

## **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

Welcome to the small town of Idahipsy! Last year, previous consultants started to delve into the town's issues surrounding decreased rainwater and their over consumption of water. Alas, climate change has continued to cause disruptions to everyday life and threatens the future stability of the town and power grid of Idaho. Historically this region had silver and gold mining operations, one named Fara-way Mine, dating back to the 1880's located upriver and east of the city in the hills. In addition, this small-medium sized community has schools, markets, shopping malls, a few lakeside resorts bolstering their water sports, beaches, nature, and three nearby (within 100 miles) hydropower facilities. The nearest is just downriver and west of the city, Whatsa Dam, a 500 megawatt (MW) facility that creates the lake that Idahipsy sits on, Lake Washhashore. See Figure 1. for a generalized layout of the region.

Global climate change has shifted the regional climate to have much drier, hotter summers and winters with rain and snowfall amounts drastically reduced when compared to just 10 years ago. Extreme temperatures the past few years have been melting the regions snowpack sooner each sequential year and has reduced the overall glacial snowpack.

With decreased snowpack the river levels have been dwindling. By the end of each summer the lake is low, and it is taking longer to regain its water capacity. In addition to lessened rain and snowfall, river draw down remains high from the town residents and farmers, and existing water rights are stretched thin. With the water levels dropping local hydropower facilities are unable to meet regional demand and are generating less power. With any luck by the end of the summer the power plant is only generating 50% of its maximum capacity. This is limiting the local areas electricity prices, as well as the inhibiting the ability of the power facility to sell excess power to the surrounding states.

In addition to the energy issues of the region, a local government cleanup agency entity has identified a potential issue. Sandy Batum of Idaho DEQ was taking an afternoon stroll by eastern end of Lake Washhashore when they noticed a large swath of land sloughing into the lake. The decreased water levels have caused the (previously covered) lake's alluvium fan sediments to dry out, destabilize, and migrate further into the lakebed waters. Sandy Batum hypothesizes these sediments may have elevated metals concentrations above IDEQ cleanup thresholds, perhaps among other constituents, leading to questions about public safety, access to the water for recreational purposes and potential harm to aquatic species.

The townsfolk are complaining about energy prices, the lakebed and surrounding waters may be contaminated, the power plant is concerned about their business's sustainability (green eco sustainability, as well as the sustainability of their business for the long term), and the Governor is pushing for solutions. Key directives the Governor wants to focus on, but not necessarily *only* focus on, includes stabilization of the hydropower facilities that are currently in-use for reduced water flows, plausible lakebed contamination and repercussions of this finding, re-evaluation of the water consumption of the region or reuse the little that they have, ensure the economic stability of the regions electrical grid and bolster renewable energy for the state, specifically the Whatsa Dam.

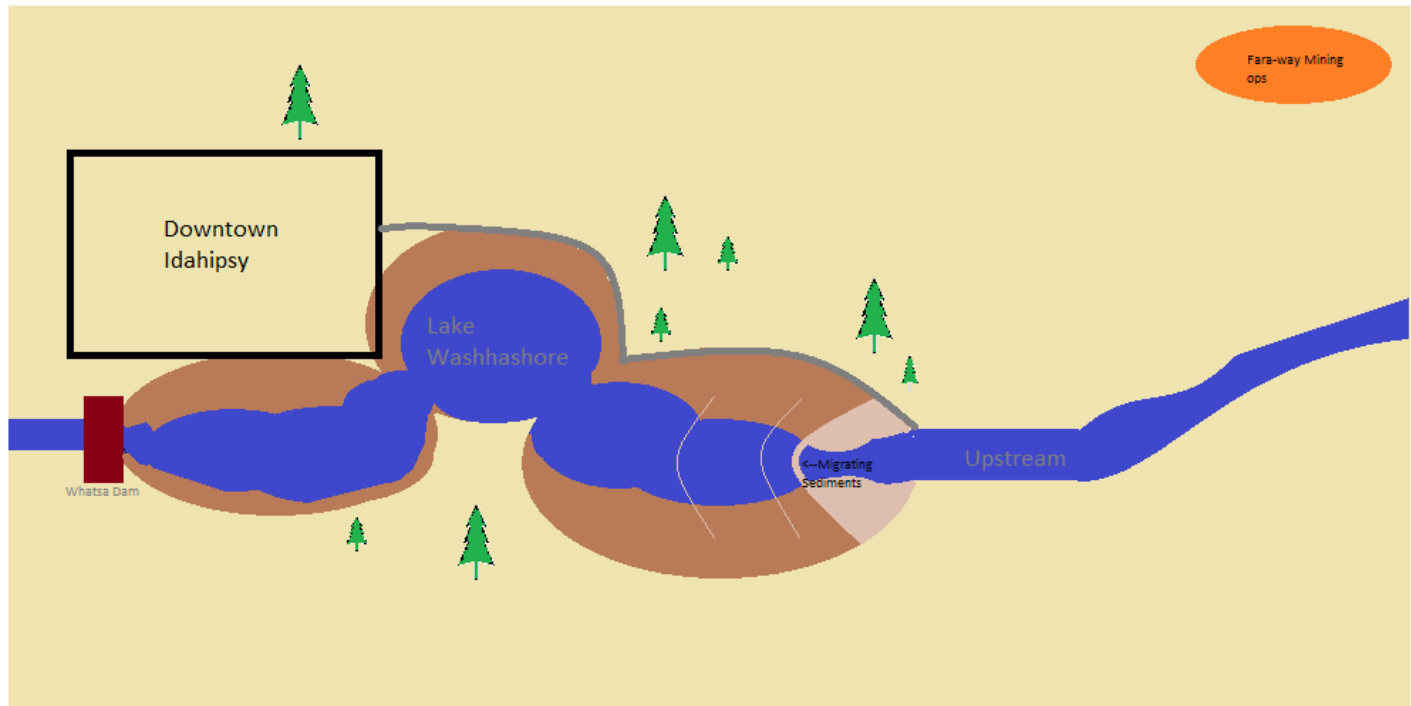
The Governor is not handing out buckets of cash without guarantees. So, they are needing to brainstorm ways they can improve their town's climate stability, while remaining financially solvent, or close to it.

