

# The Environmental Challenge

...a competition for University students

The Environmental Challenge (EC) is proudly hosted by the Pacific Northwest International Section (PNWIS) of the Air & Waste Management Association ([www.pnwis.org](http://www.pnwis.org)).

## **THE PURPOSE**

The EC Program is a student team competition to prepare and present an optimal solution to a complex “true-to-life” environmental problem. The program presented is of current value, representative of the conference, and requires multi-disciplinary approaches for success. The EC Program is designed to promote formation of student teams with the broadest feasible range of environmental disciplines including, but not limited to, engineering, planning, policy, and economics. Teams must research the problem background as well as the technical, social, economic, and political aspects of the situation. Teams must stay apprised of ongoing events related to the problem by adjusting their solutions appropriately leading up to and during the conference.

The challenge seeks not only technical and scientific analyses, but solutions that are presented in conjunction with the development of appropriate regulatory approaches and resolution of political and community issues. We do not give you a lot of numbers to crunch. We are more interested to hear how you dissect the issues involved, interpret the problem, arrive at your conclusions, and communicate your thoughts. We want you to have fun!

The EC gives student teams an opportunity to develop solutions to a mock environmental problem and have the experience of presenting their solution to a panel of environmental professionals. This exercise gives all conference attendees a chance to participate and gets the professionals of tomorrow interacting with the professionals of today.

The goals of the EC are to:

- Involve students in the PNWIS Annual Conference of the Air & Waste Management Association.
- Be a premier networking event for students to connect with internship and job opportunities.
- Provide experience in solving complex environmental situations in a fun and supportive atmosphere.
- Give students opportunities to display their talents.

Although winning solutions to the challenge must have sound engineering and technical bases, the solution generally does not require a full engineering design presentation. Similarly, all problems pose economic and political issues that must be addressed. Solutions are expected to provide reasonable resolutions applying basic engineering and scientific knowledge to research scenarios and critical questions.

Once teams reach the conference, preparation will be the key to a successful competition; so be sure to obtain broad background knowledge of the EC topic! Role players in the EC problem will be identified and available for students to ask questions and consult for opinions. Role players are made up of conference attendees and professionals in the environmental field; they provide a key interaction point for the EC participants by giving feedback on their solutions, asking questions to prepare the students for the project presentations, and enhancing the networking experience at the PNWIS Annual Conference. The role players also are critically involved in a “Tweak” (added complication to the problem) that tests the students’ knowledge of the challenge topic.

## **THE CHALLENGE**

The year is 2019. The population of the province of British Columbia (BC) is booming at well over 800,000 people, and the mainland market is hot. Couve Island's economy has followed the trend. The Couve relies mostly on forestry, technology-based companies, provincial capital government, and tourism with droves of weekend visitors. There are thousands of jobs (mostly tourism-related) on the island, but there is no efficient way to get to or from the island except by ferry, boat, or plane (regular or float). In addition, with the possible movement of the provincial capital to the mainland is the commensurate loss of 20,000 direct or indirect jobs. Madam Grand-Penseur, the Premier of BC, is devising a plan. The island could join the booming economy if an easier and quicker way to get to and from the island was developed. With the momentum to move the capital, politicians on the mainland and on the Couve feel incredible pressure to help keep the island economy robust. The balance must be the creation of a different economy on the island, and increased tourism coupled with the goal of becoming the Silicon Shores (Rives de Silicium) will keep family-wage jobs. Having easy and quick connection to and from the mainland with its infrastructure is critical to the plan's success. The need to move both people and freight is incredibly important.

To this end, the government leadership along with business leaders have proposed an idea that has been discussed many times over the last 50 years: a bridge (The Link) from the mainland to Couve Island through Couve Passage and over Gallo and Nah-Cal islands. Prominent business leaders include Ms. Elan Musty whose technology company, Canesla (with its 8,000 employees), wishes to relocate and consolidate its operations on the beautiful island of Couve. The government and business leaders along with tourism, forestry, First Nations, and non-profit environmental groups have formed a committee (the Committee) and are working together to develop a mainland connectivity like no other in the world – it would be cheaper, technologically more advanced, and would reduce existing emissions in the area by 60%. This project is intended to help the BC government meet their Farris Accord commitment to lower emission rates and have less reliance on petroleum products. In addition, this project could be designed to lower risks to the critically endangered southern resident whales – a truly tremendous species who are at risk of ship strikes, but who may see The Link as a great wall along the southern border of their habitat.

