



# References

## Invitation to Comment

ChevronTexaco Australia 2004. *Guidelines for an Environmental Impact Statement and Environmental Scoping Document for an Environmental Review and Management Programme for the Proposed Gorgon Development*. Gorgon Australian Gas, Perth, Western Australia. This document is available from the Gorgon Development's website (<http://www.gorgon.com.au>).

## Chapter 1

AS/NZS 4360: 2004. *Risk Management*. Jointly published by Standards Australia International Ltd, Sydney, NSW, and Standards New Zealand, Wellington, NZ.

ChevronTexaco Australia 2004. *Guidelines for an Environmental Impact Statement and Environmental Scoping Document for an Environmental Review and Management Programme for the Proposed Gorgon Development*. Gorgon Australian Gas, Perth, Western Australia. This document is available from the Gorgon Development's website (<http://www.gorgon.com.au>).

ChevronTexaco Australia. 2003. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.

ChevronTexaco. 2004. *Draft Guidance for Performing an Environmental Impact Assessment*. Energy Technology Company – Environmental Unit, Richmond, CA, USA.

Conservation Commission of Western Australia. 2003. *Biodiversity Conservation Values on Barrow Island Nature Reserve and the Gorgon Gas Development – Advice to the Government from the Conservation Commission of Western Australia*. Conservation Commission of Western Australia, Crawley, WA.

Department of Industry and Resources (WA). 2003. *Western Australian Oil and Gas Industry*. Available at: [www.doir.wa.gov.au/documents/investment/OilGasReview.pdf](http://www.doir.wa.gov.au/documents/investment/OilGasReview.pdf) [accessed: 26 April 2005].

Department of Local Government and Regional Development. 2003. *Indicators of Regional Development in Western Australia*. Prepared by URS Australia. Available at: [www.dlgrd.wa.gov.au/pub/docs/Regional/wholeDoc.pdf](http://www.dlgrd.wa.gov.au/pub/docs/Regional/wholeDoc.pdf) [accessed: 23 August 2004].

Environmental Protection Authority (EPA) (WA). 2003. *Guidance for the Assessment of Environmental Factors – Implementing Best Practice in Proposals Submitted to the Environment Impact Assessment Process*. Draft Guidance Statement No. 55. Environmental Protection Authority, Perth, WA.

Environmental Protection Authority (EPA) (WA). 2004a. *Principles of Environmental Protection*. Guidance Statement No. 7. Environmental Protection Authority, Perth, WA.

Environmental Protection Authority (EPA) (WA). 2004b. *Preliminary Position Statement: Environmental Offsets*, July 2004. Available at: [www.epa.wa.gov.au/docs/1863\\_Offsets%20PS9.pdf](http://www.epa.wa.gov.au/docs/1863_Offsets%20PS9.pdf) [accessed: 1 April 2005].

Safety and Quality Council. 2001. *Online Glossary*. Available at: [www.safetyandquality.org/definition/smalphabetical.htm](http://www.safetyandquality.org/definition/smalphabetical.htm) [accessed: 10 December 2004].

World Commission on Environment and Development (WCED). 1987. *Our Common Future* (The Brundtland Report). Oxford University Press, Oxford, UK.

## Chapter 2

Allen Consulting Group (The). 2003. *Proposed Access to Barrow Island for Gas Development*. Report to the Western Australian Department of Industry and Resources, Perth, WA.

Brown, C. 2003. *Western Australia, Legislative Assembly 2003, Questions and Speeches*. Hansard pp. 8892–8893 (18 June). Available at: [www.parliament.wa.gov.au](http://www.parliament.wa.gov.au) [accessed: 20 Aug 2004].

ChevronTexaco Australia. 2003. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.

Environmental Protection Authority (EPA) (WA). 2003. *Environmental Advice on the Principle of Locating a Gas Processing Complex on Barrow Island Nature Reserve*. Section 16 Report and Recommendations of the Environmental Protection Authority, Bulletin 1101. EPA, Perth, WA.

