

Botany Sands Aquifer Groundwater Strategy Frequently Asked Questions

About the strategy

- ***Why has the Government introduced a ban on the domestic use of groundwater in some areas near Botany Bay?***

Land in the Botany Bay area has been heavily used by industry for over 100 years. Some of these industries have resulted in contaminants such as chlorinated hydrocarbons (such as petrol and diesel), some heavy metals such as chromium and nickel, lead and also arsenic accumulating in the earth and leaching into the groundwater.

Following the discovery of high level of contaminants in 2003, the NSW Government has been actively managing the extraction of groundwater in the Botany area. In August of 2003, the Groundwater Extraction Exclusion Area was set up around known contamination plumes originating from historical activity at the former ICI Petrochemical complex (the Orica site). That area was expanded in 2005 following further examination of available data.

Examination of other contaminated sites, coupled with the increase in groundwater use due to the current record-breaking drought, has resulted in the NSW Government extending the current management strategy for groundwater in the area. We are taking further precautionary action to ensure public health is not put at risk from exposure to potentially contaminated groundwater.

In addition to the site clean-ups currently underway, the NSW Government has introduced a ban on the use of groundwater for domestic purposes in three new management zones within the aquifer area. This includes using water for watering gardens, washing cars, drinking and other domestic purposes. Access to the mains water supply is not affected.

The NSW Government will provide free bore water testing for all licenced domestic and recreational irrigation bore users in Zones Two, Three and Four. Free advice on any possible health risks will be provided to licenced domestic groundwater users.

The extension of the NSW Government's management action involves a number of strategies:

1. The introduction of a ban on the use of groundwater for domestic purposes within the three new management zones.
2. A requirement for industrial users of groundwater within Zones Two, Three and Four to have that water tested at least annually.
3. A requirement that the results of those tests be provided to NSW Government authorities to ensure the water is fit for the purpose it is being used for (for example water being used in a confined cooling process need not be of the same quality as water being used for cleaning which may come into contact with employees). This information will help the NSW Government gain a better understanding of the extent and nature of any contamination in the area.
4. A request that any person who suspects contamination alert NSW Government authorities via the Botany Groundwater Hotline 1800 237 012.



5. The free testing of bore water for any licensed domestic and recreational irrigation bore users in Zones Two, Three and Four. For domestic users, these results will be provided to NSW Health who can offer advice on any possible health risks.

The NSW Government has established a Botany Groundwater Hotline on **1800 237 012** to handle all inquiries from residents and businesses in the affected area.

- ***Where does the extension of the strategy apply?***

The whole of government approach involves the creation of a new management area within the aquifer where bore water use is banned for domestic purposes. It has been divided into four management zones.

- Zone One: Comprises the existing Groundwater Extraction Exclusion Area around the Orica site. Management for this zone will not change as a result of the strategy.
- Zone Two: Comprises an area from the airport in the south, to South Dowling Street in the north-east. It includes the suburbs of Rosebery, Zetland, Waterloo, Redfern, Sydenham and Tempe, as well as parts of the suburbs of Erskineville, St Peters, Alexandria and Surry Hills.
- Zone Three: Comprises the area between the airport and the current Orica site, extending from Botany Bay in the south to the goods railway line in the north.
- Zone Four: Comprises the area south-east of the current Orica site, extending to Bunnerong Road in the east, Australia Avenue in the north, and Botany Bay in the south.

The remainder of the northern zone of the aquifer remains a general use area for groundwater, and bore users in these suburbs are not affected by the management strategy. However, the existing embargo on new bore licences will remain.

- ***How do you know the groundwater in other parts of the aquifer is safe to use?***

The general flow in the north Botany aquifer is towards Botany Bay, with minor divergences in the direction of surface water features such as the Alexandria Canal, Botany Ponds/wetlands, Floodvale drain and Springvale drain. The proximity of a known source of contaminantation is critical in determining what areas are likely to be contaminated. Areas immediately downstream of a contaminated site are most at risk. The new management zones are largely derived from known sites and industrial history in the area.

Government experts from the NSW departments of Natural Resources (DNR) and Environment and Conservation (DEC), as well as independent experts, have confirmed that it is not considered necessary to include area to the north east of the airport and between Mascot and West Botany as the upstream areas have limited history of industrial activity.

- ***How will I know if the groundwater in my household bore is contaminated?***

The NSW Department of Natural Resources will provide free bore water testing for concerned licenced domestic and recreational irrigation bore users in Zones Two, Three and Four. For domestic licence holders, the results of these tests will be provided to the licence holder and NSW Health, who can then advise on any possible health risks free of charge.

It should be remembered that groundwater moves constantly. Consequently, if a householder has a test conducted and no contaminants are found, the ban on domestic use of groundwater will remain in place.

Eligible bore users wishing to have their bore water tested should contact the Botany Groundwater Hotline on **1800 237 012**.

The NSW Government will not be providing free tests for residents who have been illegally accessing and using groundwater. If a resident with an unlicensed bore wishes to conduct tests, they will need to arrange and pay for the tests themselves.

