratory spaces; these maps are not to scale. In lab 116 the pilot plant equipment is located at one end of the room and is marked in blue. Red triangles mark out the stations where the 2 workers required to operate the pilot plant will be during operation. In lab 123,127 and 127a there are multiple pieces of equipment that may be used for the research work. The red circles mark the locations of the equipment that will be used in the ERMP research projects. Equipment that is within 2m of each other can not be used at the same time. Working on opposite sides of the tables in the centre of labs 123 will be used to keep workers seperated.

![Layout of pilot plant equipment in Lab 116](image-url)
Equipment/work areas for Reza’s Innovate BC project

Equipment in Lab 123 used for Reza’s Innovate BC project.
Equipment/work areas for ERMP project

- Below are images of the equipment that are planned to be operated by the laboratory workers:
Equipment in Lab 127. In order: Dynamic sheet former, freeness station with scale, high precision scale, speed driers and black microwave, scale, handsheet press and Buchner funnels and white microwave, British disintegrator, handsheet maker and blue handsheet press and PFI, Buchner funnel.

Equipment in lab 127a. Constant humidity and temperature room containing various paper testing equipment. Items to be used are, micrometer, brightness tester, balance, tear tester, tensile tester and burst tester.

Equipment in Lab 123. In order: Summerville (used for foam formation), FQA, British Disintegrator, disintegrator.
• Equipment will be permitted to be used if no other worker is within 2m. To overcome equipment that is too close together the following rules will be implemented to ensure 2m separation of workers at all times within the lab spaces. This is not an exhaustive list and each situation will have to be judged by the worker.
  o If the reactor is used in one fume hood, the other equipment in the adjacent fume hood can not be used by anyone else.
  o If the filtration unit in the fume hood is in use then the near by British disintegrator or Büchner funnels can not be used and FQA can not be run which is close to fume hood.
  o Only 2 people is permitted in 123 to use the lab testing equipment
  o If the FQA is in use then the near by British disintegrator can not be used and foam or vacuum forming can not be preformed on the north side of the room. Foam formation can be done on the south side of 123 and vacuum formation can be done in another lab, lab 127.
  o If the vacuum Büchner funnels in fume hood is being used then the adjacent sink can not be accessed
  o If the DSF and DSF press is in use then the freeness tester can not be used
  o If the handsheet maker/press is in use then the near by British disintegrator or Büchner funnels can not be used and PFI can not be run
  o If the speed driers are being used then the black microwave can not be accessed
  o If the vacuum Büchner funnels are being used then the white microwave can not be accessed
• Duplicates of several pieces of equipment are already set-up on opposite ends of the room which allows workers to spread out. There are 2 or mores sets of British disintegrators, Buchner funnels, balances and hands wash sink. Not all duplicates are shown in the pictures.

Section 4 – Engineering Controls
6. Cleaning and Hygiene
Detail the cleaning and hygiene regimen required to be completed by HQP, research staff and the PIs for common areas/surfaces (Custodial has limitations on cleaning frequency, etc.).

Outline specific cleaning processes and schedule for high-touch equipment, specialized/sensitive equipment or other unique circumstances to your lab/workspace. Detail how and what types of cleaning products and disposal options you will provide. If possible, include cleaning stations/infrastructure on your lab photos/plan.

• Each lab space has been equipped with alcohol solution spraying bottles, paper towels, hand soap located near the entrances of lab 127, 123 and 116. The workers/users of the lab spaces are responsible to cleaning common used equipment and surfaces.
• Each worker is responsible for wiping down the handles, buttons and touch surfaces of all used equipment after each use. This will include items such as door handles, speed dry handles, mixer handles/buttons, DSF controls, handsheet maker handle, handsheet press, sink handles, balances, the controls to the testing equipment in lab 127a as well any other used equipment.
• Items which are not shared, such as computers and note books will not be required to be wiped down.
• Items such as pens, markers, scissors, rulers, tape, safety glasses, lab coats, heat resistance gloves and calculators will be assigned to each individual worker (labeled with their names) and will not be commonly shared. All other common tools (pens, etc.) will be removed so that sharing can not occur.
• All used paper towels will be disposed of in garbage cans.
7. Equipment Removal/Sanitation
Detail your appropriate removal of unnecessary tools/equipment/access to areas and/or adequate sanitation for items that must be shared that may elevate risk of transmission, both research-related (i.e. instruments, tools) and general (i.e. coffee makers in break rooms)