Government of Western Australia. 2003a. *Consideration of Access to Barrow Island for Gas Development: Advice for Government's Environmental, Social, Economic and Strategic Deliberations*. Information Pack. Available at: [www.doir.wa.gov.au](http://www.doir.wa.gov.au) [accessed: 20 May 2004].

Government of Western Australia. 2003b. *State Government Grants In-principle Approval for the Development of Australia's Largest Gas Reserve*. Media Release. Premier's Office and Office of Minister for State Development (WA). Available at: [www.regional.mediastatements.wa.gov.au](http://www.regional.mediastatements.wa.gov.au) [accessed: 20 May 2004].

### Chapter 3

- Allen Consulting Group (The). 2003. *Proposed Access to Barrow Island for Gas Development*. Report to the Western Australian Department of Industry and Resources, Perth, WA.
- ChevronTexaco Australia. 2003. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.
- Department of Conservation and Land Management (CALM). 2004. *Indicative Management Plan for the Proposed Montebello/Barrow Island Marine Conservation Reserves*. Department of Conservation and Land Management, Perth, WA.
- Last, P.R. and Stevens, J.D. 1994. *Sharks and Rays of Australia*. CSIRO, Melbourne, Vic.
- Western Radiation Services. 2002. *Radiation Levels at the Montebello Islands*. Report to ChevronTexaco Australia, Perth, WA.

### Chapter 4

- ChevronTexaco Australia 2004. *Guidelines for an Environmental Impact Statement and Environmental Scoping Document for an Environmental Review and Management Programme for the Proposed Gorgon Development*. Gorgon Australian Gas, Perth, Western Australia. This document is available from the Gorgon Development's website (<http://www.gorgon.com.au>).

### Chapter 5

- ChevronTexaco Australia. 2003a. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island – Response to Submissions*. Prepared for the Department of Industry and Resources. Gorgon Australian Gas, Perth, WA.
- ChevronTexaco Australia. 2003b. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.
- Department of Environment (WA). 2003. *Interim Industry Guide to Community Involvement*. Available at: [www.environ.wa.gov.au/downloads/2569\\_CI\\_Guidelines.pdf](http://www.environ.wa.gov.au/downloads/2569_CI_Guidelines.pdf) [accessed: 8 Feb 2005].

### Chapter 6

- AS 1940:2004. *Storage and Handling of Flammable and Combustible Liquids*. Standards Australia, Sydney, NSW.
- AS 2885.1:1997. *Pipelines – Gas and Liquid Petroleum*. Standards Australia, Homebush, NSW.
- ANZECC/ARMCANZ. 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality: Vol. 1, The Guidelines*. Australia and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand. Canberra, ACT.
- Australian Institute of Petroleum (AIP). 2002. *Code of Practice CP 04 – The Design, Installation and Operation of Underground Petroleum Storage Systems*. Available at: [http://ecom.aip.com.au/index.php?action=add&pub\\_id=10&rel\\_id=9&t=publist](http://ecom.aip.com.au/index.php?action=add&pub_id=10&rel_id=9&t=publist) [accessed: 7 June 2005].
- Australian Institute of Petroleum (AIP). 1994. *Code of Practice CP 25 – Wastewater Management at Bulk Petroleum Storage Sites*. Available at: [http://ecom.aip.com.au/index.php?action=add&pub\\_id=10&rel\\_id=9&t=publist](http://ecom.aip.com.au/index.php?action=add&pub_id=10&rel_id=9&t=publist) [accessed: 7 June 2005].
- British Standard EN1473. 1997. *Installation and Equipment for Liquefied Natural Gas – Design of Onshore Installations*. Available at: [www.bsonline.bsi-global.com/search/item/1407375](http://www.bsonline.bsi-global.com/search/item/1407375) [accessed: 7 June 2005].