To help the town figure out these issues, you, the renowned environmental consultant has been hired to develop a plan of action. There are many potential solutions for bolstering the community's ability to continue to generate electricity and combat the effects of climate change, but they need help figuring out what to focus on, and how to do it. You have been tasked with developing a plan and various remedies that *at least* include the following:

1. Identify a plausible solution(s) to resolve the hydro facilities growing flow issues
2. Identify technical pathways to evaluate water rights in the region and sharing of available water resources
3. Who/where/when/why/what needs to happen with potential contamination in the lakebed sediments? Is this a public safety concern?
4. Detail your plan for what you are going to do, explain any potential benefits and challenges that come along with these options.

5. Develop potential costs and financing for your technical remedies.

\*Not to scale\* Figure 1. Idahipsy and the surrounding region.



### **Your Assignment**

You are being hired as the town's renowned team of unbiased environmental consultants to address the who, what, where, when, how, and why of what needs to be done to help the community prepare for an uncertain future. Your proposed plan needs to balance plausible climate change impacts, environmental impacts and waste issues, 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.

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.

### **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 st...). 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 **5 p.m. PST on TUESDAY OCTOBER 4<sup>TH</sup>, 2022** via e-mail to **MKieneker@FarallonConsulting.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. **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.

**This year, all sessions will be held in-person. If your team would like to participate virtually, please reach out ASAP to coordinate with Melody.** During the conference week of October 11 – October 13 each team will meet with each role players to discuss their proposals and incorporate their feedback. During the first meeting we will also discuss any important meeting information, or general Q/A for the challenge. Final presentations will be held October 12<sup>th</sup> during the conference. If you have any direct concerns, please reach out to Melody Kieneker. For presentations, 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. If your presentation is shorter than 15 minutes, the extra time may be used for further questions.

### **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.

Each team must send an e-mail to Melody Kieneker stating your intent to compete ([MKieneker@FarallonConsulting.com](mailto:MKieneker@FarallonConsulting.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 PNWIS Annual Conference in addition to stating their intent to compete. See the conference website for registration links. (<http://www.pnwis.org/annualconference/> <https://pnwis.org/annual-conference-2022/>).

### **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 Virtual sessionsconference on Tuesday October 4 2022, by 5 p.m. PST 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 the challenge is in person. If you would like to participate virtually, please reach out to Melody ASAP. During the first day of the conference each team will meet with each role players to discuss their proposals and incorporate their feedback. Role player sessions will be approximately 20-30 minutes per Role Player per team to address questions.

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.

#### **Competition Information and Final 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.

Winners will be announced at the Awards Luncheon on the last day of the Conference.

Good luck and have fun!

#### **EC Timeline**

End-August 2022: EC Problem Posted

October 4: EC Proposal due by 5 pm PST

October 4: Tweak Sent to Teams after Proposal Submitted

October 11 - 13: PNWIS Conference

October 12: Final Presentations with Role Players and Judges

October 13 Awards Luncheon and Announcement of Winners

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 Kieneker

[MKieneker@FarallonConsulting.com](mailto:MKieneker@FarallonConsulting.com)