Premier Grand-Penseur has claimed that improved access to the island will bolster the economy, create jobs, improve air quality, lower climate changing chemical use, and improve traffic.

*“Economic viability couples a sustainable, progressive, and environmentally sensitive approach that blends environmental justice with technology to keep the cost down and the needs at the forefront. We must get this right.”*

Ms. Musty, who is willing to invest substantial capital, technology, and community outreach in the project, states:

*“How exciting it will be to pioneer a coupling of proven engineering and knowhow with sophisticated and cutting edge technologies to lessen environmental impact and improve connectivity while maintaining autonomy.”*

Even so, the island community is split on their decision to become more connected to the mainland. They fear being overrun and displaced. Ms. Anita Chekmiself of the Phlatwird Society stated:

*“We thrive on our quaintness and the fact that we have few people and a lot of nature. We like being hard to get to. There are not the facilities or the power sources to sustain a large population here. We can't imagine the clogging of the roads, the air pollution, and the habitat impacts and pollution coming from the bridge. Everyone's leaky oil pan will flow right into Couve Passage!”*

Mr. Skip Tical with the Chamber of Commerce is torn between keeping the island ambiance, but also wants a sustainable economy and environment. He stated:

*“While I see the immense benefits from adding this so-called ‘Link’ to the main land, I also see that it may be difficult to make this environmentally friendly, sustainable, and allow us to keep the quaint style of the island alive. We are not wanting mega mansions to start popping up now that there will be easier access to this area... But! The bridge will help connect us in the Couve to the mainland adding some stability to our economy and less dependence on the ferry system with its limited access and impacts to whales. Though, we desperately need to reduce the greenhouse gases in the province, reduce our wastes and reliance on fossil fuels, and keep our environment and species in the area healthy.”*



Canesla’s proposed new office and research facility.



**Preliminary Routing of The Link. \*not to scale**

**Your Assignment**

You are being hired as the town's renowned team of unbiased environmental consultants to address the how, who, what and why of what needs to be done to complete The Link in a sustainable way. How can The Link be built when so many factors must be considered? Your proposed plan will be a proposal to the Committee that builds a world-class project while balancing environmental impacts, discharges to air and waste, social license, and economic interests. To be successful in your presentation, you must tactfully and eloquently articulate issues, knowns, unknowns, and recommendations for the completion of this effort. Remember, the committee must vote and approve any proposal -

there is no easy answer that will please everyone completely. You must do your best to build public support, articulate how to address the concerns of community groups, and ensure the project provides the most tangible environmental, economic, and social benefits.

At a minimum, you should keep in mind and address these questions in your submission to the Committee:

1. Develop a project description that outlines the necessity and importance of the project to the province of BC, Couve Island, and the mainland.
2. Suggest a design that facilitates economic development while balancing environmental/social concerns.
3. Develop a list of possible issues/challenges and mitigation measures associated with The Link.
4. Develop and demonstrate approaches to reducing/avoiding air pollution.
5. Develop and demonstrate approaches to reducing/avoiding aquatic discharges.
6. Develop and demonstrate approaches to attaining public support/social license for the project
7. Develop and demonstrate approaches to managing/avoiding impacts to habitat and endangered species.

### **The Expectation**

Numbers are not what is most important – logic train, process, conceptualizations, and creativity are the most important considerations for your proposal and presentation. As you may notice, and as we have intended, you have not been given all the information you might require or desire to solve this problem. Such is life.

We encourage you to make assumptions, but you must be ready to defend them and pass the “straight-face” test. Keep in mind this is a competition, and every team may make assumptions with the given information differently. Remember the fundamental principle for success on any project is to KISS (keep it simple stupid). You will be expected to present your thoughts in a public forum: eloquently, succinctly, and persuasively.