### Chapter 7

- AS ISO 1999:2003. *Acoustics: Determination of Occupational Noise Exposure and Estimation of Noise-induced Hearing Impairment*. Standards Australia, Sydney, NSW.
- AS 2885.1:1997. *Pipelines – Gas and Liquid Petroleum*. Standards Australia, Homebush, NSW.
- Civil Aviation Safety Authority (CASA). 2003. *Draft Advisory Circular AC 139–05(0). Guidelines for Plume Rise Assessments*. Available at: [http://rrp.casa.gov.au/drafts/draftac139-05\\_v0.pdf](http://rrp.casa.gov.au/drafts/draftac139-05_v0.pdf) [accessed: 19 Nov 2004].
- ChevronTexaco Australia. 2003a. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.
- ChevronTexaco Australia. 2003b. *Barrow Island Annual Environmental Report, 2003*. Internal Report, ChevronTexaco Australia, Perth, WA.

- Det Norske Veritas. 2000. *Offshore Submarine Systems. Offshore Standard DNV-OS-F101*. Available at: [http://exchange.dnv.com/BxWmWeb/TaskManager.asp?WCI=MenuArea&WCE=PMA\\_6\\_812!814&uid=ID2005060721890346117](http://exchange.dnv.com/BxWmWeb/TaskManager.asp?WCI=MenuArea&WCE=PMA_6_812!814&uid=ID2005060721890346117) [accessed: 7 June 2005].
- Encyclopedia. 2005. <http://encyclopedia.laborlawtalk.com/Lux> [accessed: 31 May 2005].
- Environmental Protection Agency (EPA) (SA). 2001. *Information Sheet No. 22 'Acid Rain'*. Environmental Protection Agency, Adelaide, SA.
- Environmental Protection Agency (EPA) (Vic) 2001. *State Environment Protection Policy (Air Quality Management)*. No. S240, Gazette 21/12/2001. Available at: [www.epa.vic.gov.au/Publications/Legislation/sepps.asp#air](http://www.epa.vic.gov.au/Publications/Legislation/sepps.asp#air) [accessed: 25 August 2004].
- Environmental Protection Authority (EPA) (WA). 1999a. *Developing a State-wide Air Quality Environmental Protection Policy. Concept Discussion Paper for Public Comment*. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (EPA) (WA). 1999b. *Emissions of Oxides of Nitrogen from Gas Turbines*. Guidance for the Assessment of Environmental Factors. No 15. Preliminary Guidance. Environmental Protection Authority, Perth, WA.
- French, D. 2000. Estimation of Oil Toxicity Using an Additive Toxicity Model. *In: Proceedings of the 23rd Arctic and Marine Oil Spill Program (AMOP) Technical Seminar*. Vancouver, BC, Canada.
- French, D., Schuttenberg, H. and Isaji, T. 1999. Probabilities of Oil Exceeding Thresholds of Concern: Examples of an Evaluation for Florida Power and Light. *In: Proceedings of the 22nd Arctic and Marine Oil Spill Program (AMOP) Technical Seminar*, pp. 243–270. Calgary, Alberta, Canada.
- Furlani, D.M. 1996. *A Guide to Introduced Marine Species in Australian Waters*. Centre for Research on Introduced Marine Pests (Australia). CSIRO Technical Report No. 5, CSIRO Division of Fisheries, Hobart, Tas. Available at: [www.rpd.c.tas.gov.au/soer/source/37/index.php](http://www.rpd.c.tas.gov.au/soer/source/37/index.php) [accessed: 23 Nov 2004].
