



PERF Newsletter

June 2007

Environmental, Health, & Safety Solutions for the Petroleum Industry

74th PERF Meeting Advanced Biotechnology 12 - 13 June, Belfast, UK.

The 2007 summer PERF meeting will be held on June 12 - 13 at the QUESTOR Centre, Queen's University Belfast, UK. The theme of this meeting will be "Advanced Biotechnology" with focus on both the upstream and downstream applications of biotechnology. Prior to the technical meetings, the PERF Board will meet on June 11.



On June 12 the technical sessions will start at 9:00 a.m. Shuttle bus transfer will be provided between the Hilton Hotel and the University (agenda details departure times). Catering arrangements have been made at Registration, mid-morning, lunch and mid-afternoon. A tour of the QUESTOR Centre is planned for late afternoon and in the evening there will be a Reception and Dinner in the Great Hall.

On June 13 the technical presentations will begin at 9:00 a.m. and will include breakout sessions for the upstream/downstream discussion groups. Shuttle bus transfer will be provided between the Hilton Hotel and the University (agenda details departure times) and catering arrangements have been made on arrival, mid-morning and lunch.

Hotel: Each person is responsible for making his or her own hotel reservation. A block of rooms (please quote Block Booking QUE100607) has been reserved at the Hilton Hotel until May 10 after which, in line with hotel policy, any rooms which have not been reserved under this block booking will be released. Anyone making a reservation against this block booking and subsequently wishing to cancel must do so by May 10 or they will be charged for the room if it is not subsequently re-booked. Credit Card details will be requested from those making a reservation. Rooms are guaranteed to be available by 3.00 p.m. on the day of arrival and must be vacated by noon on the day of departure. All rooms are single, en suite with breakfast at a cost of 120 pds sterling per person per night which is a special rate. Please make your reservation by May 10 to avail of this rate.

The Hilton Hotel
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E-mail: carolyn.haskins@hilton.com

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The Queen's University of Belfast, Lanyon building

Web Site Hilton Hotel, Belfast:

http://www1.hilton.com/en_US/hi/hotel/BFSHITW-Hilton-Belfast-hotel/index.do or <http://hilton.co.uk/>

Maps: Google: Hilton Hotel, Belfast - Get Directions leads to a very good map!! In addition there are various maps on the Queen's University website:

<http://www.qub.ac.uk/home/TheUniversity/Location/Maps/> which may be of help. The Main Campus Map shows

No. 1 - Lanyon Building and No. 2 - the Peter Foggatt Centre, which, between them, house all venues for the meeting; the QUESTOR Centre is located at No. 38 - David Keir Building. The Hilton Hotel is c. 3 miles from George Best Belfast City Airport and the taxi cost would be c. £7; it is c. 20 miles from Belfast International Airport and the taxi cost would be c. £20. The University is c. 2 miles from the Hilton Hotel and taxi costs between the University and the airports would be similar to those quoted for the Hilton Hotel.

There is a frequent bus service between Belfast International Airport and the city of Belfast. Details of this service are at web address: <http://www.belfastairport.com/en/content.asp?area=2&id=183>

Please use the registration form found on the PERF website to register by May 31.



Local Conditions of the Belfast area




Belfast (from the Irish: *Béal Feirste* meaning "The sandy ford at the mouth of the river), in the United Kingdom, is the capital of Northern Ireland. It is the largest city in Northern Ireland and the province of Ulster, and the second-largest city on the island of Ireland. Like much of the country, Belfast has a temperate climate with significant rainfall. Average daily high temperatures in June are 18 °C (64 °F) and lows averaging 9 °C (48 °F). You can expect 68mm (2.7 inches) of rain during the month of June.

Queen's University Belfast is a university in Belfast, Northern Ireland and a member of the Russell Group (the UK's top 20 research universities). Queen's University of Belfast was founded in 1845, and lends its name to the Queen's Quarter of the city.




New Projects

New project proposals

2006-07 Arsenic Remediation Sharing Cooperative: Update

The PERF Arsenic Sharing Project is now underway: the objective of the project is to share knowledge regarding arsenic remediation and assessment options in soils and groundwater. BP is the sponsoring company and organized the first face to face meeting on March 15 in Houston that was held at the Shell research facility. Presentations were made by all the companies who expressed an interest in participating in the project. The subject matter ranged from detailed descriptions of sites where arsenic was present in soils and groundwater around hydrocarbon spill sites to current remediation projects at former fertilizer sites.

Currently Exhibit B's (proposed work to be done) have been received from the following companies: BP, Chevron, ConocoPhillips, Total, and Shell. Also, API has submitted a proposed Exhibit B and will be participating in the project. At the meeting in Houston we also discussed issues that need to be in the participation agreement which is currently being drafted by BP attorneys and will be ready for distribution to the participating companies soon. Contact person for the project is: Todd Ririe at todd.ririe@bp.com.