A note on professionalism: you will notice that a bit of humor is woven into this problem. PNWIS traditionally keeps the EC light so students have fun. We encourage you to do the same. That being said, choose wisely the humor you wish to employ.

The judges are a collective of professionals ranging from those who are young and early in their career, to those who are heads of companies and presidents of national organizations. You are under the microscope by an eclectic group of individuals, so keep it tasteful and be respectful.

### **The Proposal**

Submit your team’s proposal by **6 p.m. on Monday, October 29th, 2018**, via e-mail to [Melody.Kieneker@erm.com](mailto:Melody.Kieneker@erm.com).

The proposal should outline the team members by name and assumed project role (e.g “David Bowie” is going to be engineer and will address waste issues, “Carl Sagan” is going to be your air quality expert and thermodynamics enthusiast, “Frederick Law Olmsted” is going to be your landscape architect, and “Kermit” is going to be your urban planner and sustainability champion). The proposal should illustrate the technologies and strategies your team has identified, along with a clear approach of how you will implement them.

### **The Tweak**

No matter how much you do and know, unexpected events and expectations can and do occur in real life. To this end, expect some late-breaking information that might alter your approach and require your plan to evolve, perhaps substantially. The problem and “the Tweak” will require that you find and talk to experts and attend various presentations during the conference for answers and important information. Details on where you need to be to interact with key players will be provided on the first day of the conference. Remember, those who are most successful in the



“real world” are those that can identify what resources they have and use them. You are at a professional conference; what resources do you have?

When you submit your proposal, you will receive the Tweak via email prior to the conference. The sooner you submit the proposal the sooner you get the Tweak, but the earliest you will receive the Tweak is the day you submit your proposals.

Good luck and have fun!

## **PROTOCOL**

Pay close attention to the protocol and follow the rules to a tee. This is a game of points. The proposals need to follow the guidelines established in the protocols listed below. Also, there are some changes that have been made this year. So, again, **READ THE BELOW PROTOCOLS!**

### **The Presentation**

Your team will need to demonstrate your understanding of the issues that you addressed in your proposal. You must include not only your key elements from your proposal, but also demonstrate adaptive management in dealing with the Tweak. Sustainable approaches for these and other site issues are of great interest to most stakeholders. The winning team presentation will be strong in logic, clarity, application, and creativity.

Each team will present their solution on **Thursday** afternoon, November 8th, as part of the conference. When we know how many schools will be presenting, we will develop a schedule, but plan on presentations beginning at 12:00 p.m. and concluding at the end of conference Day 2. PNWIS will have a projector and a laptop (with Microsoft Power Point). Please bring a USB flash drive so we can transfer your presentation to the laptop prior to the presentation. Plan for no more than 15 minutes of presentation followed by 5 minutes of questions and answers. You will be timed, and the 15-minute rule is strictly enforced.

Each team must send an e-mail to Melody Kieneker stating your intent to compete ([Melody.Kieneker@erm.com](mailto:Melody.Kieneker@erm.com)). This e-mail will serve as your enrollment in the EC competition. The email addresses that enrolled the teams will also be used to deliver information of any changes prior to the competition. If you have questions, submit them to Melody Kieneker. Answers to the questions will be sent out to all teams.

Each team member must register for the PNIWS Annual Conference in addition to stating their intent to compete. See the conference website for registration links. (<http://www.pnwis.org/annualconference/>).

### **EC Competition Preparation**

Once the problem is posted, students should immediately start to form teams and identify/recruit representatives from appropriate disciplines as needed to address the problem holistically. Just as corporations and other organizations pull together teams from their staff to most effectively address any given project, so too should each student team. Student teams may not contain more than 5 members and are generally comprised of 3 to 5 individuals.

### **Eligibility**

The EC competition is open to all students who are registered for the PNWIS Annual Conference and have not been out of school for more than 1 full year. The competition will be a combined event for graduate and undergraduate students competing equally.

### **Expectations for proposed problem solutions**

Solid technical analysis, logic train, process, conceptualizations, and creativity are all critically important to the proposal and presentation composition. Clear and concise presentation of your thoughts in a public forum is paramount to success.