- Hewitt, C.L., Martin, R.B., Sliwa, C., McEnnulty, F.R., Murphy, N.E., Jones T. and Cooper, S. (eds.) 2002. *National Introduced Marine Pest Information System*. Available at: <http://crimp.marine.csiro.au/nimpis> [accessed: 14 September 2004].
- International Association of Oil and Gas Producers. 2003. *Environmental Aspects of the Use and Disposal of Non-aqueous Drilling Fluids Associated with Offshore Oil and Gas Operations*. Report No. 342. Available at: <http://www.ogp.org.uk/pubs/342.pdf> [accessed: 22 September 2004].
- McCauley, R.D., Fewtrell, J., Duncan, A.J., Jenner, C., Jenner, M.N., Penrose, J.D., Prince, R.I.T., Adhitya, A., Murdoch, J. and McCabe, K. 2000. Marine Seismic Surveys – A Study of Environmental Implications. *APPEA Journal*: 692–708.
- McCauley, R.D., Jenner, M., Jenner, C., McCabe, K. and Murdoch, J. 1998. The Response of Humpback Whales (*Megaptera novaeangliae*) to Offshore Seismic Survey: Preliminary Results of Observations about a Working Seismic Vessel and Experimental Exposures. *APPEA Journal*: 692–706.
- McCauley, R.D. 1998. *Radiated Underwater Noise Measured from the Drilling Rig, Ocean General, Rig Renders, Pacific Arki and Pacific Frontier, Fishing Vessel, Reef Venture, and Natural Sources in the Timor Sea*. Report to Shell Australia.
- McCauley, R.D. 2002. *Underwater Noise Generated by Cossack Pioneer FPSO and its Translation to the Proposed Vincent Petroleum Field*. Report prepared for Woodside Energy Ltd. Centre for Marine Science and Technology, Curtin University, Perth, WA.
- McCauley, R.D., Fewtrell, J. and Popper, A.N. 2003. High Intensity Anthropogenic Sound Damages Fish Ears. *Journal of the Acoustical Society of America*, 113(1): 638–642.
- MScience. 2005. *Corals of the Dampier Harbour: Their Survival and Reproduction During the Dredging Programs of 2004*. Published by MScience on behalf of Dampier Port Authority and Pilbara Iron, Nedlands, WA.
- National Environment Protection Council (NEPC). 1998. *Measures for Ambient Air Quality*. National Environment Protection Council Service Corporation, Adelaide, SA.
- National Environment Protection Council (NEPC). 2004. *National Environment Protection Measure for Air Toxics (NEPM): Explanatory Document*. Available at: [www.ephc.gov.au/pdf/Air\\_Toxics/FinalAirToxicsNEPM.pdf](http://www.ephc.gov.au/pdf/Air_Toxics/FinalAirToxicsNEPM.pdf) [accessed: 7 June 2005].
- National Introduced Marine Pest Information System. 2002 (see Hewitt, C.L. et al. 2002 above).
- Richardson, W.J., C.R. Greene, Jr., C.I. Malme, and Thomson, D.H. 1991. *Effects of Noise on Marine Mammals*. OCS Study MMS-90-0093; LGL Rep. TA834-1. Report from LGL Ecological Research Associates Inc. for US Minerals Management Service, Atlantic OCS Reg., Herndon, Virginia, USA. 462 pp.

