



# **Perf Newsletter**

**81st Meeting of the Petroleum Environmental Research Forum (PERF)**

## **Evolving Environmental Regulations and Opportunities for Green Technologies** **April 8-9, 2010**





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**Petroleum Environmental Research Forum**

[WWW.PERF.ORG](http://WWW.PERF.ORG)



# Evolving Environmental Regulations and Opportunities for Green Technologies

The Petroleum Environmental Research Forum (PERF) Meeting will be hosted at the BP International Centre for Business and Technology, Sunbury, UK, near London. The meeting dates are April 8 and 9. The theme for the meeting is "Evolving International Environmental Regulations and Technology Opportunities - "Green Technologies". Day 1 of the meeting will have a split agenda with separate sessions for E&P Drilling Wastes topics, and for R&M emissions reduction issues, including IPPC. Day 2 will cover environmental impact assessments of drilling operations and the PERF business meeting. An agenda with specific topics and speakers can be found on the [PERF website](#).

There is no charge for the conference, but you must register to attend. The registration form

found on the PERF website must be returned by

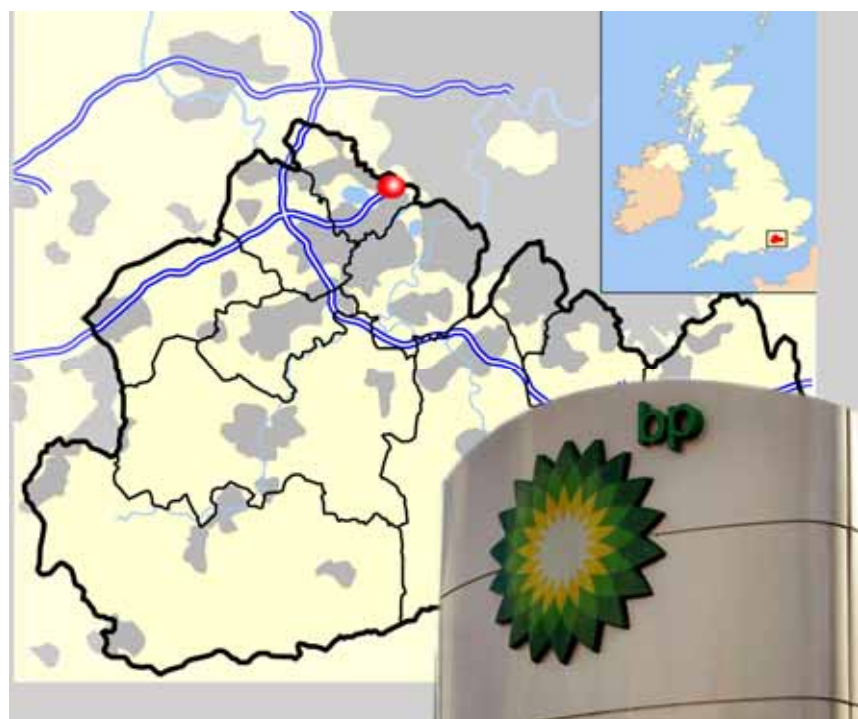
April 1st, 2010 to

Del Percival at

[Del.Percival@uk.bp.com](mailto:Del.Percival@uk.bp.com)

or

call +44 (0)1932 763493 if you have specific questions.





# Hotel:

Each person is responsible for making his or her own hotel reservations.

You can get special BP rate for the PERF attendee at the Richmond Hill, Richmond-upon-Thames. Please contact the hotel directly and ask them about the "PERF Meeting" block of rooms. The rate is £122 (includes bed and breakfast and all VATs). *The special block rate will expire on March 24<sup>th</sup>.* Information on the hotel, including maps and directions, may be obtained through the hotel website:

<http://www.foliohotels.com/richmondhill/>.

Richmond Hill, Richmond-upon-Thames, Surrey, TW10 6RW

Tel: +44 (0)20 8940 2247; Fax: +44 (0)20 8940 5424

## Travel options:

Airports: LHR – London Heathrow Airport approximately 30 miles from BP Sunbury.  
LGW - Gatwick Airport approximately 40miles from BP Sunbury

Transportation: Towne car service is available from the airports to the hotels. Please contact any of the vendors suggested below for service.  
Aptus Worldwide +44 (0)1895 432112

## Travel options:

By car

From Central London:

M4 - A312 - A316 (to Sunbury Cross) - A308 (towards Staines)

A4 - A30 - A312 - A316 (to Sunbury Cross) - A308 (towards Staines)

A316 (to Sunbury Cross) - A308 (towards Staines)

A3 - A309 - A308 (to Sunbury Cross) - A308 (towards Staines)

From M25

M25 - M3 - A308 (towards Staines)

From A308

Half a mile from Sunbury Cross, turn right at the traffic lights into Cadbury Road. At next junction turn left into Chertsey Road and follow signs to the visitors' parking.