### **Written Proposal Guidelines**

Each team must submit a written proposal prior to the PNWIS Annual Conference on Monday, October 29th, 2018, by 6 p.m. addressing the problem. The written proposal should provide an outline of the approach that your team is going to take, the issues that you will be discussing, and shall not exceed 3 pages (not including Title Page and up to 3 diagrams, tables, or figures). Please do not forget to include your school, student names, and roles of each team member.

### **Proposal formatting guidelines include the following:**

- 10 Pt Font (Times New Roman or equivalent)
- 1.5 Line Spacing
- 1 Inch Margins
- Divide your proposal into ordered sections
- References in text must be fully cited at the end of the proposal.
  - Example:
    - Reference in text – (Kuhn, 1962)
    - Full reference at end – T. Kuhn. The Structure of Scientific Revolutions (University of Chicago Press, 1962), pp. 27-42

### **Penalties for breaches in protocol:**

- Late Submittal (5 Points Per Day)
- Failure to Register with Melody Kieneker prior to proposal submittal (5 Points)
- Deviating From Formatting Guidelines (3 Points Per Infraction, up to 15 Points)
- Failure to Interview all Roll Players (Up to 10 Points Per Roll Player, at Roll Players Discretion)

### **Role Players**

This year we will be addressing the role players in a different forum. During the conference, you still will be required to speak with role players involved with the problem. Instead of you seeking out these role players throughout the conference, there will be a 15-minute session per team to address questions. Of course, you can still seek the role players out during the conference for follow up discussions, but the only required speaking time will be during the session. Each session will be closed to only the role players and individual teams – other teams will not be able to sit in on other's question time. These role players will be project proponent(s), regulators, politicians, activists and other expected or

unexpected individuals critical to creating a solution to the problem. Role players will offer insight and clarify any additional questions each team may have in relation to the problem. Please use professionalism during all business meetings, technical sessions, and plenary sessions; have fun while remembering your environment. While these role players are critical, so are the technical sessions and exhibitors that are related to the problem.

An orientation meeting for the EC participants will be held on Wednesday, November 7th, 2018, (exact time and location will be identified in the conference program). Please anticipate being at the conference location by midday November 7th. Role players in the problem will be identified during the Wednesday meeting and individual team sessions will be held for you to discuss your proposals with the role players.

### **Competition Finale - The Presentation**

For the final presentation, teams must demonstrate their understanding of the issues in the written proposal and address the Tweak. A multi-faceted approach is essential. The solution must address technical, social, and environmental issues.

The winning team presentation will be strong in approach, logic, clarity, application, and creativity.

To further allow for students to attend the Gala event and have more time to interact and join other technical sessions, each of the teams will present their problem solution on **Thursday**, November 8<sup>th</sup>, from approximately noon to 5 p.m. during the conference EC technical session program that day. A computer and projector will be provided for the presentation (with Microsoft PowerPoint). Please bring your presentation on a USB flash drive to be transferred to the computer. Plan for a 15-minute presentation followed by 5 minutes of questions and answers. The 15-minute presentation limit is strictly enforced. Please practice accordingly. Since this year's presentations are one day earlier, please plan accordingly.

Winners will be announced at the Honors and Awards Luncheon on Friday, November 9th, 2018.

Good luck and have fun!



## **EC Timeline**

End-July, 2018: EC Problem Posted

October 29, 2018: EC Proposal due by 6 pm

October 30 - 6, 2018 : Tweak Sent to Teams after Proposal Submitted

November 7 - 9, 2018: PNWIS Annual Conference

November 7, 2018: EC Orientation (Location & Time TBD) & Interactions with EC Role Players. Anticipate midday timeframe.

November 8, 2018: EC Presentations (12:00 PM)

November 9, 2018: Honors and Awards Luncheon (12:00 PM)

If scheduling dates, times, or locations change all participants will be notified as soon as possible. Please reach out with any questions or concerns.

### **Submit Proposals and questions to:**

Melody Kienecker

[Melody.Kienecker@erm.com](mailto:Melody.Kienecker@erm.com)