



Department of Mines and Petroleum
Department of Water

GROUNDWATER MONITORING REQUIREMENTS FOR ONSHORE PETROLEUM ACTIVITIES



Information Sheet for Landholders

August 2016

Background

The Department of Mines and Petroleum (DMP), in partnership with the Department of Water (DoW), has prepared this information sheet to answer commonly asked questions from landholders about groundwater monitoring associated with onshore petroleum activities.

Groundwater resources are vitally important in Western Australia, being utilised for drinking water supplies, agricultural and industrial uses, including petroleum activities. Groundwater management and protection also contributes to the ongoing health of wetlands, native vegetation and ecosystems. Any land uses and activities that may impact on groundwater need to be managed in accordance with legislative requirements and monitored to ensure that groundwater quality and quantity remains protected.

Why are petroleum companies interested in establishing groundwater monitoring bores on my land?

When petroleum wells are drilled they may intersect groundwater while targeting oil and gas in deeper geological formations. It is important that 'baseline groundwater monitoring' is undertaken to understand and establish the groundwater levels and quality before petroleum activities commence. In addition, 'surveillance monitoring' continues while the petroleum activity is being undertaken to determine if there are any changes to groundwater levels or quality in comparison to the baseline data and whether any changes can be attributed to the petroleum activities. Monitoring may also continue after the activity is completed.

What is the difference between a petroleum well and a groundwater monitoring bore?

A petroleum well is constructed to high standards using multiple layers of steel and cement and designed to withstand high pressures deep underground. Groundwater bores are usually made from plastic and are designed to access groundwater. Unlike groundwater bores, petroleum wells are stronger structures designed to prevent any contact with groundwater. Even though petroleum wells and groundwater bores may be located close to one another, the risk of interaction is minimal and not expected to occur.

Will a petroleum company want to access my groundwater bore or will they construct new bores?

Petroleum companies are required to negotiate with landowners for access to their land when exploring for oil and gas. A [Land Access Agreement Template](#) has recently been developed by the Australian Petroleum Production and Exploration Association (APPEA) in conjunction with the Western Australian Farmers Federation, Pastoralists and Graziers Association, and Vegetables WA. The template outlines the responsibilities of the petroleum company and the landholder. Access to existing water bores, or construction of new bores, may form part of an agreement.

When will groundwater monitoring commence?

Petroleum companies may approach private landowners months, or even years, before starting an activity. If the landholder agrees, groundwater monitoring may commence at any time. Having groundwater monitoring data carried out over a one to two year period prior to commencing petroleum drilling is beneficial for understanding existing groundwater levels and quality. Groundwater levels or quality may change over time due to rainfall, groundwater use and other land uses.

What information will be collected when monitoring groundwater?

A variety of information will be collected in order to understand groundwater characteristics. Each groundwater sampling visit may take anywhere between 30 minutes and three hours. The following information is typically collected when sampling groundwater:

- groundwater levels (depth to groundwater)
- concentration of chemicals (major ions, hydrocarbons, metals, etc.)
- physical parameters (pH, dissolved salts, temperature, turbidity, etc.).

Landowners may also negotiate with the petroleum company to sample specific water quality parameters of interest.

How often will sampling occur?

Generally sampling will occur every three to six months. However, the sampling frequency may vary depending on the petroleum activity, location and how rapidly groundwater levels and quality changes over time. More frequent monitoring may be required where there is limited historic groundwater information available.

How long will monitoring occur?

Groundwater monitoring may commence months or years prior to petroleum activities and is expected to continue as long as activities continue. In some instances monitoring may continue for one or two years after the completion of petroleum activities to ensure that the site has been appropriately rehabilitated to meet closure objectives.

Will monitoring occur in existing groundwater bores?

Private landowners may have existing monitoring or production water bores they want the company to use. Existing bores will only be accepted for long term monitoring if they are in a suitable location, condition and are easily accessible. The petroleum company may request landowners provide any bore records such as geologic logs, groundwater level data, groundwater quality data, well construction and pumping information that are available.

Will I be provided with the groundwater monitoring results?

The petroleum company is expected to provide landowners with groundwater monitoring results. It is recommended that during the land access agreement negotiations a discussion takes place regarding the requirement for the company to provide the groundwater data. This may include specific groundwater monitoring data and reports. DMP encourages this discussion as it will improve the landowner's understanding of the groundwater quality and help to build a positive relationship with the petroleum company.

Who pays for a new groundwater bore and will I be entitled to keep it?

The petroleum company is responsible for paying for any new water bore construction costs, groundwater sampling and laboratory analysis costs. Landowners should discuss the terms of access and use of any new bore with the petroleum company. The construction requirements for monitoring bores and abstraction bores are different so the possible future use of the groundwater bore must be discussed during land access agreement negotiations. If at any stage the bore is going to be used for water abstraction (outside of monitoring activities), then a license must be sought from the DoW. As part of the land access agreement landholders may request to keep the water bore instead of the petroleum company decommissioning the bore.

Should I expect water quality to change in my groundwater bore?

A variety of chemicals occur naturally in groundwater. The amount of each chemical in the groundwater varies widely according to the type of geology, water sources and surrounding land uses. Chemicals which are commonly observed in groundwater include bicarbonate, calcium, chloride, magnesium, silicon, sodium, and sulphate. Some metals and hydrocarbons (eg. methane) may also be naturally present in groundwater.

Petroleum activities are not expected to alter chemical concentrations in groundwater, nor present a risk to agricultural or domestic water supplies.

What happens if chemical concentrations increase over time?

Chemical concentrations in groundwater are expected to vary seasonally. This is natural and is not cause for concern. However, if any chemical concentrations begin to increase to levels which exceed groundwater guidelines/limits, or if hazardous chemicals are found, further investigation will be needed to identify the source.

If the petroleum company identifies changes to the groundwater quality that exceed guideline levels during the monitoring process, the company is required to inform DMP, DoW, the landholder and other relevant departments (as per the land access agreement). The company will then be required to undertake an investigation to determine whether the change in groundwater quality is due to their activities, a natural occurrence or other land uses. If the company is responsible it will be required to undertake appropriate remediation activities.



WHO TO CONTACT FOR FURTHER INFORMATION

For issues relating to groundwater monitoring of petroleum activities, please contact:

Department of Mines and Petroleum (Environment Division)

Email: petroleum.environment@dmp.wa.gov.au

Tel: +61 8 9222 3333

www.dmp.wa.gov.au


For issues relating to water allocation, groundwater information, constructing bores or water licensing, please contact:

Department of Water (nearest regional office)

Email: Atrium.Reception@water.wa.gov.au

Tel: +61 8 6364 7600

www.water.wa.gov.au/contact-us



Government of Western Australia
Department of Mines and Petroleum
Mineral House, 100 Plain Street
East Perth, Western Australia 6004

Tel: +61 8 9222 3333
Fax: +61 8 9222 3862
Email: dmp@dmp.wa.gov.au
Web: www.dmp.wa.gov.au