ASCE INTERNATIONAL STUDENT GROUP
University of British Columbia

2022 Pacific Northwest Student Symposium

Environmental Competition Rules

Revised January 25th, 2022

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Overview

The Environmental Competition is an undergraduate water treatment project giving students in civil and environmental engineering or related programs a chance to gain experience with the research and design involved in water treatment, as well as an opportunity to develop professional skills such as technical writing and presenting. In the Environmental Competition, student chapter teams are given a real-world scenario to develop a filter concept that is designed to treat non-potable water to drinking water standards. The project is judged based on:

1. A technical report;
2. Filter design;
3. Costs, maintenance, and quality of discharge;
4. A digital poster; and
5. An oral presentation.

No model is necessary for this competition.

Teams may consist of any number of undergraduate students, and must submit technical papers and digital posters by **April 14th, 2022 at 11:59 pm PDT**. Students are encouraged to work with university faculty and local engineering professionals to create a practical and innovative method of addressing the scenario. Judges will share reviews of technical papers, digital posters, and assist with scoring on the day of the competition. **The day of the competition will take place in an online format; platform details will be released with Mailer IV.** Any questions should be sent via email to:pnw2022environmental@gmail.com
Responses will be sent by email and posted to the following page when appropriate: studentsymposium.asce.org/pacific-northwest/competitions

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Scenario

Located between Vancouver Island and the mainland of British Columbia, Cortes Island is home to a small remote community of just over 1,000 residents. The existing water supply is primarily sourced decentrally from local aquifers and wells. Unfortunately, the island is routinely under water stress due to the difficulty in transporting drinkable water to a remote region. Additionally, the lack of a centralized monitoring system on the small remote community means that there are often water quality concerns and boil water advisories issued as well.

The municipal government of Cortes Island has contracted your team to create a solution in the form of a rainwater harvesting and filtration system to address this challenge. The island is currently seeking a decentralized rainwater filtration system that will treat water to make it potable, with focus on low cost, construction materials and methods, and ease of maintenance. Due to the variability in rain, consider equalization (i.e. storage) of rainwater to maintain a surplus in supply of potable water. The filter design should consider addressing bacterial and algal growth resulting from water remaining stagnant for long periods of time. Typical rainwater constituents such as chlorine, potassium, and sodium should be considered.

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Technical Paper

Each team must submit a paper summarizing their design process, treatment principles incorporated, and a cost analysis of all materials used in table format. The technical paper shall convey the team's understanding of available water treatment concepts and processes in general, but with an emphasis on water filtration technology. The report should be broken up into the following sections:

1. Abstract;
2. Introduction;
3. Technical Discussion – Include detailed information that is specific to your water filtration system;
4. Construction materials, methods, tools, and cost (excluding labour) that would be used in the actual construction of the system;
5. Operations and maintenance procedures;
6. Quality of discharge and equalization of rainwater (i.e. storage);
7. References; and
8. Appendices, including table of theoretical costs, process flow diagram, cross-sectional diagram of the inside of filter, and any calculations.

All documents will be scored on creativity, technical merit, grammar & punctuation, technical writing skills, comprehensiveness, conciseness, clarity, length, presentation of diagrams, and adherence to all competition rules.

Technical papers shall be no longer than eight pages, excluding the cover page, references, appendices, and tables. The paper should be single spaced and written on letter-sized pages in 12 point Times New Roman font. The cover page should include: school & team name and the "trademarked" name for your water filtration system. Margins shall be 1 inch on all sides. If included, figures, graphs, and quotes showing material costs shall be included in the appendices. Technical papers shall be submitted as PDFs to pnw2022environmental@gmail.com by **April 14th, 2022 at 11:59 pm PDT**.

Digital Poster

Each team must submit a digital poster in lieu of a poster board. At a minimum, each digital poster must depict:

1. School and team name;
2. "Trademarked" name of your water filtration system;
3. Cost summary; and
4. Appropriate visual aids (e.g. diagrams, pictures, equations, props).

Ideally, the digital posters should be a concise version of the technical paper. Digital poster dimensions shall not exceed 24 inches by 36 inches and must be submitted as a PDF. Digital posters shall be submitted to pnw2022environmental@gmail.com by **April 14th, 2022 at 11:59 pm PDT**.

Oral Presentation

All teams will be asked to give a five-minute oral presentation about their filter design alongside a slide deck for visuals (e.g. PowerPoint). This will be followed by a five-minute Q&A session including technical questions intended to test students' understanding of water treatment principles.

Judging

The competition will be scored based on the following categories and total possible points:

1. Technical paper: 150 points
2. Oral presentation: 50 points
3. Exhibition poster: 50 points

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Technical Paper Scoring Rubric

At minimum, technical papers must include the following sections:

1. Abstract;
2. Introduction;
3. Technical Discussion;
4. Construction materials, methods, tools, and cost;
5. Operations and maintenance procedures;
6. Quality of discharge and equalization of rainwater;
7. References; and
8. Appendices.

Technical papers shall be in 12 point Times New Roman font, single spaced, and have at least 1 inch margins on all sides. Papers are limited to eight pages, excluding the cover page, references, appendices, and tables.

Category	Scoring Criteria	Total Points	Score
Formatting & Organization	Information is presented in a logical sequence and includes all required sections. All competition rules are followed.	10	
	Clarity and accuracy of language	10	
	Paper has appropriate references and appendices	10	
Content	Abstract	15	
	Introduction	10	
	Filter design (methodology and design process are clear and comprehensive)	35	
	Minimize costs and construction materials	15	
	Addresses operations, procedures and maintenance	15	
	Quality of discharge & equalization of rainwater	15	
	Diagrams, drawings, calculations	15	
	Total Score	**150**	

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Digital Poster Scoring Rubric

Each team, at a minimum, must include/address the following on their digital poster:

1. School & team name
2. "Trademarked" name for water filtration system
3. Cost Summary
4. Any other needed/appropriate visual aids

Category	Scoring Criteria	Total Points	Score
Formatting & Organization	Information is presented in a logical sequence and language is consistent.	10	
	Writing is concise, consistent, and appropriate amount of information is provided	5	
	Competition rules are followed	5	
Content	Technical content and material is appropriate for target audience	10	
	Material included on display is relevant and conveys water filter design effectively	10	
	Visual aids and graphics are informative and effective	5	
	Display is visually attractive and creative	5	
	Total Score	**50**	

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Oral Presentation Scoring Rubric

Category	Scoring Criteria	Total Points	Score
Organization & Delivery	Speaker maintains good eye contact with the camera and displays some animation (e.g. gestures, moving around, etc.)	5	
	Speaker is clear, audible and delivery is smooth	5	
	Ability to answer questions during a Q&A session	5	
	Length of presentation is within the allocated time limit	5	
	Information is well communicated in a logical sequence	5	
Content	Introduction engages the audience by establishing the defined problem and laying out the framework for the presentation	5	
	Presentation and material included is relevant to the overall message/purpose and is accurate	10	
	Appropriate amount of material is prepared, and examples or explanations are relevant to the main topic. Technical terms are well-defined and appropriate for the target audience	5	
	Evident conclusion that summarizes the presentation	5	
	Total Score	**50**	

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