2006-4 Evaluation of Novel Monitoring Techniques proposed by Chevron

Chevron is proposing a PERF study to evaluate new and novel air quality monitoring techniques. New monitoring technologies that are inexpensive and have very low detection limits have become available or are in the process of being developed. One potential monitoring technique is the personal badge technology. These technologies are being used by various government and non-governmental organizations to assess emissions and community exposure from oil and gas production, storage, refining, and marketing facilities. In some cases these organizations are conducting inaccurate analysis and presenting incorrect results. The purpose of the study would be to evaluate one or more of the novel personal badge technologies in an industrial complex for a two to four week period. It would be desirable to conduct the field test in an area that has an existing monitoring network or an industrial complex that has ambient air quality monitors for comparison purposes. Also, if a company has a location with some of the newer monitoring technology, the resulting monitoring results and analysis can be shared for inclusion and participation in this project.

For more information or to join the project, please contact Chris Rabideau at CRabideau@chevron.com or 713-954-6981.



2006-03 - WWTP - Fate & Effects of Pollutants - proposed by TOTAL

This project consists of a "mass balance" evaluation to understand how and where pollutants transfers from liquid to gaseous and solid phases occur throughout the unit operations of the Waste Water Treatment Plant system.

It will lead to:

- The environmental impact assessment of each process (gas and solid phases)
- Optimization to reduce the environmental impact of each process

Some points have to be defined:

- The processes to consider (settler, flotation unit, biological process...)
- The chemicals to study (we propose 3 compounds : a BTEX, a HAP and a metal)

For more information please contact Nicolas Lesage (nicolas.lesage@total.com).

2006-02 VOC IR Camera Sharing Cooperative - proposed by TOTAL and BP

Total and BP have proposed a project to share knowledge regarding infrared cameras for VOC leak detection. The project type would be shared with a projected cost \$50,000 of shared value research.

Lessons learned from field trials with different IR camera technologies can be shared among participants. This would help in selecting the right camera for the right purpose, by extending the field of investigation and the type of camera tested.

There are several IR camera vendors that are commercially available: Flir, PAT, GasOptics, Bertin, etc. Some cameras are portable and some are fixed mounted. Some technologies can analyze for specific hydrocarbons and quantify emissions. Each participating member company conducts a field trial with a different technology, then that field test data can be leveraged and shared among participants. This project would include different products, different sites, and different possible application. For more information contact: Marie-France Benassy (marie-france.benassy@total.com) or DaveFashimpaur (dave.fashimpaur@bp.com).



2006-01 Whole Effluent Assessment (WEA) proposed by TOTAL

The main goal of this project is to evaluate the relevance of ecological risk assessment with respect to WEA method in comparison with *in-situ* impact assessment. Does WEA predict a real ecosystem risk for the receiving waters? If WEA is a good indicator of ecosystem risk, it could be used to access difficult river or estuary segments, in place of *in-situ* impact assessments; or to predict ecosystem future wastewater effluent. The two alternatives to conduct this project to be discussed are:

- "real world" river analysis, or
- the use of mesocosms called
- "Rivieres pilotes" (less variability).

For more information contact Anne Basseres (anne.basseres@total.com).



Study Recommended by PERF Members Serves as Basis for EPA Permit Determination

The U.S. Department of Energy (DOE) periodically seeks recommendations from PERF members on the types of environmental research projects that will yield good benefits for the oil and gas industry.



In the spring of 2004, PERF members recommended that DOE provide \$100K of funds to Argonne to conduct a study evaluating the characteristics of produced water discharged from offshore oil and gas platforms in the near-shore Gulf of Mexico. For the past few decades, a zone of low oxygen (the hypoxic zone) has formed off the coast of Louisiana and Texas each summer. The scientific community had postulated that the pollutants carried by the Mississippi and Atchafalaya Rivers were the primary contributor to formation of the hypoxic zone.

In 2004, EPA issued a discharge permit for offshore platforms requiring them to collect produced water data to help in quantifying the industry's contribution to the hypoxic zone.

DOE provided funding to allow Argonne to design and coordinate the sampling study, which included interaction with EPA, DOE, MMS, and several industry groups, to facilitate data collection, transportation, and analysis under rigorous quality assurance/quality control practices. The samples were collected and analyzed during the first few months of 2005, and the results were compiled and evaluated during that spring. The data showed that even though concentrations of oxygen demanding materials were high in produced water discharges, the mass loading from the entire platform community represented just a fraction of a percent of the loadings coming from the Mississippi and Atchafalaya Rivers.

The final report was submitted to EPA in August 2005. EPA hired three independent expert water quality modelers to use the Argonne data as inputs to their models. In May 2006, the modelers submitted their final report. Their findings were consistent with the earlier Argonne findings. They found that produced water discharges would make an insignificant incremental contribution to dissolved oxygen levels in the hypoxic. PERF members recommended that DOE provide an additional \$50K of funds to Argonne to present the findings of its study and to provide support to EPA's permitting efforts if needed.

EPA released the next draft discharge permit for offshore platforms on December 21, 2006. In that draft, EPA indicated:

"EPA has also recently completed a study of the effects of produced water discharges on the hypoxia in the northern Gulf of Mexico [the Argonne study] and found that these discharges do not have a significant impact."

"The Region finds that discharges proposed to be authorized by the reissued general permit will not cause unreasonable degradation of the marine environment."