- Richardson, W.J., Greene Jr, C.R., Malme, C.I. and Thomson, D.H. 1995. *Marine Mammals and Noise*. Academic Press, San Diego, California, USA. 576 pp.
- Sakhalin Energy. 2003. *Western Gray Whale Environmental Impact Assessment*. Available at: [www.sakhalinenergy.com/documents/doc\\_33\\_eia\\_chp5.pdf](http://www.sakhalinenergy.com/documents/doc_33_eia_chp5.pdf) [accessed: 7 June 2005].
- URS. 2004. *Draft Review of DEH Guidelines on the Application of the EPBC Act to Interactions between Offshore Seismic Operations and Larger Cetaceans. Technical Report Appendix A*. Available at: [www.deh.gov.au/epbc/assessmentsapprovals/guidelines/pubs/draft-seismic-cetacean-report.pdf](http://www.deh.gov.au/epbc/assessmentsapprovals/guidelines/pubs/draft-seismic-cetacean-report.pdf) [accessed: 7 June 2005]
- US Environmental Protection Authority (USEPA). 2004. *National Ambient Air Quality Standards (NAAQS)*. Available at: <http://epa.gov/air/criteria.html> [accessed: 17 June 2004].
- US Environmental Protection Agency (USEPA). 1999. *Environmental Assessment of Proposed Effluent Limitations Guidelines and Standards for Synthetic-Based Drilling Fluids and other Non-Aqueous Drilling Fluids in the Oil and Gas Extraction Point Source Category*. EPA Number: 821B98019.
- Witherington, B.E., and Martin, R.E. 1996. *Understanding, Assessing and Resolving Light Pollution Problems on Sea Turtle Nesting Beaches*. Florida Marine Research Institute Technical Report. Florida Marine Research Institute, St. Petersburg, Florida, USA.
- Woodside Energy. 2003. *WA-271-P Field Development Draft Environmental Impact Statement*. Woodside Energy Ltd., Perth, WA.
- Woodside Energy. 2005. *Woodside Health, Safety and Environmental Report 2004*. Woodside Energy Ltd., Perth, WA.
- World Health Organisation. 2000. *Air Quality Guidelines for Europe, Second Edition*. World Health Organisation Regional Publications, European Series, Number 91. Available at: [www.who.int/bookorders/anglais/detart1.jsp?sesslan=1&codlan=1&codcol=31&codcch=91](http://www.who.int/bookorders/anglais/detart1.jsp?sesslan=1&codlan=1&codcol=31&codcch=91) [accessed: 7 June 2005].
- ## Chapter 8
- Aplin, K. P. 1998. Three New Blindsnakes (Squamata, Typhlopidae) from North Western Australia. *Records of the Western Australian Museum*, 19: 1–12.
- Astron Environmental. 2002. Preliminary Vegetation and Flora Survey of Proposed Gorgon Development Barrow Island, October 2002. Report prepared for Gorgon Joint Venture, Perth, WA.
- Baker, A.N. 1990. *Whales and Dolphins of Australia and New Zealand. An Identification Guide*. Allen and Unwin, Sydney, NSW.
- Bamford, M., Watkins, D., Bancroft, W., Tischler, G., and Wahl, J. in press. *Migratory Shorebirds of the East Asian–Australasian Flyway; Population Estimates and Important Sites*. Wetlands International Oceania, Canberra, ACT.
- Beard, J.S. 1980. A New Phytogeographic Map of Western Australia. *Western Australian Herbarium Notes*, No. 3: 37–58.
- Beard, J.S. 1990. *Plant Life of Western Australia*. Kangaroo Press, Kenthurst, NSW.
- Biota Environmental Sciences and DC Blandford and Associates. 2004. *Preliminary Assessment of Subterranean Fauna Habitat for the Proposed Gorgon Gas Plant, Barrow Island*. Unpublished report prepared for the Gorgon Development, Chevron Texaco Australia, Perth, WA.
- Birds Australia. 2004. *Bird Atlas*. Available at: <http://www2.abc.net.au/birds/mapviewer.html> [accessed: November 2004].
- Bowman Bishaw and Gorham. 1991. Cited in: Western Mining Corporation. East Spar Offshore Gas/Condensate Proposal. Consultative Environmental Review. March 1995, Perth, WA.
- Bowman Bishaw Gorham. 1996. Barrow Island Intertidal Survey: 1995. Unpublished report RI5164 to West Australian Petroleum (WAPET), Perth, WA.
- Bradbury, J. H. and Williams, W.D. 1996a. Two New Species of Anchialine Amphipods from Barrow Island, Western Australia. *Records of the Western Australian Museum*, 1995: 395–409.
- Bradbury, J.H. and Williams, W.D. 1996b. Freshwater Amphipods from Barrow Island, Western Australia. *Records of the Australian Museum*, 48: 33–74.
- Buckley, R.C. 1983. The Flora and Vegetation of Barrow Island, Western Australia. *Journal of the Royal Society of Western Australia*, 66: 3.
- Burbidge, A., Drew, M., Pearson, D. and Kendrick, P. 2003. *Mammal Monitoring Barrow Island Nature Reserve October 2003*. Unpublished report, Department of Conservation and Land Management (CALM), Perth, WA.

