

# PGM ENVIRONMENT

## MARINE ANTHROPOGENIC NOISE ASSESSMENT AND MANAGEMENT CAPABILITIES

John Polglaze of PGM Environment has significant experience with all aspects of the environmental assessment and risk analysis of in-water noise intensive activities, and the development of effective, yet practicable risk mitigation measures. He has established an international reputation within this field and is regularly invited to speak at seminars and conferences in Australia and overseas. His experience spans the full spectrum of locations from deep oceanic areas to shallow coastal embayments, and includes all anthropogenic noise sources of potential concern to regulatory authorities, including pile driving, trenching, dredging, explosive blasting, drilling, seismic survey, all forms of sonar, and vessel and aircraft movements. He has a First Class Honours Degree in Environmental Science, a Masters of Environmental Management and Development and a Graduate Certificate in Marine Sciences, and has undertaken marine acoustic propagation modelling courses with the Australian Defence Science and Technology Organisation (DSTO). He is a Certified Environmental Auditor, a Chartered Marine Scientist (CMarSci) and a Fellow of the Institute for Marine Engineering, Science and Technology (FIMarEST). He is also an inaugural Executive Member of the Cockburn Sound Management Council, with the charter of advising Government and stakeholders on sustainable, long-term multi-purpose use of the Sound, the most industrialised and heavily used embayment on the west coast of Australia. This paper presents a synopsis of a selection of marine anthropogenic noise projects within which John Polglaze has had a key role.



### **Australian National Seismic Survey Guidelines**

John Polglaze was a member of the team engaged by the Commonwealth Department of the Environment to update the *Australian National Guidelines For Interaction Between Offshore Seismic Exploration and Whales*, promulgated under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). His role included review of best practice guidelines from around the world, and assessment and analysis of the merits or otherwise of using passive acoustic measures as mitigation tools.



### **Darwin Harbour Port Development**

John Polglaze was engaged by the Northern Territory Government to advise on assessment and risk mitigation measures for pile driving in Darwin Harbour. Although regulators initially required extensive acoustic modelling and verification monitoring, PGM recognised such an approach would represent a significant waste of resources. By leveraging available information, he was able to develop and demonstrate the efficacy of effective risk mitigation measures, saving many months in planning and evaluation and avoiding excessive financial outlays.

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#### **INPEX Browse Marine Noise and Blast Assessments**

John Polglaze was the primary adviser to INPEX on in-water noise aspects of the environmental approvals process for the offshore field, pipeline route and the LNG processing facility and export facility in Darwin Harbour. This assessment was required to satisfy Northern Territory and Commonwealth regulatory authorities, particularly in relation to deemed sensitive biota including three species of protected inshore dolphins, dugongs, crocodiles and barramundi (a prized sports fish). The project encompassed pile driving, in-water blasting, dredging, and noise from ship and boat movements.



#### **Wheatstone LNG Project Marine Noise Assessment**

John Polglaze was the primary author and lead technical consultant for the marine anthropogenic noise component of the environmental assessment report for the proposed Wheatstone LNG project, in the north west region of WA. This marine noise assessment considered both coastal and offshore activities, including seismic survey, drilling, pipelaying, dredging, rock dumping, pile driving and pipeline operations.



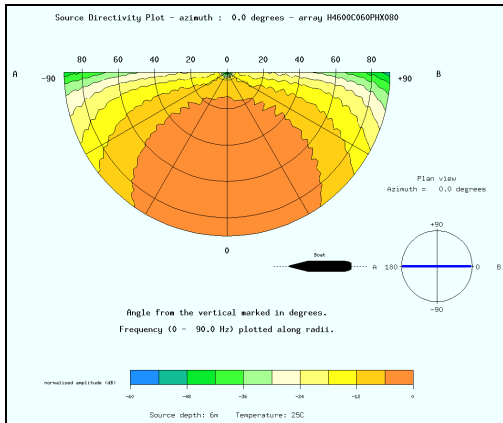
#### **Offshore Petroleum Production Activities, Abu Dhabi**

John Polglaze lead a team engaged by the Abu Dhabi National Oil Company (ADNOC) to advise on environmental risks and best practice management measures concerning noise intensive activities associated with the development of offshore oil production facilities in the Arabian Gulf. Of particular concern were dugongs and turtles which inhabited the shallow inshore areas.



#### **Scott Reef: Effects of Seismic Airguns and Other Sources of Pulsed Sound on Marine Fishes**

John Polglaze was engaged to undertake a specialist peer review and advisory role for the literature review and risk assessment component of the extensive environmental assessment performed for Woodside's (then) proposed petroleum exploration activities at Scott Reef, off WA. This project was considered to be particularly sensitive, given the protected status of Scott Reef, and was conducted in accordance with WA and Commonwealth regulatory requirements,



### Shell Seismic Survey Exploration, French Guyana

Following the submission of their acoustic propagation modelling with associated risk evaluations and proposed mitigation measures for an intended seismic survey campaign off the French territory of French Guyana, the regulator directed Shell to engage an independent specialist to review the efficacy of their evaluations and the effectiveness of the proposed management methodologies. John Polglaze was commissioned to undertake this review, on the basis that his credentials and experience with this subject matter were to the satisfaction of the French regulatory authorities.