## Visitors' Parking

Visitor parking on site is limited and you should seek advice from your host before you arrive on site.

If you are unable to do so and need further assistance please phone the Concierge on 01932 764940.

Useful websites

[www.streetmap.co.uk](http://www.streetmap.co.uk) (road maps)

[www.theaa.com](http://www.theaa.com) (route planner)

## By train

The ICBT is located within easy access of Feltham station (30 minutes from Waterloo).

There is a free BP shuttle bus between Feltham train station and ICBT. The shuttle bus stops on

site are located beside building F and behind building A. Sunbury station is a short taxi ride away or a 25 minute walk.

## By tube

The nearest tube station to Sunbury is Hatton Cross on the Piccadilly line.

Alight the tube and catch either the 555/6/7 or a taxi to the ICBT.

The estimated journey time is 30 minutes by bus from Heathrow.

Route 285

Buses run every 10 minutes between Heathrow airport and Feltham station.

They serve the central bus station at Heathrow and terminate at T3.

The estimated journey time is 30 minutes.

Route 555/556/557

Buses run to/from T1 and T4 at Heathrow and leave every 20 minutes.

They stop at the end of Feltham Hill Road. Alight from the bus, turn left into Chertsey Road and you will see the ICBT directly ahead of you.

## Sunbury Weather in April

Avg. high	55°f	13°c
Avg. low	42°f	6°c
Avg. rain	1.8 in.	47 mm





# Pre-Proposals

## **Sheening Associated with Contaminated Sediments:**

This proposed PERF project will increase our understanding of the processes controlling sheening in sediments and investigate improved remedies to mitigate or control sheening in sediments. Specific issues that may be addressed in this project include: analytical tools to distinguish petroleum sheens from biological sheens; TPH threshold for sheening; sediment and/or oil properties that may influence sheening; sediment process(es) which cause sheen; in situ or capping approaches to control sheening in sediments. Scheduling of a kick-off call to further scope out the project is underway. To join the call, please contact Chevron's Will Gala at [WGala@chevron.com](mailto:WGala@chevron.com).

## **Treatment Wetlands:**

This proposed PERF project will involve a series of pilot wetland tests based on PERF member wetland interests and potential wetland applications. Specific issues that may be addressed in the project include: metals removal (Se, Hg, Zn, etc) from produced water in cold and warm climates; storm water treatment (old production pits) and new facilities (rainwater harvest and wildlife habitat); carbon sequestration from river diversions and coastal marsh restoration; PCB (Polychlorinated Biphenols) removal from ground water; and water soluble organic (WSO) compound removal (carbon, nitrogen, phosphorous). Based on an initial call, a draft proposal has been developed and is circulating among member companies to determine interest to pursue. To join the discussion, please contact Chevron's Jim Myers at [myersje@chevron.com](mailto:myersje@chevron.com)



# New Projects and Project Proposals

## **PERF 2009-01: Performance Evaluation of In Situ Chemical Oxidation of Petroleum Impacts in Soil and Groundwater, Proposal by Saudi Aramaco.**

Several PERF members are in the process of signing a contract that will result in an information-sharing collaborative project with the objective of evaluating in-situ chemical oxidation (ISCO) technology used to remediate petroleum contaminated soil and groundwater. This technology might be a cost-effective solution for clean-up of gasoline and diesel contamination in soil and groundwater at distribution facilities.

ISCO involves the introduction of a chemical oxidant into the subsurface for the purpose of transforming groundwater or soil contaminants into less harmful chemical species. The PERF members that plan to participate in this project include ExxonMobil/GES, Chevron, Shell, Saudi Aramco and BP. Participants will share their in-house information on ISCO. This information may include raw data from remediation field case studies, laboratory research, and field research. Other member's contribution will be to collaborate with a consultant, Aquifer Solutions, to provide and share raw data from ISCO remediation field case studies. Data from 58 sites are available for analysis and include application of different oxidants.

