

Community Newsletter

Botany Groundwater Cleanup Project

Issue 16

Update from Community Liaison Committee Meeting

September 2004

Welcome to the Community Newsletter for the Botany Groundwater Cleanup Project. The aim of this Newsletter is to provide an update from the Botany Groundwater Community Liaison Committee and a detailed overview of Orica's activities across the Project.

This edition of the Quarterly Newsletter provides a snapshot of what has been published in Orica's regular *Southern Courier* columns. Also featured is a report back from the Community Liaison Committee (CLC) meeting held on 26 August and an invitation to our third community workshop on the Environmental Impact Statement (EIS) for our proposed Groundwater Treatment Plant

Distribution

This newsletter is distributed throughout the suburbs neighbouring Orica's Botany site, including Banksmeadow, Botany, East Botany, Pagewood, Hillsdale and Matraville.

Improving overall communication with the community

Orica continues to provide regular community updates on the details of its Botany Groundwater Cleanup Plan through the *Southern Courier*. We intend to publish the columns on a weekly basis until the end of the year.

In addition, we have produced a series of Fact Sheets that provide simple and easy to understand information on the environmental science and technology involved in this project. The Fact Sheets are available on our website.

Our dedicated website provides public access to a wide range of technical documents on the Project, including the Groundwater Cleanup Plan and Orica's Progress Reports to the EPA, as well as a complete listing of our *Southern Courier* columns.

Project developments (highlights from recent *Southern Courier* columns)

Bioremediation Field Trials

Interim results from the bioremediation field trials, which Orica started in February this year, were reviewed in early July. The results were less promising than we had hoped and suggested that some of the properties of the groundwater may be making it difficult for the naturally occurring bacteria to achieve a good breakdown rate of the pollutant chemicals.

Orica has decided that bioremediation results are unlikely to achieve positive results in time to achieve the Groundwater Cleanup Plan deadlines. Orica has now suspended immediate work on work relating to full-scale bioremediation and is focused on hydraulic containment alternative projects.

Orica will still complete the bioremediation field trials as we believe they offer real long-term opportunities for a less intrusive and energy-efficient solution to treating the contaminated groundwater.

Statutory Approvals

A recent amendment to NSW Government legislation has streamlined the process for obtaining the statutory approvals that Orica is required to have in place for this project.

The *State Environment Planning Policy No. 55 – Remediation of Land (SEPP 55)* has been amended so that any development or activity carried out for the purpose of complying with an EPA Notice of Clean Up Action may be carried out without development consent. Orica will still need to obtain a range of permits, licences and approvals from relevant authorities to undertake the works as well as ongoing consultation with the community.

Dioxins & Thermal Oxidation

The Groundwater Treatment Plant being proposed by Orica will use a thermal oxidation process that can emit very low levels of dioxins, which are well within Australian regulations. Because of the level of interest around the technology assessment, we encourage you to attend our community workshop on 15 September where there will be an opportunity to discuss these issues in more detail.

There is also more information available from the Commonwealth Department of Environment and Heritage's report "Dioxins in Australia: a summary of the findings of studies conducted from 2001 to 2004" (www.deh.gov.au).

Update on Botany Groundwater Cleanup Project

Overall the Project is progressing well and Orica is on track to prevent the contaminated groundwater from reaching Botany Bay. The most significant developments are:

- Work on building the tanker loading facility, transfer pipeline and recommissioning the steam stripping unit is on schedule and should be operational from October. Once operational, we can start pumping the groundwater from extraction wells on Orica land and Foreshore Road and transfer it via pipeline to the SSU for treatment.
- Work has commenced on Foreshore Road, where we are installing approximately 40 extraction wells and building an underground pipeline from these wells to Orica's Southlands site. Construction should take 30-40 weeks. It is expected that these works will have minimal impact on the surrounding area.

Botany Groundwater Cleanup Project

Highlights from CLC Meeting, 26 August

Niall Johnston of the NSW Department of Environment and Conservation provided an update on Orica's progress from a regulatory perspective. Bruce Gotting, Orica's Botany site environment manager, presented a status report on the monitoring works and cleanup project. Orica is on track to prevent the contaminated groundwater from reaching Botany Bay.

Chris Jack from URS Australia, who are preparing the EIS on behalf of Orica, also provided the CLC with an overview of the Environmental Impact Statement on the Groundwater Treatment Plant.

Technology Assessment

The main focus of the CLC meeting was the presentation on the assessment of cleanup technologies by the Project's technical manager, John Lear. This included a discussion on the alternative technologies assessed by Orica and how we arrived at choosing our preferred treatment technology of air stripping with thermal oxidation.