- Burbidge, A. 2004. *Threatened Animals of Western Australia*. Department of Conservation and Land Management, Kensington, WA.
- Bureau of Meteorology. 2004. *Climate Averages for Barrow Island*. Available at: [www.bom.wa.gov.au/climate/averages/tables/cw\\_005058.shtml](http://www.bom.wa.gov.au/climate/averages/tables/cw_005058.shtml) [accessed: March 2004].
- Bureau of Transportation and Regional Economics. 2003. *Information Paper 48 Australian Sea Freight, 2001–2002*. Bureau of Transportation and Regional Economics, Canberra, ACT.
- ChevronTexaco Australia. 2000. *March 2000 Routine Groundwater Monitoring and Contaminated Sites Management Progress Report – ChevronTexaco Operation Area – Barrow Island, Western Australia*. ChevronTexaco Australia, Perth, WA.
- ChevronTexaco Australia. 2003a. *Gorgon Development Summary Metocean Data Book*. ChevronTexaco Australia, Perth, WA.
- ChevronTexaco Australia. 2003b. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. ChevronTexaco Australia, Perth, WA.
- Commonwealth Department of Transport and Regional Services. 2001. *Stronger Regions, A Stronger Australia*. Regional Policy Statement. Commonwealth Department of Transport and Regional Services, Canberra, ACT.
- Dames and Moore. 1990. *Consultative Environmental Review. Harriet Gas Project*. Prepared for Hadson Energy Ltd.
- Dames and Moore. 1996. *Gorgon LNG Preliminary Geotechnical Site Evaluation Exmouth and Barrow Island – Final Factual Report*. Unpublished report for West Australian Petroleum Pty Ltd., Perth, WA.
- Dames and Moore. 1998. *Second Sales Gas Pipeline Environmental Assessment and Management Document*. Unpublished report to Apache Energy, February 1998.
- Department of Conservation and Land Management (CALM). 2004. *Indicative Management Plan for the Proposed Montebello/Barrow Islands Marine Conservation Reserves*. Department of Conservation and Land Management, Perth, WA.
- Department of Fisheries. 2003. *Annual Report to Parliament 2002/2003*. Department of Fisheries, Perth, WA.
- Department of Industry and Resources. 2003. *2002/2003 Resource Sector Summary Report*. Department of Industry and Resources, Perth, WA.
- Department of Local Government and Regional Development. 2003a. *Regional Western Australia – A Better Place to Live*. Regional Development Policy, Department of Local Government and Regional Development, Perth, WA.
- Department of Local Government and Regional Development. 2003b. *Regional Trends and Indicators: Pilbara Region*. Department of Local Government and Regional Development, Perth, WA.
- Environment Australia. 2002. *Recovery Plan for the Grey Nurse Shark (Carcharias taurus) in Australia*. Environment Australia, Canberra, ACT.
- Environment Australia. 2003. *Recovery Plan for Marine Turtles in Australia*. Wildlife Conservation Branch, Canberra, ACT.
- Environmental Protection Authority (EPA) (WA). 2001. *Guidance Statement for Protection of Tropical Arid Zone Mangroves Along the Pilbara Coastline – No. 1*. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (EPA) (WA). 2003. *Consideration of Subterranean Fauna in Groundwater and Caves During Environmental Impact Assessment in Western Australia – Guidance No. 54*. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (EPA) (WA). 2004a. *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia – Guidance No. 56*. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (EPA) (WA). 2004b. *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia – Guidance No. 51*. Environmental Protection Authority, Perth, WA.
- Heithaus, M.R., McLash, J.J., Alejandro, F., Dill, L.M. and Marshall, G.J. 2002. Novel insights into green sea turtle behaviour using animal-borne video cameras. *Journal of the Marine Biological Association of the UK*, 82: 1049–1050.
- HGM. 2000. *Iron Ore Mine and Downstream Processing, Cape Preston, Western Australia Public Environmental Review*. Prepared for Austeel Pty Ltd.
- Hoffman, R.L. 1994. Studies on Spiroboloid Millipedes XVIII: *Speleostrophus nesiotus*, the first known troglobitic spiroboloid millipede from Barrow Island, Western Australia (Diplopoda, Pachybolidae, Trigoniuinae). *Myriapodologia*, 3: 19–24.
- Humphreys, W.F. in press. The Subterranean Fauna of Barrow Island (North-western Australia). *Memoires de Biospeologie (International Journal of Subterranean Biology)*, 28: 001.

