The Environmental Challenge Int'l

…a student team competition

THE PROBLEM

The Purpose

The Environmental Challenge gives teams the opportunity to develop solutions to a mock environmental problem and have the experience of presenting their solution to a panel of environmental professionals. We do not give you a lot of numbers to crunch. We are more interested to hear about the issues involved, how you interpreted the problem, how you got to your conclusions, and how well you can communicate your thoughts. We want you to have fun! This exercise gives us all a chance to participate and gets the professionals of tomorrow to interact with the professionals of today.

The Problem

With the economies of China and India expanding at a rapid pace even during the current slowdown, the global demand for energy is at an all time high. Based on current technology, hydrocarbons, specifically oil and gas, are still the most cost-effective source of energy for both industry and consumers. At present, demand is outpacing the global supply of oil. The future ability of oil-producing countries to meet this demand is highly dependent on the physical and political stability of the regions. Recent troubles in Iran, Iraq, Algeria, Nigeria and Venezuela has put strain on the supply of oil and has put the future stability of these regions into question.

The Alberta oil sands are made up of large tar-like deposits in Northern Alberta, Canada and are among the world's largest hydrocarbon resources, second only to those of Saudi Arabia. The political stability of the region and the proximity to the United States has made them an attractive alternative to conventional oil sources.

Companies working in the oil sands industry extract bitumen from ore using the Clark hot water process. This process creates both usable products (i.e. bitumen) and waste streams. The waste streams are deposited and stored in tailings ponds for future treatment in the reclamation process.

As the oil sands become a growing source of oil supply, they are receiving increased public scrutiny. As a result, there is growing concern in the NGO community, media and public about the environmental impacts of the oil sands industry.

In Alberta, there are a number of provincial regulations aimed at environmental protection. These regulations cover all aspects of industrial development including construction, operation and reclamation.

Crown Oil is one of the largest companies operating in the Alberta oil sands industry. The company was founded in 1951 and has its headquarters in Calgary. As an early entrant to this industry, Crown Oil has built its identity around its oil sands activities and its involvement in local communities across Alberta. It is a highly regarded organization and many in the province feel proud that it was established in their backyard.

The Chief Environmental Officer (CEO) of Crown Oil is Sidney Auerbach, who has expressed the importance of oil sands:

> "The global demand for energy continues to grow and renewable alternatives are not yet able to meet this demand. For this reason the world will be relying on carbon-based energy sources for many more years. Many of the current energy resources are in politically unfavorable environments. Alberta has the benefit of being able to provide reliable energy sources without this political tension. Furthermore, the oil sands are an economic engine for Canada and a major employer of people from across the country. One in six Albertans are directly or indirectly employed in the energy sector. That being said, we need to develop this resource with a balanced approach that considers the economic benefits, social implications and minimizes all environmental impacts."

Recently, the renowned and highly regarded magazine *International Landscapes* ran a story on the Alberta oil sands which featured a number of vivid and damning photos of the landscape surrounding oil sands extraction areas. A spirited activist representing international advocacy agency Enviro Harmony named Russell McMaster spoke out in opposition of development of the oil sands:

> "Now everyone can see the tremendous environmental destruction of the development of tar sands: tailing ponds, greenhouse gas emissions, water pollution, air pollution, and disruption of the boreal forest. This is why it is "dirty oil". For companies to be fundamentally changing the entire ecosystem of our land is unacceptable; *International Landscapes* has shown that. Couple that with the human rights concerns of the Aboriginal populations in the area the government needs to put an end to this now."

However, the general public seems to be split, siding with either Enviro Harmony or the oil sands industry. Kris Booth, an employee of Crown Oil, takes exception to those who are against the development of the oil sands. She says:

> "The oil sands mean a lot to me, I support my family with my job, and I know that many of my friends and their families are here in part

> because of the oil industry too. The reality is there is a huge demand for the oil and those people who have a problem with the oil sands are part of the problem just as we are. The people of Alberta have prospered with oil; whether or not they are directly employed by an oil sands company. We have a history of environmental responsibility. We live here too"

In light of the debate, Crown Oil has decided to revisit the approval application that it is currently seeking from Alberta Environment to develop a proposed new oil sands mine called the Pearl Mine, worth an estimated $2 billion.

