Hotel accommodations shall be defined as one (1) hotel room, the night of March 17th (Tuesday), at the Borgata Casino Hotel in Atlantic City, NJ. Rooms shall be used for a maximum of three (3) team members and their chaperone(s). All participants will be required to sign a release form in order to attend and/or participate. Any participants under the age of eighteen (18) will be required have a chaperone in attendance with them at all times. Team members attending will be asked to present their posters during lunch on March 18th, 2020. Students will be encouraged to participate in AWWA NJ Section conference events during their stay.

Do You Have What It Takes To Build A Water Filter From Scratch?

Find out at the 6th annual

AWWA Student Filter Building Competition

With A New Competition Scenario!

For High School and College Students
Great Resume-Builder, Learning/Networking Opportunity

1st Prize $300
2nd Prize $200
3rd Prize $150

Hotel accommodations will be provided for the winning teams to participate in the AWWA NJ Section Annual Conference Student Research Poster Competition.

Registration Deadline: February 5, 2020
Competition Date: Saturday, February 15, 2020 (Snow Date: February 16)
Location: New Jersey American Water, Canal Road Water Treatment Plant
Register at https://www.njawwa.org/event/FilterComp

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IMPORTANT NOTES

- The competition hosts are under a strict schedule; therefore, no late registrants will be allowed on site. Please plan your travels accordingly, taking into consideration weather, time and traffic. Should you need assistance on the day of the competition, please call Evan Lutz (973) 294-5232.
- All participants under the age of 18 must be accompanied by a chaperone.
- Teams shall consist of a maximum 4 members.
- Participants are expected to dress business casual at the event.

SCHEDULE

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 - 9:30 am</td>
<td>Registration &amp; Team Setup</td>
</tr>
<tr>
<td>9:30 - 9:40 am</td>
<td>Opening Remarks &amp; Safety Procedures</td>
</tr>
<tr>
<td>9:40 - 10:00 am</td>
<td>Plant Tour Part 1</td>
</tr>
<tr>
<td>10:00 am - 12:00 pm</td>
<td>Competition Judging &amp; Plant Tours</td>
</tr>
<tr>
<td>12:00 - 1:00 pm</td>
<td>Lunch + Meet &amp; Greet with Water Industry Professionals</td>
</tr>
<tr>
<td>12:30 – 1:00 pm</td>
<td>Special Guest Speaker Presentation</td>
</tr>
<tr>
<td>1:00 – 1:30 pm</td>
<td>Additional Competition Judging &amp; Plant Tours (if needed)</td>
</tr>
<tr>
<td>1:30 - 2:00 pm</td>
<td>Award Presentations</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Wrap Up</td>
</tr>
</tbody>
</table>

DIRECTIONS

Enter the following information into GPS: 701 Randolph Road, Somerset, NJ 08873

When you turn off of Randolph Road, continue straight down the New Jersey American Water driveway for approximately 1/4 mile to the front of the treatment plant building.
RELEASE AND WAIVER OF LIABILITY FORM

I, the undersigned, do hereby acknowledge and agree that I intend to participate in the AWWA NJ Section Student Filter Building Competition at New Jersey American Water Company's Canal Road Water Treatment Plant, located in Somerset, NJ on Saturday, February 15, 2019 (snow date February 16, 2020) from 9:00 AM – 2:00 PM.

I also understand that New Jersey American Water Company and the American Water Works Association New Jersey Section are not responsible for any expense and liability incurred as a result of my participation in this event, including any medical expenses due to sickness or injury incurred as a result.

I understand that I am not permitted to use any photographic or videographic equipment during this event.

By signing below, I express my understanding and intent to enter into this Release and Waiver of Liability willingly and voluntarily.

Please print clearly. Please submit during registration.

Name: ______________________________________________________________________________________

Complete address: __________________________________________________________________________
____________________________________________________________________________________________

Email: ____________________________ Phone: ____________________________

Signature: __________________________ Date: ____________________________

Parent/guardian signature if participant is under 18 years old:

__________________________________________________________________________________________

Date: ____________________________
COMPETITION SCENARIO

Overnight, while you and your fellow students were studying, an unexplainable phenomenon occurred causing all humans over the age of 22 to vanish. Being such smart people, you realize that all clean drinking water will quickly deplete as no water treatment facilities are in operation anymore. After a team meeting, you decide to go to the local stores only to find they have already been ransacked. All disposable water bottles and premade water filtration devices have been taken already.