### Marine Construction and Blasting Activities, Southern Seawater Desalination Plant, Binningup, WA

John Polglaze was engaged by the WA Water Corporation to undertake detailed analyses and risk assessments of marine construction elements of the desalination plant at Binningup. This examined noise sources including explosive blasting, pile driving, trenching and rock dumping, in an area considered important as a humpback whale migration route and with a significant population of resident dolphins in the near vicinity, and was conducted within the framework of the EPBC Act.



### WA Water Corporation Marine Construction Standard Operating Procedures

Stemming from his work at Binningup, John Polglaze was engaged by the WA Water Corporation to develop standard environmental management and risk mitigation procedures for noise-intensive coastal infrastructure development activities. These measures centred upon the laying of pipelines and outfalls, and addressed activities such as pile driving, in-water blasting, dredging, trenching and rock dumping.



### Augusta Boat Harbour Marine Noise Management Plan

A WA Government agency engaged John Polglaze to review a noise and blast assessment prepared for the development of a new marina, as well as the associated official conditions of approval. The particular element of concern related to the conduct of marine blasting in a location recognised as important as a migration route and aggregation area for a number of threatened species of great whales and other cetaceans. John was able to better focus the risk assessment, as a basis for the development of more meaningful and effective risk mitigation procedures.

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### Defence In-water Explosives Activities

John Polglaze has undertaken a range of assessments and risk evaluations concerning Defence in-water explosives training and operational activities. Many of these have focused upon Triangular Island, in Shoalwater Bay, where particular concern exists with the potential risk to sensitive species including dugongs, inshore dolphins and turtles. These have resulted in pragmatic, standard risk management procedures to the satisfaction of the Great Barrier Reef Marine Park Authority and the Commonwealth Department of the Environment, while still permitting Defence to undertake meaningful training.



### Australian Defence Force Maritime Activities EMP

John Polglaze developed the standard impact avoidance and risk mitigation measures used by the Australian Defence Force (ADF) (primarily Navy and Air Force) for the management of in-water noise intensive activities. This encompasses the use of all types of sonar, in-water explosives, gunnery and missile shoots, acoustic minesweeping, ship and boat use, and low-level flight by all types of aircraft from helicopters to supersonic combat jets. Underpinning this work were detailed environmental assessments and risk analyses to the satisfaction of the Australian national environmental regulatory authorities.



### Royal Australian Air Force Aircraft Activities EMP

Building upon the ADF Maritime Activities EMP, John Polglaze was engaged by the Royal Australian Air Force (RAAF) to develop a comprehensive package of standard risk management measures for all Air Force aviation activities. This included measures for the full range of noise-intensive flying activities over both land and sea and the use of all RAAF in-water weapons and sensors (e.g. sonobuoys).



### Air Warfare Destroyer Integrated Sonar Suite Environmental Risk Review

John Polglaze evaluated all aspects of environmental risk pertaining to the sonar suite for the Royal Australian Navy's (RAN) new high capability Air Warfare Destroyers. This assessment was conducted in accordance with the requirements of the EPBC Act and included the development of a suite of practicable risk mitigation measures.

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#### **FNACS Environmental Risk Review, including Sonar**

John Polglaze was engaged by the Department of Defence to undertake an environmental assessment of the helicopters and associated systems shortlisted to fulfil the RAN's Future Naval Aviation Combat System (FNACS). This included all in-water noise intensive facets associated with the new helicopters, including low-level flight and hover over water, the use of the dipping sonar and sonobuoys, and weapons systems including torpedoes.



#### **Defence Activities in the Great Barrier Reef World Heritage Area**

John Polglaze undertook a strategic assessment of all Defence activities (Navy, Army and Air Force) conducted within the Great Barrier Reef Marine Park and World Heritage Area in 2005, and again in 2013. These projects were undertaken in close collaboration with and to the satisfaction of the Great Barrier Reef Marine Park Authority. These included, *inter alia*, all in-water noise intensive activities conducted by Defence, such as the use of all sonars, in-water explosives and low level aircraft flight.



#### **Defence Activities in the Jervis Bay Marine Park**

John Polglaze undertook an environmental assessment and risk review of all Defence activities (Navy, Army and Air Force) conducted within the Jervis Bay Marine Park. This examination specifically included the use of Navy minehunting sonar within the Bay, an area considered especially sensitive given its protected status, its periodic use by migrating whales and the large resident dolphin population which supports a number of locally significant dolphin watching businesses.



#### **Miscellaneous Defence Assessments**

John Polglaze is regularly engaged by the Department of Defence to advise on aspects of the environmental assessment, risk evaluation and management of in-water noise intensive systems and activities. These have included issues related to ship mounted sonar systems, diver-operated sonar systems, sonobuoys, helicopter dipping sonars, in-water explosives training, aircraft noise (fast jets, helicopters, pilotless target aircraft), torpedo firings and ship-target weapons firings exercises.



### **Presentations and Conferences**

John Polglaze is recognised both nationally and internationally for his work on the environmental assessment and management of marine anthropogenic noise. He has spoken on this subject, often by invitation, in Australia, the United States, Italy, Denmark, Ireland, Latvia and the Netherlands. He is a regular invitee to NATO seminars on this subject (even though Australia is not a member of NATO), and also speaks at various industrial conferences and seminars.

(Image credits: ABC, CME WA, Defence, Dempsey, WA DoT, DSEWPaC, Lockheed Martin, The National, Navantia, PPO, Shell, The Warren Centre, Water Active)

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