In revisiting the request for approval the company has decided that a new approach is needed in addressing concerns that may be raised by its stakeholders and to meet the company's desire to seek out more sustainable solutions. The company also feels it needs to do a better job communicating about the challenges and opportunities associated with oil sands development.

As mentioned, current technology to extract bitumen from ore using the hot water process creates both a usable product (i.e. bitumen) and waste streams. In the extraction process, the minerals and unusable organic compounds that are intrinsic in the ore are distributed into the bitumen and tailings streams (in a soluble form). The waste streams are then deposited and stored into tailings ponds where they will be further treated in the reclamation process.

An ideal process would not extract these minerals and unusable organics into the bitumen or soluble portion of the tailings stream. Instead it would maintain the minerals and unusable organic compounds in their natural inert state to be returned to the mine as part of reclamation.

Crown Oil is currently soliciting "Expressions of Interest (EOI)" from external consulting teams who feel they would be able to produce a final report that could address the technical, social and communications challenges it faces. It would like this done before the project is resubmitted to the Alberta government for approval. The EOI should include:

a) A brief statement (i.e. press release) in reaction to the *International Landscapes* article supporting the development of the Pearl Mine and minimal environmental degradation that will occur at the site. This should be written from an environmental perspective.

b) A proposal of identifying an alternative solution(s) (technologies and/or processes) to the current approach of recovering bitumen while not creating a waste stream requiring further treatment that are economically viable and significantly reduced environmental impacts.

c) A plan on how to communicate the proposed solution to its stakeholders and community that also puts into context the challenges and opportunities of the development, including energy security, economic and social benefits of the project. This proposal will also address the environmental and social concerns from stakeholder groups that may come up during the approval process.

While Auerbach is not looking for a detailed budget at this time, it is important to understand that there are budget limitations and spending less is always better. Every member of your team wants to do well on this project, as securing the potential Crown Oil contract to produce the final report for Crown Oil would be a significant win for your team.

The Expectation

Numbers are not what is most important – logic train, process, conceptualizations, and creativity are most important to the proposal and presentation composition. Logic of your vision and clarity in your presentation are critical. Remember you can come up with assumptions, but they will need to pass the "straight-face" test. Furthermore, you will have to present your thoughts in a public forum where you also will be subjected to a Question and Answer session. This is what environmental professionals face in the real world!

The expectations for the team Proposals and Presentation are presented below. The **Proposal** expectations include identifying each team member by name and the role they will have in the presentation (i.e., "Nilly Willy" is going to be engineer and will address waste issues, "Jim Bean" is going to be your air expert, "Bill de Mup" is going to be our 'architect', "Slee Zee" is going to be your public relations, etc., - you put in the disciplines that you think you need). In the proposal you should have an outline of the approach that you are going to take and the issues that you will be discussing.

For the **Presentation,** your team will need to demonstrate your understanding of the issues that you addressed in your proposal. Sustainable approaches for these and other site issues are of great interest to the owners. The winning team presentation will be strong in approach, logic, clarity, application, and creativity.

Finally, there is a strict five page limit for the proposal submittal and a maximum time of 15 minutes for the presentation.

For further guidance, please refer to the **PROTOCOL** document on the A&WMA's ACE website.

The Tweak

No matter how much you do and know, in real life unexpected events and expectations can and do occur. To this end, expect (when you pick up your registration package) some late breaking information that might alter your

approach and/or require your plan to evolve. The problem and the tweak will require that you find and talk to “experts” (i.e., environmental professionals that have agreed to participate) and attend technical sessions, during the conference, for answers and important information.