



Industrial Systems Environmental Assessment

Client
BlueScope Steel

Location
Port Kembla, NSW

BlueScope Steel - Cogeneration Plant New South Wales

CH2M HILL Australia Pty Ltd was engaged to prepare an Environmental Assessment to Modify an Existing Development Consent for the construction and operation of a cogeneration plant at the BlueScope Steel Port Kembla Steelworks under Section 75W of the Environmental Planning and Assessment Act 1979 and Clause 8(J)8 of the Environmental Planning and Assessment Regulations 2000.

Port Kembla Steelworks is the largest steel production facility in Australia. As a result of its iron and steelmaking production processes, by-product gases are generated. These gases include Coke Ovens Gas, Blast Furnace Gas and BOS Off-Gas. Gas which cannot be utilised on site is currently flared to atmosphere.

The approved cogeneration plant will generate steam and electricity for the Port Kembla Steelworks through the capture and re-use of most of the by-product gases currently flared. In addition, natural gas will be used during times of peak electricity generation or when the supply of by-product gases is interrupted.

One of the key modifications to the approved cogeneration plant is the replacement of the re-circulated fresh water cooling system with cooling towers to a once-through salt water cooling system, utilising salt water from Port Kembla Harbour and discharging it back into Allan's Creek. With water now considered a more valued and scarce resource, the modification will reduce BlueScope Steel's reliance on fresh water by up to 10 mega litres per day.

The use of a once-through salt water cooling system required an assessment of the potential impact on Port Kembla Harbour resulting from the additional heat load discharge in to Allan's Creek, macro-fouling controls including both thermal and chemical, and the potential impact on the aquatic ecology including specific studies assessing the impacts of plankton entrained into the cooling system. In addition, the potential impact on circulation patterns in Port Kembla Harbour was also considered to assess whether an impact on the current shipping movements in Port Kembla Harbour would be affected. Specialist studies were prepared to predict the temperature increase in Allan's Creek and Port Kembla Inner and Outer Harbour. Based on the modelled predictions, a specially engineered discharge device was designed to discharge the cooling water into the top third/half of Allan's Creek to facilitate maximum heat dissipation, reducing the heat load in Port Kembla Harbour and minimising the potential impact on the aquatic ecology.

As part of the environmental assessment, a greenhouse gas (GHG) impact assessment was undertaken by CH2M HILL to provide an estimate of changes in GHG emissions as a direct result of the project as modified. The GHG emissions resulting from the project as modified

was compared to current operations as well as the approved project. The significant GHG emission benefits which were estimated were to result from the production of electricity at a lower emissions intensity than existing off-site generators, resulting in significant GHG abatements.

An air quality impact assessment was also undertaken to assess the impacts associated with the project both locally and regionally. The assessment compared the existing operations (emissions from the current power generation facilities and associated flaring), with the predicted emissions from the operation of the cogeneration plant as modified (taking into consideration the decommissioning of the old power generation facilities and change in flaring) resulting in a net change in emissions associated with the project as modified.

A revised Preliminary Hazard Analysis was prepared by CH2M HILL as a result of the proposed modifications to the project, notably the change of size and location of the cogeneration plant's gas holder. The gas holder is required to collect and stabilise the flow of by-product gas to the cogeneration plant. The Preliminary Hazard Analysis evaluated the land use safety planning risks that the proposed facility imposes on surrounding land uses in accordance with the Department of Planning's guidelines. The methodology involved hazard identification, consequence analysis, frequency analysis and risk assessment.

Other environmental issues included the potential impact on terrestrial ecology, specifically the regionally present Green and Golden Bell Frog, the visual impact on local residents including consideration of reduced flaring, the relocation and resizing of the gas holder and the relocation of the high voltage substation. In addition, the management of liquid waste streams, noise and cumulative impacts were also addressed.