"EPA finds that the potential impact on the hypoxia from produced water discharges is insignificant. Therefore, no additional permit requirements are proposed at this time".

The Argonne produced water characterization study provided the baseline data for these findings. Had the study been funded by industry instead of by DOE, the results may not have been considered by EPA in the same light. Had EPA's determination not been so clear-cut, the latest permit could have placed significant restrictions on biochemical oxygen demand (BOD) or other parameters that cannot be readily treated at platforms given the space and weight constraints. This could have forced offshore operators to

pipe produced water back to shore or reinject it. Both of these options are quite costly (probably at least many hundreds of million dollars), and could have caused some production to be shut in. In any case, DOE's commitment of \$150K of PERF member recommended funding to Argonne paid tremendous dividends in avoided costs.

For more information contact John Veil at 202-488-2450 or jveil@anl.gov

Oxygen Injection Group Forming

There is understandable interest in oxygen injection systems owing to the abundant evidence of in situ aerobic biodegradation of hazardous and sometimes recalcitrant gasoline constituents. Significant remediation cost reductions are possible by stimulating indigenous microorganisms to degrade contaminants of concern by adding oxygen. There appears to be a lack of significant independent scientific data available on the relative efficiency of the various available oxygen distribution technologies, however.

Field demonstration evaluations of commercially available oxygen distribution technologies, operating at their highest setting, were performed in side by side test cells. Each test cell measured 50 ft by 50 ft and was instrumented with 60 to 80 monitoring wells at 1.5 to 6 ft spacing. These wells were sampled at 4 to 6 week intervals in order to evaluate the oxygen distribution to a medium-sand aquifer. After 1 month of operation, the measured oxygen distributions for each technology were quite different. The distributions measured at 2 and 3 months showed essentially stable dissolved oxygen signatures - in some cases drastically different from data made available from commercial sources.

To further work in this arena, a workgroup is being formed to assess the most commonly used distribution technologies in the soil stratigraphies of greatest interest. A kick-off conference call is planned for the week of May 14, 2007. Any interested parties are directed to contact Cristin Bruce at Shell Global Solutions (cristin.bruce@shell.com).

PERF Spring Meeting



The spring 2007 PERF meeting was held March 8-9 in Fresno, Texas at

the Champion Technologies Research and Development Center. The theme of this meeting was "Chemical Treatment of Water" with technical presentations focused on both the upstream and downstream applications. The PERF board met on March 7 preceding the general meeting.

The technical sessions ranged from petroleum emulsion formation, dynamics and demulsifiers, to new technology for desalter optimization and optical scale detection.

The meeting attendees had a very informative tour of the Champion Technology Research Center.

The second day of presentations included talks on refinery heavy metals reduction and a web-based informational tool on produced water. This was followed by the upstream and downstream discussion group breakout sessions. The PERF business meeting followed and there were project proposals for evaluation of oxygen distribution (2007-01), diversion boom ice-basin test (2007-02), and new technology options for VOC control (2007-03).



Environmental, Health, & Safety
Solutions for the Petroleum Industry

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Teamwork	Together we achieve the extraordinary!

The Petroleum Environmental Research Forum (PERF)* is a research and development joint venture, formed to provide a stimulus to and forum for the collection, exchange, and analysis of research information relating to the development of technology for health, environment & safety, waste reduction and system security in the petroleum industry. PERF is a non-profit organization of Members which are corporations engaged in the petroleum industry that recognize the importance of a clean, healthy environment and are committed to support cooperative research and development. PERF does not itself participate in research projects but provides a forum for Members to collect, exchange, and analyze research information relating to practical and theoretical science and technology concerning the petroleum industry, and a mechanism to establish joint research projects in that field.

*The name Petroleum Environmental Research Forum and its acronym PERF are registered service marks.



We're on the web:
<http://www.perf.org/>

PERF External Group Liaisons

PERF encourages external groups such as trade associations, national laboratories, and research institutes to join as Liaison members. PERF values the partnerships that we have with these external groups and they frequently join PERF projects and contribute valuable research.

Liaison members appoint Representatives that have the right to attend and participate in meetings of PERF and its committees, but they do not have the right to vote or to serve as an officer of PERF. Liaisons are not required to pay the fee paid by Members.

- American Petroleum Institute (API)
- Department of Energy (USDOE)
- Gas Technology Institute (GTI)
- Lawrence Berkeley National Laboratory (LBNL)
- Water Environmental Research Foundation (WERF)
- Argonne National Laboratory (ANL)
- Electronic Power Research Institute (EPRI)
- International Association of Oil and Gas Producers (OGP)
- Oak Ridge National Laboratory (ORNL)
- University of Manchester Institute of Science and Technology (UMIST)

Member Companies & Representatives

- | | |
|---------------------|--------------------|
| Amerada Hess Co. | Gerry Bresnick |
| Aramco Services Co. | Robert Finley |
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| Chevron | Roland B. Borey |
| ConocoPhillips | Sung-I Johnson |
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| Petro-Canada | David McIntyre |
| Repsol YPF | Marta García Ariza |
| Shell | Karen G. Haynes |
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| Total | Pierre Scherrer |

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- | | |
|--|------------------|
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