Residents in Zone One (the Orica site) have been advised over the last three years not to access bore water. The free bore water tests and health advice do not apply in this area.

Background to extending the management strategy

- ***How long has the groundwater been contaminated for?***

There is a legacy of contamination in the area that dates back over 100 years of industrial use.

Some of this industrial use has led to contamination of the groundwater in the Botany Sands Aquifer. There are eight known contaminated sites in the area and DEC is making sure these sites are being cleaned up or contained so they no longer pose any significant risk. Four of these sites have already been cleaned. In addition, controls on groundwater use are implemented by DNR as required.

Given the history of the area, there may also be further contaminants. The NSW Government has decided to implement a precautionary strategy for managing this issue, which will compliment the existing case-by-case management approach already being used in the area, with a ban on the domestic use of groundwater in the area, and more strictly regulating industrial use of bore water. The precautionary aims to ensure that public health is not put at risk from people using potentially contaminated groundwater.

Examples of the existing case by case management approach used in the area include:

- The remediation of four separate sites which DEC is currently regulating;
- Individual plans for four additional sites which are currently being developed under DEC's regulation; and
- The \$165 million clean up program currently underway on the Orica site at Botany. As part of this remediation, a domestic Groundwater Extraction Exclusion Area around the Orica site was implemented in 2003. This

exclusion area was expanded in 2005 after an increase in the area affected by the contaminated plume was discovered, along with an embargo on any further bore licences in a larger area.

About the contaminated sites and groundwater

- ***How many contaminated sites are there in the area?***

Botany and its surrounding suburbs have been heavily used by industry for at least 100 years. This was largely before any environmental controls were in place and basic measures to prevent pollution were not considered. This legacy is what we are now dealing with, in Australia and around the world.

NSW has the most robust contaminated land management legislation in Australia. There are currently eight sites which DEC regulates under this legislation in the new management zones. Four of these sites have been cleaned up and the remaining four are either in the process of being cleaned up or have a site plan in development now.

There are also nine landfills in the management zones that are now contained as parklands and golf courses and there would be a number of existing contaminated sites that remain suitable for their current industrial uses and are addressed by councils through local planning controls.

- ***What contaminants have been found at these sites?***

Given the extensive history of industrial use, there is a range of chemicals, which are affecting groundwater in different concentrations. A range of industries operated in the area such as tanneries, metal platers, service stations and depots, landfills, dry cleaners and wool scourers.

These industries operated for many decades without any environmental controls causing groundwater contamination. We are concerned about chlorinated hydrocarbons and other solvents, petroleum hydrocarbons (such as petrol and diesel), some heavy metals such as chromium, nickel, lead and also arsenic in the aquifer.

- ***What has caused this contamination?***

There is a legacy of contamination in the area which dates back for more than 100 years of industrial use. In NSW, a law in 1869 dictated that all 'noxious industries' must be situated in the Botany area. Environmental controls are a relatively new concept and as a result of some of this historical land use, groundwater has become contaminated.

The area housed a range of industries such as tanneries, metal platers, service stations and depots, landfills, dry cleaners and wool scourers.

Contamination from industries like this is a problem that countries around the world first began noticing in the late 1980s. The NSW Government has been actively regulating the clean up of industries in the Botany area since then - the first clean up of a contaminated site was completed in Matraville in 1992. There are currently eight sites where a clean up program is being regulated by DEC. Half of these sites have already been remediated and a further four have plans underway or are in the midst of a clean up.

The Botany Sand Aquifer has historically been an area of high rates of industrial activities. For example, an industrial corridor has existed in Zone Two since the 19th century, and over the years a number of industries have been situated there, including tanneries, wool scourers, electroplaters, dry cleaners, printing works and manufacturers. Storage of chemicals in underground tanks was also common.

In Zone Three, there was a high concentration of tanneries and wool scourers between the 19th and mid-20th centuries, while the area in Zone Four has contained an oil refinery, a power station and several chemical works.

While the scale of industry has been reduced in many areas of the new management zones, the long-term land use in the area has led to the cumulative degradation of the groundwater.

- ***What's being done to clean up the groundwater?***

The largest example is the Orica site at Botany where a massive \$165 million program involving the pumping and cleaning of groundwater is underway. The site is regulated by DEC.

A further four sites have been cleaned up which were affecting groundwater quality, which is a significant improvement. Another four sites are either in the process of being cleaned up or have a site plan in development now.

Given the extensive history of heavy industry, it can be very difficult to identify exactly where contamination comes from, particularly because many of the industries are no longer operating.

The most important thing is to make sure the community and the environment are protected. That's why the NSW Government is regulating the clean up of several sites. However in some cases where full remediation is not feasible, other actions are taken to protect the community such as restricting access to groundwater bores.

- ***What are the exact concentrations of the contaminants in the groundwater?***

The Botany Sands Aquifer is in constant motion and there are many levels of underground water. As a consequence the levels of contaminants will fluctuate over time. Consequently, the NSW Government is taking a precautionary approach and banning domestic groundwater use in three new management zones.

