



PERF Newsletter

Environmental,
Health,
& Safety
Solutions for the
Petroleum Industry

76th PERF Meeting
Environmental Challenges
of Heavy Crude Oils
October 17-18 Bartlesville, OK

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Board of Directors

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Legal Counsel:

F. Joseph Gormley, Esq.

ConocoPhillips will host the Fall PERF meeting. The dates have been set as **Oct 17-18**, and the meeting will be held in the ConocoPhillips Bartlesville Technology Center.

The theme for this PERF meeting is "Environmental Challenges of Heavy Crude Oils". with focus on industry applications for air, water, solids, and remediation. Prior to the technical meetings, the PERF Board will meet on October 16th.



ConocoPhillips

Hotel:

Each person is responsible for making his or her own hotel reservation. A block of rooms (*please include the words "PERF ConocoPhillips" when making reservations*) has been reserved at the Hotel Phillips until **September 30th**, 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 morning of September 30th, 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, with breakfast, at a cost of \$78.00 US dollars per person per night which is a special rate. Please make your reservation by September 30th to avail of this rate. The Hotel Phillips recommends that you call to make reservations to ensure you receive this discount.



ConocoPhillips Bartlesville Technology Center

The Hotel Phillips
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 Telephone: +1 (918) 336-5600
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 Web Site for the Hotel Phillips
<http://www.hotelphillips66.com/>

Maps: [Click here](#) for a Mapquest map.

In addition there are various maps on the Hotel Phillips website:
<http://www.hotelphillips66.com/map.html>
 which may be of help.

The Hotel Phillips is approximately 44 miles from Tulsa International Airport.

Taxi service to the Hotel Phillips would be approx \$85.00.

Rental Cars are available from most national providers.



Environmental Challenges of Heavy Crude Oils

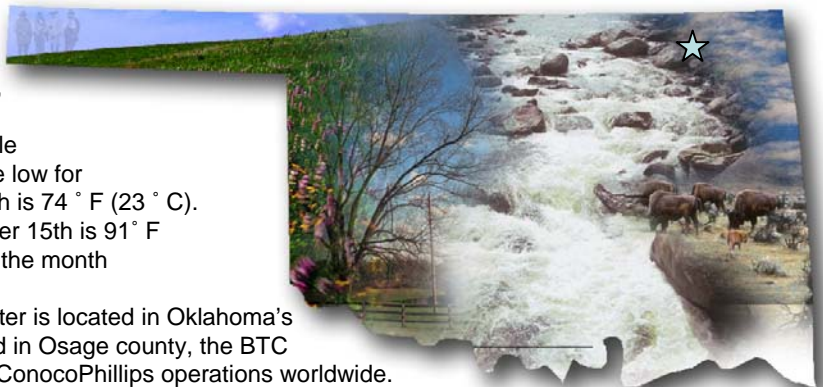
Heavy oil will play an increasing role in the industry's business in years to come, and this will impact operations from production in the field, through transportation, and finally through refining to the final product. Heavy oil can involve some new processes and challenges in each of these steps, including thermal and other specialized recovery mechanisms applied in the field, the need for handling of viscous materials and emulsions in transportation and storage, and additional steps and components in the refining process. In each of these steps there can be environmental issues that are introduced or made more challenging in dealing with heavy oil versus conventional resources. These include:

- Air Emissions - more intense energy use in recovery and handling of heavy oil (Examples: Energy efficiency, fugitive emission management, greenhouse gas capture technology, technology to reduce SO_x, NO_x, PM, VOC.)
- Water Use (Example: Steam in thermal processes, Water Metrics and Benchmarking)
- Solid Waste (Examples: Minimizing drill waste in the longer and more complex drilling for heavy oil, managing sulfur removal and disposal for heavy oil,)
- Wastes in General (Information needed on the chemical and physical properties and volumes of wastes generated by modern technologies for production and in situ upgrading of heavy crude oil.
- Land Use (Examples: Minimizing physical footprint of the more extensive field recovery processes for heavy oil, dealing with production in some key heavy oil opportunities in environmentally sensitive areas)
- Oil Water Separation and Water Handling (Examples: Emulsions in heavy oils - naphthenates in heavy crude create emulsions which are more of a challenge for oil and water separation, treatment of water recovered in thermal operations, waste water in heavy oil refining)

Oklahoma Weather in October

As Oklahoma's favorite son Will Rodgers said, "If you don't like the weather in Oklahoma, wait a minute.". October in Oklahoma is unpredictable with a wide range of temperatures. The average low for October is 51° F (10° Celsius). The average high is 74° F (23° C). However the record high temperature for October 15th is 91° F and the record low is 37° F. Average rainfall for the month is 4 inches.

The ConocoPhillips Bartlesville Technical Center is located in Oklahoma's Green country. Covering nearly 50 acres of land in Osage county, the BTC provides pilot plants and testing facilities for all ConocoPhillips operations worldwide.



New Projects Proposals

2007-6 An Assessment of Substances in Refinery Effluents—proposed 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 or (703) 846-2377.



2007-5 Membrane Bioreactor Demonstration—proposed by ExxonMobil

ExxonMobil proposes a PERF project to evaluate membrane bioreactor (MBR) technology as a competitive 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 (james.m.phelan@exxonmobil.com, 703-846-3611).



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 participation 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.



New Projects Proposals (Continued)

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 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).

Current Projects

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. A participation agreement including all the proposed work (Exhibit B's) was sent to all participating companies for their review and approval in July. It is anticipated that it will take several months for comments and additions to be considered and incorporated into a final agreement. A Fall meeting will be planned to work on the deliverable for this project. Contact person for the project is: Todd Ririe at todd.ririe@bp.com.