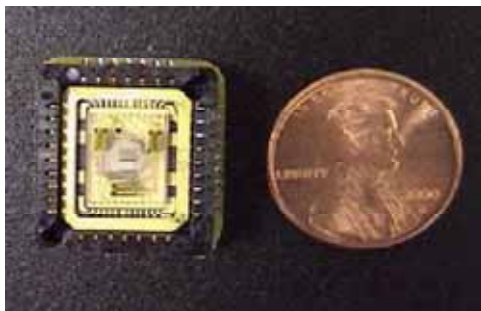
The final product of this project will be an ISCO best practices and guidance document to be compiled by Arizona State University. It is proposed to develop a contract with the PERF ISCO program to perform a best in practice study to improve the understanding of in-situ chemical oxidation for the remediation of petroleum source areas and dissolved phased plumes and capture lessons learned. Other interested companies should contact [Ramzi Hejazi, Saudi Aramco](#)



# New Projects and Project Proposals

## **PERF 2008-05: Chemical Sensors for Monitoring BTEX in Groundwater, Proposal by Chevron.**

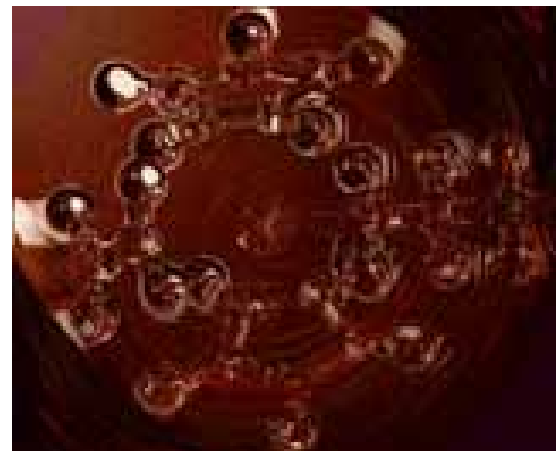
There is a huge potential to reduce future groundwater monitoring analytical costs and improve site characterization by deployment and remote monitoring of sensitive, inexpensive, selective chemical sensors. Currently such chemical sensors are not commercially available however there are some sensor designs reported in the literature that show potential for reaching the desired sensor goals. This project is aimed at evaluating the performance of such sensor devices to ascertain their sensitivity and selectivity in the presence of interferences in groundwater, with an end result of commercialization. This project will identify the application boundaries for the use of SAW and chemiresistor sensors to detect and quantify BTEX in groundwater. If feasible, the use of down hole BTEX sensors can significantly reduce the groundwater monitoring costs. Chevron has recently signed contracts for further work with Marquette University and CSIRO. At this point work has begun under existing confidentiality agreements. Interested member companies should contact Karen Synowiec ([Kasy@Chevron.com](mailto:Kasy@Chevron.com)).



## **2007-6 An Assessment of Substances in Refinery Effluents, proposal by ExxonMobil**

ExxonMobil proposes a PERF project to perform an assessment on refinery wastewater effluent substances that are the focus of EU legislation (i.e. Water Framework Directive (WFD) & European Pollutant Release & Transfer Register (EPRTR)). The objective of this project is to build a comprehensive database of effluent quality to inform the petroleum industry and provide benchmarking opportunities. The project will use results and guidance of a CONCAWE project studying effluent sampling techniques and analytical test methods of these targeted substances. This project will aim to identify substances of regulatory concern that are non-detectable in refinery effluents as well as those detected which may be the focus of future study. The collection of effluent samples from various refineries with different treatment facilities will enable a comprehensive and representative database to be developed. Effluent analysis is proposed to be done at an independent external research laboratory that has demonstrated expertise with the required test methods.

For further information, please contact Frank Kerze at [frank.j.kerze@exxonmobil.com](mailto:frank.j.kerze@exxonmobil.com) or (703) 846-2377.





# New Projects and Project Proposals

continued

## 2007-5 Membrane Bioreactor Demonstration, proposal by ExxonMobil

ExxonMobil proposes a PERF project to evaluate membrane bioreactor (MBR) technology as a viable alternative to conventional systems.

The study will determine if the wastewater treatment technology is comparable or superior in operability and effluent quality.

Advances in MBR technology have increased market growth and driven down capital cost.

While not yet commercialized or extensively tested for refinery wastewater, membrane bioreactors could lead to considerable benefits with:

- Reuse of effluent water
- Smaller bioprocess footprint
- Substantial reduction of effluent TSS
- Elimination of clarifier settling

challenges

The project will complete bench or pilot scale testing of a membrane bioreactor with side-by-side comparison to a conventional activated sludge system.

During the project, both normal as well as various upset conditions will be tested. Simulated upset conditions that could potentially harm or foul the membrane may include pH swing, oil & grease upset, high organic or nitrogen loading, and excessive debris/solids. Effluent from the MBR will also be analyzed for potential reuse applications in water utility systems.

For more information contact: James M. Phelan (703-846-3611).