John started the presentation by explaining the criteria Orica used for assessing the technologies, which are:

- It can be done in time (i.e. ready to operate by August 2005).
- It works (i.e. successfully proven and operating).
- It can treat the volume (i.e. treats 15 ML/day).
- It meets Orica's specification (i.e. safe, capable and proven to destroy contaminants).

In short, Orica requires a large scale, safe and robust operation to stop the contaminated groundwater from reaching Botany Bay.

To start the assessment, Orica firstly looked at options for treating the contaminants in the water after it has been pumped out of the ground. Such options include biological treatment, advanced oxidation and activated carbon. Whilst all these options have

many positive aspects, they do not meet all the criteria listed above.

Orica then examined options for extracting the contaminants from the groundwater after it has been pumped out of the ground for treatment.

Steam stripping was one of the options considered. As we have reported previously, Orica is in the process of recommissioning the steam stripping unit (SSU) on Botany Industrial Park as an interim measure to treat the contaminated groundwater. (More information on the steam stripping process is available as a Fact Sheet on our website – www.oricabotanygroundwater.com)

Whilst the SSU will work as an interim measure, it does not have the capacity to treat the large volumes of groundwater that are required for this project. When operated at a large scale, significant quantities of liquefied organics will be collected which need to be destroyed.

Options for liquid destruction of the contaminants were assessed:

Ecologic - a high temperature (850 °C) chemical reduction with hydrogen. A disadvantage of this method is that there are no plants in current operation anywhere in the world that can be reliably assessed.

Base Catalysed Decomposition (BCD) – a reaction in an elevated temperature (300 °C) and pressure in a caustic soda and oil mixture. This process produces significant amounts of waste for disposal. Operators have also informed Orica that BCD is not suitable for the destruction of EDC.

Plasma Arc – contaminants are destroyed in high temperature (8000 °C) plasma. Although this treatment method is used in other parts of Australia, it consumes a large amount of power and is difficult to operate and maintain.

Thermal Oxidation – The most proven and robust technology for destruction of the liquid waste is thermal oxidation.

Air stripping was discussed and demonstrated that it is a widely used, well proven technology for treating this type of groundwater contamination.

The air stripping process works by firstly extracting the groundwater, then pumping it into a feed tank, where it is acidified by dosing it with hydrochloric acid to reduce the chance of fouling the air strippers. The acidified water is then pumped into the air stripper. Air stripping is then performed by blowing air up through a falling column of the water, transferring the contaminants from the water to the air. The water and air are treated separately.

Destruction of the dilute contaminants in the air stream from the air strippers was also discussed. Thermal oxidation is recommended in the European Commission IPPC Best Available Technology for similar chlorinated organic vent streams. (More information on thermal oxidation is provided below).

Aker Kvaerner, a leading international engineering design company, was engaged to investigate the engineering feasibility of air stripping with thermal oxidation, and of steam stripping (without liquid destruction). They found that both technologies were feasible, and provided preliminary sizing and operational data.

After examining all the available options against the criteria (including minimising hazardous inventory and publicly available reference data), Orica's assessment – concluded that air stripping with thermal oxidation is the most proven, reliable and safest technology available.

Thermal oxidation

John then provided a detailed presentation on thermal oxidation, including different types of thermal oxidisers and the international performance criteria for these units.

Once air stripping has been performed, the contaminants are destroyed in the air stream as they can't be sensibly removed for destruction. To destroy the contaminants, they are reacted in an oxygen rich atmosphere at high temperature (850-1000 °C). The chemicals are broken down into simpler chemicals (eg carbon dioxide, water vapour, hydrogen chloride, chlorine) for safe disposal.