2004-06 Reducing Desalter Environmental Impacts Update

BP is coordinating a Petroleum Environmental Research Forum (PERF) project "Reducing Desalter Environmental Impacts". The objective of this project is to assess the performance of refining desalter systems when running various slates of Heavy Crude Oil, determine effects on desalter effluent characteristics, and evaluate desalter effluent treatment options.

This is a joint-industry project and currently there are eight participating companies: BP, ConocoPhillips, RepsolYPF, Total, Marathon, CITGO, Shell, and ExxonMobil. KBW Process Consultants is the primary contractor for the project. The project utilize a phased approach to survey issues relating to desalters, technology options, and then progress to a subsequent field test phase of promising technologies.

Pilot plant testing of different vendor technologies is starting up at Naperville. Data will be obtained from the test skid on separation of oil, water, and solids from brine mudwash andrag layer feed materials.

The project builds upon an earlier PERF project (91-14) knowledge base. It will provide better understanding of emulsion and rag layer fundamentals, new hardware technology, new emulsion breaking chemistries, and operational experience to the database. This project is especially relevant with the current trends are toward heavier crude slates, including bitumen, more asphaltenes, resins and emulsion precursors, higher solids content in crude, tighter environmental and product specifications are other issues to be addressed. For more information contact Dave Fashimpaur (fashimdn@bp.com)



PERF/DOE Air Program Review

A two day meeting was hosted by Argonne National Labs in Annapolis, MD on August 22 and 23 to review DOE sponsored air research. This two day meeting included presentations by DOE sponsored researchers from around the country on topics including modeling of air quality, air issues related engine and power generation units at oil field sites, assessing impacts from offshore facilities. Presentations were also made by industry representatives to facilitate the discussion of air issues faced by the oil and gas industry.

PERF CHARTER REVISION

Currently, Article IX of the Charter provides for dropping nonpaying members. The text of the article reads:

In the event that a Member has not paid any assessment within ninety (90) days after receipt of billing from the Treasurer, the account of such Member shall be considered delinquent. At the expiration of ninety (90) days, the Treasurer shall mail notice of delinquency to such Member by registered or certified mail. In the event the Treasurer has not received payment within thirty (30) days after the mailing of notice of delinquency, such Member shall be dropped automatically from the membership as of the end of such thirty (30) day period. Such Member, however, shall continue to be liable for its obligations accrued prior to such termination of its membership.

See Charter, Article IX., Payment Delinquency (the "Article"). To allow members with longer payment cycles to make payments, and to facilitate orderly keeping of PERF records and to insure fairness to all paying members, it is proposed that Article IX be amended to read as follows:

In the event that a Member has not paid any assessment within six (6) calendar months after the Treasurer's submission of same, the Treasurer shall send a reminder notice to the contact representatives for the Member. If the assessment is not thereafter paid within ninety (90) days the account of such Member shall be considered delinquent. After the account becomes delinquent, the Treasurer shall mail notice of delinquency to such Member by registered or certified mail. In the event the Treasurer has not received payment within ninety (90) days after the mailing of notice of delinquency, such Member shall be dropped automatically from the membership list as of the end of such ninety (90) day period. Such Member, however, shall continue to be liable for its obligations accrued prior to such termination of its membership.

This amendment will be considered at the next full PERF meeting.

PERF SLATE OF OFFICERS FOR 2008

Chairman: Todd Ririe; BP
 Vice Chair: Bob Finley; Aramco
 Treasurer: Karen Haynes, Shell
 Secretary: Vanessa Tassas, Total
 Former Chair: Dave Fashimpaur, BP

At Large: Jill Kerr, ExxonMobil
 Chad Shockley, ExxonMobil
 Roland Borey, Chevron
 Sung-I Johnson, ConocoPhillips
 To Be Announced, Repsol

PERF Summer Meeting

The PERF Summer Meeting was held June 12 and 13 in Belfast, UK at the Questor Centre at Queens University. The Questor Centre was founded in 1989 their stated key activity is: "application focused multidiscipline environmental research with a clear emphasis on technology transfer and exploitation".

Several of the PERF member companies are also part of the Questor consortium. The technical sessions on day one included talks on biological phosphorous removal, microbial processes for biodiesel and for clearing the air, along with new developments in biosensors and detection of microbes in soil samples. A review of Saudi Aramco environmental technology development and enhancement of colloidal mobility by organic matter talks ended the presentations on Day 1. A tour of the laboratory facilities at the Questor Center included a poster sessions with student researchers. Day 2 included presentations on new GC approaches to analytical analysis, innovative waste to energy solutions, groundwater monitoring technologies, recovery of organic pollutants using micro and nano encapsulation and novel materials as anti-biofouling agents.

PERF member companies can access all the presentations on the PERF web site at perf.org. The PERF business meeting included presentation of new project proposals on Refinery Effluent Assessment by ExxonMobil and Membrane Bioreactors also by ExxonMobil.



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Vice Chair:	Bob Finley
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Teamwork	Together we achieve the extraordinary!

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)

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.

Member Companies & Representatives

Amerada Hess Co.	Gerry Bresnick
Aramco Services Co.	Robert Finley
BP	Dave Fashimpaur
Chevron	Roland B. Borey
ConocoPhillips	Sung-I Johnson
EniTecnologie	Patrizia Buttini
ExxonMobil	Jill Kerr
INA-Naftaplin	Domagoj Zelic
Petro-Canada	David McIntyre
Repsol YPF	Marta García Ariza
Shell	Karen G. Haynes
Statoil	Stale Johnsen
Suncor	Anthony Congram
Total	Pierre Scherrer

Associate Members & Representatives

BOC	Ram Ramachandran
Canadian Petroleum Products Institute (CPPI)	Adolfo Silva
Champion Technologies, Inc.	Ashley Dunham
Pall	Tom Wines

