

# 2018 WERC Environmental Design Contest

# TEAM MANUAL



All About Discovery!  
Engineering New Mexico Resource Network  
[enr.nmsu.edu/enmrn](http://enr.nmsu.edu/enmrn)

## Team Manual

*This document is intended for use by team advisors and students to assist in planning for and competing in the WERC Environmental Design Contest. The information below is not “required” but merely an attempt to assist the team to be competitive in this event.*

### **Regarding the team composition:**

1. A good team should consist of members interested in different disciplines: Chemical, Environmental, Mechanical, Art (for your poster, handouts, and esthetics), Tech Writing (for your paper), Safety, etc. This is an excellent opportunity to learn to work as a team.
2. Experience is helpful for the Faculty Advisor. Keeping the same advisor from year to year is an advantage for the team.
3. Select a team leader who has leadership capability as well as knowledge in laboratory procedures, safety aspects, and chemical clean-up.
4. This is a time intensive project especially the closer you get to the actual date.
5. Check your calendar for conflicts with the contest date.

### **Regarding financial sponsor:**

1. Fund raising is a challenge. Good support may come from businesses in the community who were declared “Friends of the Environment”.
2. Financial support from your department or school is always a possibility.
3. Follow-up financial support with recognition from the team.

### **Regarding the research:**

1. Print off everything on the web site concerning the task, team building, and the competition. Everyone needs to read it.
2. Have the team leader check the web site weekly or assign one person to do it (expect changes). Check web site from more than one direction...there may be errors that don't get picked up.
3. Make check lists of expectations listed in judging criteria and use them. Make a checklist for equipment when you travel.
4. Stay organized; have one person who is best able to do it keep the research information in a logical way using manila file folders or a three-ring binder.
5. Throw nothing away, if it even touches on the project. Some of the most creative solutions came from minor points mentioned in papers not directly concerning the task.
6. If you have a mentor with expertise in the necessary area; contact the mentor early and often; he or she may be a source of research papers, and you need as much primary research as possible.
7. Don't be afraid to go to the top to find information or resources; top people can help, and they don't look down on you as a young person, but are excited about your interest if you show you are informed and enthusiastic
8. Learn to deal with change. Expect it. Don't sweat the small stuff, or things that are done and can't be changed.

### **Regarding the paper:**

1. Use professional papers to learn how to organize yours. The judges are accustomed to reading scientific writing. Leave the flowery, undocumented writing behind you and get down to business.
2. Cite sources as you go; you may not be able to find the source again, even if you think you can.
3. Use your auditors' comments; they make a real difference. The more expert, the better for the quality of your paper.
4. Be sure and have the paper rough-finished at least three weeks before the paper due date, in time for two weeks in the auditor's hands and a minimum another week of work by the team to incorporate changes. You might have to do more research after the auditors respond.
5. Have an English teacher or professional writer review your paper, and listen to their recommendations on sentence structure.
6. Make the paper flow.
7. Don't forget a time line for the actual industrial installation, scaled up from the bench scale.
8. Work carefully on the figures for the full-scale product; it doesn't necessarily just multiply from your bench scale. Remember things like permit fees, construction costs, architect fees, and other things, depending on the task. A professional in the field, such as your city manager, may be able to help you there.
9. Cost-effectiveness is a key issue; collect numbers as you research, and keep cost in mind as you refine your solution.
10. Don't forget to send the paper in a PDF format. If you don't have Acrobat – you can use their web site to put several documents in PDF for free. Have only one document that you send to WERC and make sure it includes all aspects including the audits.