Botany Groundwater Cleanup Project

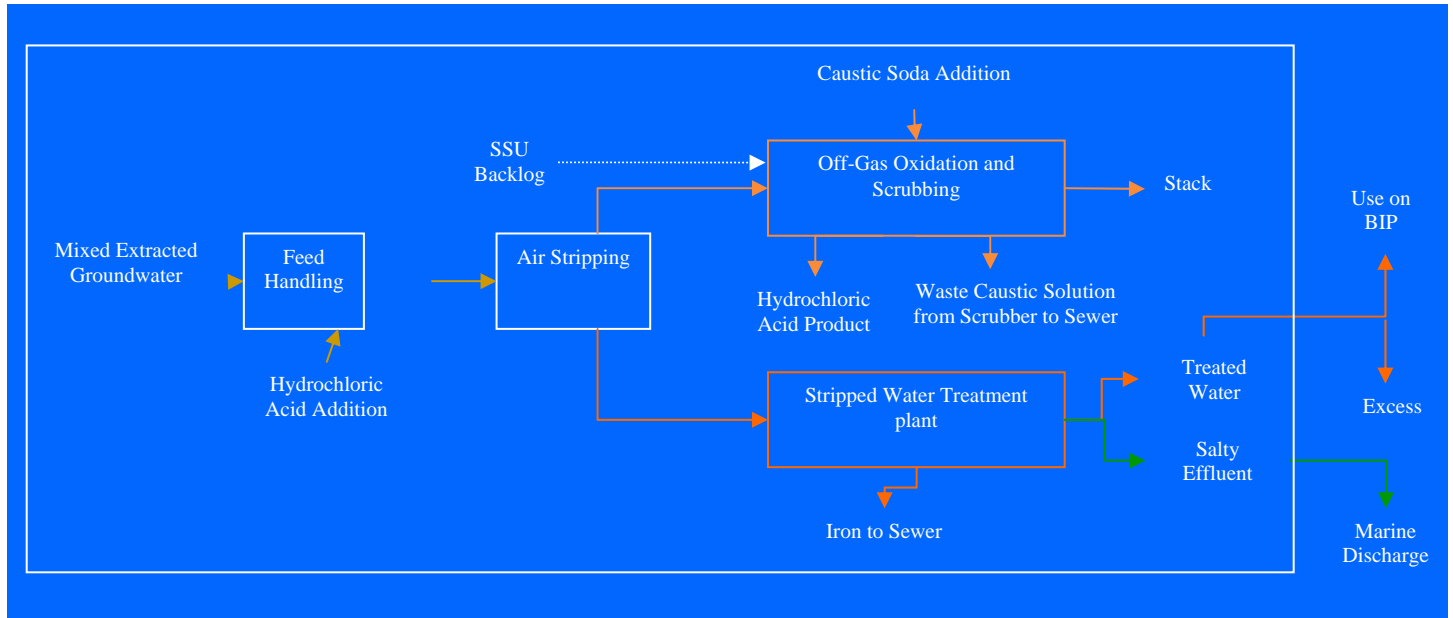


Figure 1: Air Stripping / TO flow chart

Much of the debate surrounding thermal oxidation is about the dioxins and furans that can be emitted by the thermal oxidation process. Dioxins and furans are highly toxic, persistent chemicals that can be produced by combustion processes such as thermal oxidation.

John explained that Australia (along with Europe) has some of the tightest controls in the world for the emission of dioxins – less than 0.1 ng per cubic metre (i.e., 1/10 billionth of a gram per cubic metre). Japan, on the other hand, has a range of emission controls from 0.1- 5 ng/cubic metre depending on the size of the oxidation unit. The USA does not have dioxin regulations for vapours and require less than 0.4 ng/cubic metre for the destruction of liquid and solids.

John also gave a detailed description of the different types of thermal oxidisers available, including direct quench, recuperative, flameless and regenerative. Orica is continuing to examine these different types of thermal oxidisers against international best practice standards and the operational conditions of the Groundwater Treatment Plant.

Orica is now preparing the EIS for the Groundwater Treatment Plant using air stripping coupled with thermal oxidation as our preferred technology. Important elements of the EIS process will be the independent assessment of technologies and community input. If the EIS shows that air stripping coupled with thermal oxidation does not satisfy environmental, health and hazard standards and regulations then we will need to consider other options.

Copies of the presentations made to the CLC are available on our website – www.oricabotanygroundwater.com.

For more information, please:

Call our **Community Hotline** on 1800 025 138

Visit our **website** at www.oricabotanygroundwater.com

Write to us at: **Community Matters**,
16-20 Beauchamp Road,
Matraville, 2036

Botany Groundwater Cleanup Project

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COMMUNITY INVITATION



Orica extends an invitation to members of the community and its regulatory and government stakeholders to attend the **THIRD COMMUNITY WORKSHOP** where preliminary findings of the Environmental Impact Statement for the Botany Groundwater Treatment Plant will be presented and discussed.

- Event:** **Groundwater Treatment Plant
Environmental Impact Statement
THIRD COMMUNITY WORKSHOP**
- Objective:** This third community workshop has been designed to aid the development of the Groundwater Treatment Plant Environmental Impact Statement (EIS) through community participation. This workshop aims to facilitate review and comment on the preliminary studies that have been, or are being completed as part of the EIS.
- Date:** **Wednesday 15 September 2004**
Time: 8.45am – 3.10pm
- Attendance:** **Please register your attendance with Louise Walker on 02 9352 2307 to ensure ample seating/refreshments. A workshop kit will be forwarded to you.**
- Venue:** Ground Floor, Orica Administration Building,
Cnr Beauchamp Road and Denison Street, Matraville.
Parking off Beauchamp Road.
Pedestrian entry off Denison Street
- Chair:** Chaired by Assoc. Professor Ronnie Harding, Director of the Institute of Environmental Studies at UNSW

Further information is available at www.oricabotanygroundwater.com