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| Client | Enterra Group |
| Location | Docklands, Victoria, Australia |
| ACQUA Product(s) | Inline Swirl Generator (ISG*) Solid/Liquid (SL) Hydrocyclone<br>Vertical Gravity Separator (VGS*) Oil/Water (OWS) |

## Objective

To purify contaminated groundwater without using chemicals to lower water contamination to a level whereby trade waste discharge fees are minimized. Since the water will also be used on the remediation site for dust control, health and safety requirements dictate that water quality is paramount.

## Background

For more than a century, parts of the Docklands Precinct have been used for heavy industrial uses. The West Melbourne Gasworks was used for the manufacture of coal gas, and the storage of large quantities of what are now regarded as toxic chemicals. As part of an ongoing initiative to create employment and stimulate growth through privately funded infrastructure projects, The Victorian government has now decided to redevelop the Docklands area, one of the largest joint government and private industry projects in Victoria's history. A key to the development is the construction of low, medium and high density housing, along with the necessary governmental infrastructure.

Before the West Melbourne Gasworks site can be sold to a private developer, the present owner must decontaminate the site. During its history, various governmental bodies have owned the West Melbourne Gasworks site. As such, the Victorian Government has the responsibility of cleaning up the site. They have subsequently tendered out the decontamination works. The soil is contaminated mainly with liquid hydrocarbons, but also with coal dust, BTEX and other mineral oil derivative chemicals. Enterra JV has been employed to oversee the site decontamination. They will sort and decontaminate the soil as appropriate.

## Solution

The soil decontamination process exposes vast quantities of similarly contaminated groundwater. The exposed water also needs to be decontaminated before being sent to the sewer or being sprayed on site for dust control.

Since Enterra JV is also responsible for the water discharged from the site, they have employed ACQUA to undertake the processing of the water and to ensure the discharge of clean water from the site. As most of the contamination is in the form of hydrocarbons, ACQUA have determined that hydrocyclones can be used in place of traditional chemical treatment.
Unfortunately the proximity of the site to the Yarra River allows for hydraulic stresses which lead to groundwater flows into the site. This water also becomes contaminated, and this water also needs to be treated.

The system supplied by ACQUA employs two hydrocyclones, a patented OWS VGS* and a series of retention tanks. The hydrocyclone exploits the principle of density difference for phase separation. The light phase is separated from the heavy phase by inducing centrifugal forces inside a special chamber. The patented ISG* is the heart of the system.

The first stage consists of an 8-head solid/liquid hydrocyclone. The sand and silt sucked up from the excavation pits is separated from the oily water stream prior to the second stage treatment. The oily water then passes to a second multi head hydrocyclone. This unit swirls the oily water at extremely high speed to force the oil away from the water. The oil rich phase is further concentrated using another patented technology, the OWS VGS*.

The resulting clarified water is settled for a short period before being discharged to sewer. The purity of the water is such that trade waste charges are minimized. Alternatively, the processed water may be spayed on site for dust control, thus saving on town water charges, and further reducing trade waste charges by decreasing the volume of water being sent to the sewer.