- Common tools not assigned to a worker, listed above, will be removed to prevent common sharing.
- To create more usable space to allow for separation of workers, several bulky materials being stored in the lab were relocated to a storage area out of lab 123. See Appendix A for details on the removal of un-needed chemicals and sample material that will free up space in lab 123.
- One bench top mixer and the vacuum suction station has been relocated to the other side of working bench far from fume hood in the lab to reduce the equipment density in lab 123 and spread out the work areas.
- Workers will take lunch separately alone in their own office, 1 person to a room.
- No equipment in labs 127, 123 and 127a requires more than 1 person to operate. Operating the pilot plant in 116 does require more than 1 person, but the space and workstations are far enough apart to allow for proper distancing.
- The chemical reactor, filtration unit, use of fume hood and washing sink in the lab 123 will each be limited to 1 user per day or cleaned between different users.
- Machinery/equipment will be cleaned as described in the above section.

8. Safety Infrastructure Requests (Partitions, Plexiglass installation)
Describe any needs for safety infrastructure i.e. physical barriers, plexiglass installation required for your lab/workspace and if possible include them on your photos/room plan.

- No new safety infrastructure is requested

Section 5 – Administrative Controls

9. Communication & Training Strategy for Employees
Describe how you (the PI) have or will communicate the risk of exposure to COVID-19 in the workplace to your HQP/research staff/other employees and the safety controls in place to reduce such risk.

Detail how you will ensure that all employees successfully complete the Preventing COVID-19 Infection in the Workplace online training and orientation to your specific safety plan

- Each worker is aware to follow the rules and procedures set out by the LST, either through the notices and signage posted by the LST or directly from LST members.
- Each worker has reviewed (or will review in the case of the new hire) the material on the SRS website concerning covid-19 safe practices while on UBC campus.
- Each worker has been provided this workplace safety plan (or will be in the case of the new hire), has reviewed the information and is aware of the expectations in how they conduct their work while on campus.
- The 4 workers have completed and submitted their certificate to the LST for the Preventing Covid-19 infection in the workspace online training prior to entering the lab.
- If the workers have concerns or questions regarding the covid-19 work plan rules they have been instructed to contact the LST directly or by phone or email or to contact their supervisor via phone or email.
- Each worker is fully aware that if they have any flu-like symptoms must stay home.

10. Signage
Detail the type of signage you will utilize and how it will be placed (e.g. floor decals denoting one-way walkways and doors, ‘cleanliness state’ of equipment/instruments, hand-washing guidance). See WorksafeBC for signage guidelines and templates.

- In the lab spaces of 116, 127, 127a and 123 the LST has posted signage stating the maximum occupancy of the room and notices regarding preventing infection (wash hands, use hand sanitizer, disinfect surfaces, physically distance, avoid touching your face and the use of PPE) posted within each room in highly visible areas and on each doorway.
- In common building area the LST has posted signs stating the maximum occupancy of the room on each doorway, notices regarding preventing infection and notices to wash hands in frequented and high visibility areas. There are directions of travel in the staircases and spacing tape on the floor with directions of travel for areas in front of the elevator, lunch room and front lobby.

Few examples of displayed signage

11. Emergency Procedures & Reporting
PIs must ensure that all employees entering the lab should be aware of the Building Emergency Response Plan (BERP) and have access to it. If applicable, detail your strategy to amend your lab’s emergency response plan procedures during COVID-19. See the SRS guidelines for handling potential COVID-19 incidents here: [https://srs.ubc.ca/covid-19/health-safety-covid-19/reporting-covid-19-exposure/](https://srs.ubc.ca/covid-19/health-safety-covid-19/reporting-covid-19-exposure/)

- The 4 workers have reviewed SRS’s Building Evacuation Amendment Covid-19 and are familiar with the priority of evacuation over social distancing during an emergency and the need to social distance once at the predesignated safe location.
- The 3 workers are required to review and follow all documents from the LST, SRS or APSC dean office on covid-19.

12. Monitoring
Describe how you will monitor your workplace (supervisor, departmental safety representative, other) and update your plans as needed; detail how employees can raise safety concerns (e.g. via the JOHSC or Supervisor).

- The workspace will be directly monitored by the LST at the Pulp and Paper Centre, lead by George Soong. An LST member (Reanna Seifert) is regularly present within the requested lab spaces 5-4 days a week and the chair of the LST regular checks on the lab spaces throughout each day.
- If the LST or the workers finds this plan requires updating, they may call or email the request to the PI and a new plan will be drafted and disseminated to both workers, their supervisor, the LST, the Pulp and Paper Centre building director and printed to be placed in both lab 127, 123 and 116.
The workers may bring up immediate safety concerns with the LST present within the building directly or via email. The workers may also contact their supervisor via email or phone call. All of this contact information is known by each of the workers.