### **Regarding the oral presentations:**

1. Have your oral presentation ready two weeks before contest, minimum!
2. Present before a professional, such as other faculty. Listen to their advice, and then correct things.
3. Follow through on finding out the answers to judges' questions at the oral presentation, and give answers at the poster presentation.
4. Show results and costs, and respond to their focus.
5. If you use something in the oral or in the poster presentation you didn't in the paper, cite it. Know your sources well enough to be able to tell where information came from.
6. Stop frequently in the poster and oral presentation to let the judges process the information; pauses are good things, not bad ones.
7. Be prepared to answer questions about applications of the process; how to market it, who would use it ("the target audience"). If you were employed by someone in industry, this would be of critical interest.
8. Try to relax before the presentation.
9. If you don't remember something, pause.
10. If you don't know the answer, don't try to make one up or fake it...say you don't know. You can follow it up with, "I don't know, but think it might be ... If this occurs on the oral presentation, get on the phone to your mentor or another expert and find the answer that night, to be ready for the poster presentation.
11. Be prepared to cite your sources.

### **For the Bench Scale setup:**

1. Be very careful with safety concerns, and make your setup stable and safe. You will be inspected by NMSU Safety Office as well as the WERC Contest Safety team.
2. Test your setup if possible to check for leaks and stability.
3. Buy and bring your own goggles, rubber gloves, aprons or lab coats, etc. WERC will have some available but your own will probably look better.
4. Rinse the sample bottle before you put the treated water back in it, so there is no contaminated sample left behind to skew your results.
5. If you are shipping your equipment, pack it very carefully. Often items are broken if packed in a large container and not well padded.

### **Regarding the bench scale:**

1. Run the bench scale before you come, and analyze your results.
2. Check on the availability of a test kit you can order, so you are independent of other labs to test your results.
3. Think like a scientist; if your first hypothesis does not prove correct, think, research, discuss solutions with your advisor, make another one and try again! And again. And again.
4. Be persistent; there is a solution that will work, but it may take time.
5. “Keep It Simple” if possible, because there are fewer things to go wrong.
6. At the contest, you will be able to set-up your bench-scale on Sunday but it should not be operational until after the Safety Meeting on Sunday evening.
7. You will receive your samples (if your task requires sample) on Monday. At that time, you may begin your process.
8. Your samples will be picked up **no later than Tuesday afternoon**. Check your schedule for the exact time.

### **Regarding the poster presentation:**

1. Learn from each group of judges at the poster presentation, and incorporate it into the next presentation.
2. Be flexible; don't let one poster presentation that doesn't go well throw you.
3. Don't memorize the poster presentation; perhaps the first intro, but not all.
4. Practice your presentation to every passerby who comes by the poster; you need the practice, and they may ask new questions you may need to consider.
5. Tell them something new that was not in the formal oral presentation.

### **Regarding travel:**

1. Keep track of expenses for budgeting reasons for the next year.
2. Take your computer, printer, and other technology with you. You may need them for another copy of the paper, to correct the board, or do other tasks you didn't have time for before arriving. It's cheaper than Kinko's!
3. A trailer or extra vehicle is good to rent to carry equipment and luggage,
4. Put equipment and the bench scale items in a secure place.
5. If you are not bringing your equipment with you ship by FedEx or UPS and track it yourself! Lost shipments are not uncommon.
6. Check out cool spots to see in New Mexico: White Sands, Very Large Array, Sun Spot side trips enrich the experience and help bond the team for future work together.
7. The El Paso Airport is an hour's drive away from Las Cruces.

**Contest in general:**

1. Dress to impress; look, act, and dress as professionals.
2. Have your team set-up a realistic time-line and follow it.
3. When on off-time and spare time - network. Talk to people, whether they are students or judges or local college students. If they are professionals, get their cards.
4. Don't just sell your process, sell yourselves.
5. Bring extra copies of your paper with contact information, in case they want to recruit you or get additional information.
6. Bring your resumes. If you are not graduating, there may be internships available. If you are graduating, there may be a job available.
7. Bring your research to the contest; all of it may be useful and if it is well organized, you will be able to answer questions from the judges you did not anticipate or put in the paper.
8. Make personal card for yourselves, with contact information. This is in addition to any you may make for the oral presentation. Brochures for the oral and poster presentations are nice touches.
9. Your team may benefit from tracking the hours spent on different areas of concern: research, testing, writing, etc. After tracking their time, they would know how valuable their work really is.

**After the competition, write down what you have learned and use it for the next year's contest!**