Commercial users will be obliged to test their water at least once annually and DNR and DEC (in conjunction with NSW Health and Workcover) will ensure that it is fit for purpose and does not provide an undue risk to those using it.

Health risks

- ***What are the health risks associated with coming into contact with the groundwater?***

This will partly depend on the nature and level of any contaminant present. Past use of the land above the aquifer will be able to give a broad indication of the potential health risk. In general, land that was previously used for industrial purposes would pose a greater hazard. Risk to health will also depend upon the route, frequency and duration of exposure.

Within the new management zones there has been a history of intensive industrial land use by a range of industries such as tanneries, metal platers, service stations and depots, landfills, dry cleaners and wool scourers. Some of the chemicals that may have contaminated the aquifer include chlorinated hydrocarbons and other solvents, petroleum hydrocarbons (such as petrol and diesel), some heavy metals such as chromium, nickel, lead and arsenic. There are currently eight sites that are regulated in the new management zones that may pose a “significant risk of harm” to the environment or human health.

As the area covered by the new domestic ban on groundwater use is more likely to have been contaminated by past industrial use, residents should not use groundwater from this area for any purpose. This advice is being issued as a precaution to protect public health.

- ***What should I do to avoid risk associated with coming into contact with groundwater?***

Current NSW Health advice is that in an urban setting, where there is ready access to reticulated drinking water, then that supply should be the only source of water for drinking. People should not drink groundwater from any part of the Botany Sands Aquifer.

Residents in the new management zones should not use the groundwater for any domestic purpose.

- ***What can be done to see if I have been at risk from my bore water?***

Testing groundwater from a domestic bore may be able to better inform the user whether there is any health risk associated with its use. If a licenced domestic or recreational irrigation groundwater user has concerns, DNR will conduct one free test of their bore water to determine if any contamination is present. These results will be provided to the groundwater user and NSW Health. NSW Health can provide free advice on any possible health risks.

- ***Is it safe to eat fruit and vegetables watered by groundwater in the area?***

It is believed that some contaminants can accumulate in fruit and vegetables, although the extent of accumulation depends on the type of crop, the amount of water



used, the concentration of the contaminant and the nature of the soil. We are advising bore water users in the management zones not to water any food crops with groundwater, and not to consume any food which has previously been watered with groundwater. Fruit and vegetables grown in the four zones and watered by using the normal mains supply or a properly maintained rainwater tank are safe to eat.

- ***Who can I contact if I have any concerns over the health risks?***

Residents concerned about possible health risks from previous exposure to groundwater in the advisory area are encouraged to contact South Eastern Sydney Illawarra Public Health Unit on 02 9382 8333, or by writing to the Director, Public Health Unit, Locked Bag 88, Randwick NSW 2031.

Impact on households and industry

- ***How many households are likely to be affected?***

There are approximately 16,000 households in the new management zones, however only a small number of these access and use groundwater. While there are currently about 200 licensed bores in Zones Two, Three and Four, only 28 of these are domestic licences and subject to the new ban. We will issue letters to all licence holders advising them of the strategy and what they should do.

- ***Why are businesses able to use groundwater while householders can't?***

Groundwater used for industrial purposes is less likely to come into human contact than that used for domestic purposes. Businesses also invest heavily in infrastructure to access and use groundwater and are able to meet the costs of regular water quality testing.

About monitoring groundwater quality:

- ***If I want to get my bore water tested who do I contact?***

If you live near the Orica site, Orica may be able to test your bore water free of charge - contact Orica on 1800 025 138 to find out. Otherwise you will need to contact DNR. It is not possible to reliably conduct the water sampling and testing yourself.

All domestic and recreational irrigation licenced bore users in the Zones Two, Three and Four are eligible for free bore water testing conducted by DNR. Contact the Botany Groundwater Hotline on 1800 237 012 for more information.

About the Botany Sands Aquifer

- ***What is the Botany Sands Aquifer?***

The Botany Sands Aquifer is a large volume of underground water present in the sandy ground surrounding Botany Bay. The groundwater is unusually close to the



surface and in some cases, almost right at the surface. There are three general areas to the aquifer: the northern, eastern and southern areas. The northern area is the area affected by the current contamination concerns. The aquifer is highly vulnerable to contamination due to the permeability of the sands, the shallow soil cover, and the generally shallow water table. Any contamination from land use activity that escapes or is spilled onto the ground is likely to accumulate in the earth and leach into the groundwater. In some cases contaminants may infiltrate the ground rapidly and reach the water table at near original concentrations.

- ***What should this groundwater NOT be used for?***

Groundwater from the Botany Sands Aquifer should not be used as a drinking water supply. This is due to the multitude of possible contamination sources generally found in urban areas and the potential for unknown contaminants to exist within the groundwater.

- ***How can groundwater users help protect the health of the Botany Sands Aquifer?***

Groundwater users in the Botany Basin can help protect the health of the Botany Sands Aquifer through good housekeeping practices. This includes avoiding greywater reuse on gardens, minimising fertilizer application, and storing and disposing of chemicals, waste fuel and paints safely. Nothing should be poured into the ground.