Section #6 – Personal Protective Equipment (PPE)

13. Personal Protective Equipment
UBC has a central process for purchasing PPE. Describe what PPE you will require for your lab.

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<th>#</th>
<th>Type of PPE</th>
<th>Activity and PPE Use Rationale</th>
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<tbody>
<tr>
<td>3</td>
<td>Safety glasses</td>
<td>Used when operating burst tester, handling chemicals, heating pulp mixtures – already have, assigned to individual workers</td>
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<tr>
<td>2</td>
<td>Heat resistant gloves</td>
<td>Used when heating pulp mixtures – already have, assigned to individual workers</td>
</tr>
<tr>
<td>3</td>
<td>Lab coats/coveralls</td>
<td>Used at all times within the laboratory – already have, assigned to individual workers with access to washing</td>
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<tr>
<td></td>
<td>Disposable gloves</td>
<td>Used when handling chemicals – currently have sufficient supply available</td>
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<td></td>
<td>Non-medical face masks</td>
<td>Since lab 123 and 127 are common shared labs, when more than 1 worker is present the workers will wear disposable non-medical face masks.</td>
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<tr>
<td>1</td>
<td>Face shield</td>
<td>Reza will wear a face shield assigned to him when conducting reactions</td>
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<tr>
<td></td>
<td>Steal toes boots</td>
<td>If pilot plant trials are required in lab 116, workers will wear their own steal toe boots</td>
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<tr>
<td></td>
<td>Ear plugs</td>
<td>Required if running trials in the pilot plant, already have sufficient supply of disposable ear plugs</td>
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<td>2</td>
<td>Hard hats</td>
<td>If pilot plant trials are required in lab 116, workers will wear their assigned hard hat.</td>
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Acknowledgement
I confirm that this Safety Plan has been shared with all workers (HQP, research personnel, etc.) who will be accessing this space both through email and will be made available as a shared document. Workers can either provide a signature or email confirmation that they have received, read and understood the contents of the plan.

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<thead>
<tr>
<th>Date</th>
<th>July 9, 2020</th>
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<tbody>
<tr>
<td>Name</td>
<td>Dr. Reza Korehe (PI: Dr James Olson)</td>
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<tr>
<td>Title</td>
<td>Research Associate</td>
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<td>Date</td>
<td>July 9, 2020</td>
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<tr>
<td>Name</td>
<td>Daniela Vargas Figueroa (Supervisor: James Olson)</td>
</tr>
<tr>
<td>Title</td>
<td>Laboratory Technician</td>
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<tr>
<td>Date</td>
<td>July 9, 2020</td>
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<tr>
<td>Name (Manager or Supervisor)</td>
<td>Reanna Seifert (Supervisor: James Olson)</td>
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<td>-------------------------------</td>
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| Date | July 9, 2020 |

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<thead>
<tr>
<th>Name (Manager or Supervisor)</th>
<th>James Olson</th>
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<tbody>
<tr>
<td>Title</td>
<td>Professor (Supervisor)</td>
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**Department/School Head/Director Approval**

Orlando J Rojas, Professor and Director BPI/PPC  
Sept 14, 2020

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<th>Name, Title</th>
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Signature

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Appendix A

Plan for Chemical Handling/storage and supplied bulky PU foam for Innovate BC project. Due to small space in lab 123 in pulp and paper center the large about of un-needed chemicals and sample foam materials will need to be downsized to open up space that will allow for proper distancing between workers. These series of points will be enacted when worker Reza Korehei returns to the lab and will be completes as soon as reasonably possible.

1. Innovare BC Industry partner (polymer research technology) has agreed to rent small storage space in Mitchell island for removing all large scale and bulky foam from PCC lab #123.

2. All chemical in pail sizes will be downsized to 2-3kg size in new glass bottle with propel label and will be kept in cabinet under fume hood.

3. All excess supplied bulky foam will be moved out from PPC lab 123 and no further PU foam will be obtained until all these supplied foam are consumed.

4. Only 2-3 kg of supplied bulky foam will be kept in the lab for each reaction, once a week.

5. All obtained recycled polyol (samples) will be kept in one wall cabinet and second cabinet will be free for other lab researcher (foam paper project and recycled coffee cups project).

6. All cup test foam in big plastic container will be moved to new storage in Mitchell island.

7. A complete and updated new chemical inventory list will be provided to safety manager in PPC.