To avoid dehydration of your team (4 person maximum) you must build a water filtration device to safely drink from nearby sources of standing water. You decide that a 5-gallon bucket is your best filter body, but now you need to decide what will be inside your filter. Think of locally sourced items that may be easy to acquire. During your design and testing process you’re aware of the following; you will be carrying your filter to different locations, you will eventually be replacing your filters contents, and you will want to filter water in a reasonable amount of time. You will need to describe your filter properties to other people that you meet in order to gain their trust in your model.

TECHNICAL GUIDELINES

1. RAW WATER
   a. The raw water used in the competition will be finished (clean) water contaminated with soil from the area around the water treatment plant. Generally there will be a mix of sands, silts and clays with a particle size no greater than 0.25”.

2. FLOW: DESIRED RANGE: > 0.5 GPM
   a. The flow rate of a filter is a measure of efficiency when compared to removal rates. Flow rate is typically a function of the granular properties of the filter media, and available area.
   b. Filters shall be flushed with finished (clean) water prior to judging. After initial flushing, filter must be completely drained prior to the addition of raw water.
   c. Flow rate shall be measured by volume of water discharged per minute. When up to ten (10) gallons of raw water is added into filter, team members shall be responsible for adding raw water to filter. Raw water will be provided on site. Flow score shall be measured after water quality data has been collected from filter effluent. Project manager shall elect when to begin judging. Score is calculated by effluent flow rate in GPM.

3. WEIGHT: DESIRED RANGE: 35LB-65LB
   a. Weight is directly correlated to the density of filter media, therefore an effective design will balance weight limitations against flow rates and solids removal.
   b. Filter weight shall be measured after filters are flushed.

4. TURBIDITY REMOVAL: DESIRED RESULT: <10 NTU
   a. Turbidity is the cloudiness or haziness of a fluid caused by large numbers of individual particles that are generally invisible to the naked eye, similar to smoke in air. Turbidity.
   b. Turbidity removal shall be measured prior to flow rate, and shall be scored as the difference between influent water turbidity and effluent water turbidity.
   c. No pre-fabricated or mechanical (electronically operated) filtration systems will be permitted. Designs can employ standard filtration methods, but must be pre-constructed by team members, prior to event date.
   d. Consider testing your filter with a turbidity meter (talk to your school’s faculty)

5. MATERIAL ACCESSIBILITY AND COST: DESIRED RANGE: 20% - 100% ACCESSIBLE LOCALLY
   a. Teams shall prepare a short calculation to be presented on poster board explaining filter material accessibility, measured as a percentage of materials which can be accessed in the local area.
   b. Consider creative solutions for manufactured materials.
   c. Cost of filter should be cumulative retail cost of all materials good, whether they were purchased or reused.

6. POSTER PRESENTATION AND RESEARCH:
   a. Keep in mind competition scenario for design of filter and presentation.
   b. Presenters are expected to be able to discuss project research and details clearly, showing a full understanding of the design. Presenters are expected to use visual aids such as charts, pictures, and/or AutoCad details to explain their design criteria, research parameters, material(s) used as filter media, cost analysis, and any other pertinent information. Posters shall measure no larger than 24” x 36”, and be mounted to poster board.
   c. A maximum of two team members shall be required for poster presentation.

* Design ranges provided are approximate values, and will be calibrated based on actual competition results.
FIGURE

- Handle
- Optional diffuser plate
- Standard 5 gallon bucket, as manufactured by The Home Depot, Loews, or equal
- Clearly display team logo on bucket
- Bucket shall not have any penetrations except for instruments and drain
- Each filter shall have one (1) ¾" Ø faucet type drain, as manufactured by Bluewave Water Bottle, Inc. or equal

Filter media, performance test data and methods used to determine choice and layering of media shall be presented on poster under drain.