[james.m.phelan@exxonmobil.com](mailto:james.m.phelan@exxonmobil.com)



## 2006-01 Whole Effluent Assessment (WEA), proposal 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 risk for 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](mailto:anne.basseres@total.com)).



# Recent Events

## PERF 80<sup>th</sup> MEETING FALL 2009

Academia and major oil companies shared experience, research and knowledge at the 80th meeting of the Petroleum Environmental Research Forum (PERF), held recently at Rice University in Houston. Sponsored by Saudi Aramco and Aramco Services Co. (ASC), the meeting attracted more than 50 delegates, who made technical presentations on the use of nanotechnology, electro-coagulation, membrane filtration, bio-traps and other methods to address environmental challenges related to oil production. The importance of industry and university collaborations was a key theme of the three-day event. Working together, we can bring forward new technology that supports the industry's environmental commitment and also helps communities around the world that are engaged in ecological initiatives such as clean water. In the opening presentation, Ramzi Hejazi, PERF board member at large for Aramco, noted that partnerships can provide academia with real-world situations to apply and test new technology. At the same time, industry benefits from access to top researchers, world-class laboratories, and high quality data and analytical tools. Mr. Hejazi also spoke about Saudi Aramco's history of supporting academia, including King Fahd University of Petroleum and Minerals and King Abdullah University for Science and Technology. Saudi Aramco engineering specialist Jim Findley gave an overview of the company's environmental technology and projects. In addition to oil companies, participants included representatives of Argonne National Laboratory, Clemson University, Louisiana State University, Memorial University of Newfoundland, Purdue University, Rice University, Stevens Institute, Texas A&M University, University of Houston and University of Saskatchewan, among others. ASC engineering supervisor Bob Finley served as the conference moderator and is the immediate past vice chairman of PERF. "PERF's role in helping identify promising research and bringing parties together has resulted in a reduction in the cost associated with taking on large technology projects, and it has also advanced the timeline on finding solutions to some key environmental challenges," Finley said. PERF is a research and development joint venture, formed in 1986 to provide a forum for the collection, exchange and analysis of research relating to development of technology for the health, environment and safety, waste in the petroleum industry. PERF has 15 member companies including Saudi Aramco, Chevron, BP, ConocoPhillips, ExxonMobil and Shell. [www.perf.org](http://www.perf.org).



Gathering for a photo during the PERF conference were, front row from left, Ramzi Hejazi, Rice University professor Mason Tomson and Jim Findley; and back row from left, Bob Finley and PERF chairman Todd Ririe.





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<b>Vice Chair:</b>	<b>Chad Shockley</b>
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<b>Teamwork</b>	<b>Together we achieve the extraordinary!</b>

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 research information relating to practical and theoretical science and technology concerning the petroleum industry and a mechanism to establish joint research projects in the field.

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

### PERF External Group Liaisons

PERF encourages external groups such as trade associations, national laboratories, and research institutions 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 and Technology Institute (GTI)  
 Lawrence Berkley 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)  
 Energy & Environmental Research Center (EERC)  
 VITO - Flemish institute for technological research

### Member Companies & Representatives

<b>Amerada Hess Co.</b>	<b>Gerry Bresnick</b>
<b>Saudi Aramco</b>	<b>Ramzi F. Hejazi</b>
<b>BP</b>	<b>Dave Fashimpaur</b>
<b>Chevron</b>	<b>Veronica R. Blackwell</b>
<b>ConocoPhillips</b>	<b>Sung-I Johnson</b>
<b>EniTecnologie</b>	<b>Patrizia Buttini</b>
<b>ExxonMobil</b>	<b>Jill Kerr</b>
<b>INA-Naftaplin</b>	<b>Domagoj Zelic</b>
<b>Petro-Canada</b>	<b>Doug Evans</b>
<b>Petrobras</b>	<b>Paulo Negrals Seabra</b>
<b>Repsol YPF</b>	<b>Marta García Ariza</b>
<b>Shell</b>	<b>Karen G. Haynes</b>
<b>Statoil</b>	<b>Stale Johnsen</b>
<b>Suncor</b>	<b>Anthony Congram</b>
<b>Total</b>	<b>Pierre Scherrer</b>

### Associate Members & Representatives

<b>BOC</b>	<b>Ram Ramachandran</b>
<b>Canadian Petroleum Products Institute (CPPI)</b>	<b>Adolfo Silva</b>
<b>Champion Technologies, Inc.</b>	<b>Ashley Dunham</b>
<b>Questor</b>	<b>Wilson McGarel</b>
<b>Veolia Water</b>	<b>Karim Essemiani</b>