



SAFETY ALERT - #17-2009
INVERT DRILLING MUD AND POTENTIAL FOR WORKER EXPOSURE
RELEASE DATE: OCTOBER 9, 2009

Function: Drilling Operations	Date: September 10, 2009
Incident Type: Hazard Alert	Country and Region: Western Canada

Summary

Recent regulatory inspections by WorkSafeBC have resulted in oil and gas industry employers receiving Prevention Orders related to overexposure to harmful chemicals contained in hydrocarbon-based (invert) drilling mud systems.

Description of Hazard:

Oil and gas industry employers have conducted exposure risk assessments for operations where invert drilling fluids and other non-water based drilling fluids are being used. These exposure risk assessments have confirmed the potential for elevated exposures to oil mist and hydrocarbon vapour. Elevated oil mist and/or hydrocarbon vapours can exist in the vicinity of mud tanks and shakers on the majority of rigs assessed. Worker exposure can also occur when conducting cleaning operations on the rig floor or other areas of the drilling rig.

Oil mist and hydrocarbon vapours can have a variety of adverse health effects from acute or immediate to chronic or long term effects. These effects are largely dependent on the exact constituents of the oil mist and/or vapour and the route of exposure (skin verses inhalation) and can include rashes, irritation of the respiratory tract, pneumonia, depression of the central nervous system and cancer. As a function of this airborne hazard, personnel working in these areas for prolonged periods are at an increased risk of overexposure.

To properly mitigate these risks and to be in compliance with WorkSafeBC regulations, an exposure control plan may be required. Other provinces have similar expectations.

Other Important Information

1. A great deal of work has already been completed by our industry with respect to the use of hydrocarbon based (invert) drilling fluids. This work is reflected in Enform's IRP-14 as well as a number of Enform safety alerts. Unfortunately, industry awareness and conformance with IRP-14 is limited.
2. The broader solution to health exposure issues while drilling requires a comprehensive and collaborative approach that involves the producers, drilling contractors and drilling fluid suppliers. This approach includes the following elements:
 - fluid selection (responsibility of producer);
 - exposure control plans (all parties);
 - engineering controls at the mud tanks and shakers (all parties); and
 - awareness and training on invert (all parties).
3. The International Association of Oil & Gas Producers (OGP) has published a guide for drilling personnel, managers and health professionals in the oil and gas industry titled "Drilling Fluids and Health Risk Management". This document is a useful reference guide for those planning operations, assessing worker hazards or developing an exposure control plan.



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4. OH&S regulations (i.e. BC OHSR Section 5.54) require exposure control plans must be implemented when "a worker is or may be exposed to an air contaminant in excess of 50% of its exposure limit." Exposure control plans must include the following elements:
- a statement of purpose and responsibilities;
 - risk identification, assessment and control;
 - education and training;
 - written work procedures, when required;
 - hygiene facilities and decontamination procedures, when required;
 - health monitoring, when required; and
 - documentation, when required.

Recommendations for Preventing Worker Exposure to Hazardous Substances:

Important hazard identification and control recommendations include:

- Each company will be required to evaluate the potential for worker exposure and take steps to eliminate or reduce the risks with consideration given to the following areas.
 - Ventilation to be reviewed where applicable to reduce the exposure to chemicals and contact with workers.
 - Where possible reduce the amount of time that workers are required to work in areas where oil mist exists. This includes moving the tasks to a different area if applicable.
 - Workers to wear appropriate PPE when required to work with oil based muds.
 - Companies are required to evaluate their current awareness tools and training programs to address the challenges related to chemical exposure.

Workers to be considered includes all parties working on/off site with potential exposure to oil based fluids. (e.g. Geologists, Vacuum Truck Haulers, etc)

- Producers need to be aware of the fluids being used for drilling operations and the associated health, safety, and environmental risks. Only use fluids that conform to IRP-14 guidelines. Other areas of concern include the use of additives, return fluids that absorb formation gas or liquids, and heating of fluids.
- Drilling companies using hydrocarbon-based mud systems may need to develop and implement an exposure control plan that mitigate the health risks and mitigates potential worker health risks.

Other Useful Links:

- Enform: [IRP Volume #14 - Non Water Based Drilling and Completions / Well Servicing Fluids](#)
- International Association of Oil & Gas Producers: [Drilling Fluids and Health Risk Management](#)
- Canadian Association of Petroleum Producers: [Oil Mist Monitoring Protocol](#)

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This Safety Alert is designed to prevent similar incidents by communicating the information at the earliest possible opportunity. Accordingly, the information may change over time. It may be necessary to obtain updates from the source before relying upon the accuracy of the information contained herein. This material is presented for information purposes only. Managers and supervisors should evaluate this information to determine if it can be applied to their own situations and practices.