- Humphreys, W.F. 2000. The Hypogean Fauna of Cape Range Peninsula and Barrow Island, North-western Australia. In: Wilkens, H., Culver, D.C., Humphreys, W.F., eds. *Ecosystems of the World, Vol. 30: Subterranean Ecosystems*. Elsevier, Amsterdam, pp. 581–602.
- Humphreys, W.F. 2001. *Milyeringa veritas* (Eleotridae), a Remarkably Versatile Cave Fish from the Arid Tropics of North-western Australia. *Environmental Biology of Fishes*, 62: 291–313.
- Jenner, K.C.S., Jenner, M.N.M., and McCabe, K.A. 2001. Geographical and Temporal Movements of Humpback Whales in Western Australian Waters. *Australian Petroleum Production and Exploration Association Journal*, 2001: 749.
- Kinhill. 1999. *East Spar Benthic Survey: 1998 Biological Monitoring Programme – Annual Report*. Unpublished report to Apache Energy Ltd. Perth, WA.
- Last, P.R. and Stevens, J.D. 1994. *Sharks and Rays of Australia*. CSIRO, Melbourne, Vic.
- LeProvost Environmental Consultants. 1992. *Permit Area TP/3 Part 1 Five Year Drilling Programme: Report on Prospect Sites and Coastal Survey*. Unpublished report to West Australian Petroleum Pty Ltd (WAPET), Perth, WA.
- Long, B. and Poiner, I. 1994. Infaunal Benthic Community Structure and Function in the Gulf of Carpentaria. *Australian Journal of Marine and Freshwater Research*, 45: 293–316.
- Mattiske, E.M. and Associates. 1993a. *Assessment of Revegetation on Seismic Lines, Barrow Island. Parts A and B*. Unpublished report prepared for West Australian Petroleum Pty Limited (WAPET), Perth, WA.
- Mattiske, E.M. and Associates. 1993b. *Flora and Vegetation Barrow Island*. Unpublished Report prepared for West Australian Petroleum Pty Limited (WAPET), Perth, WA.
- Mattiske Consulting Pty Ltd. 1997. *1996 Assessment of Revegetation on Seismic Lines, Barrow Island*. Unpublished report prepared for West Australian Petroleum Pty Limited (WAPET), Perth, WA.
- McKenzie, N.L., Morris, K.D. and Dickman, C.R. 1995. Golden Bandicoot *Isodon auratus*. In: R. Strahan, ed. *The Mammals of Australia*. Reed Books, Chatswood, NSW. pp. 172–173.
- Parmenter, J. 1994. Species Review: The Flatback Turtle – *Natator depressa*. In: R. James, ed. *Proceedings of the Australian Marine Turtle Conservation Workshop*. Queensland Department of Environment and Heritage and Australian Nature Conservation Agency.
- Payne, A.L., Van Vreeswyk, A.M.E., Pringle, H.J.R., Leighton, K.A. and Hennig, P. 1998. *An Inventory and Condition Survey of the Sandstone–Yalgoo–Paynes Find Area, Western Australia*. Technical Bulletin No. 90. Agriculture Western Australia.
- Pendoley, K. 1997. Sea Turtles and Management of Marine Seismic Programs in Western Australia. *PESA Journal*, 25: 8–16.
- Pilbara Development Commission. 2003. *Pilbara Regional Priority Plan*. Compiled for Cabinet Standing Committee on Regional Policy. Pilbara Development Commission. Karratha, WA.
- Prince, R.I.T. 1986. *Dugong in Northern Waters of Western Australia – 1984*. Technical Report No. 7. Department of Conservation and Land Management, Perth, WA.
- Prince, R.I.T. 1990. Status of the Western Australian Marine Turtle Populations: The Western Australian Marine Turtle Project 1986–1990. In: R. James, ed. *Proceedings of the Australian Marine Turtle Conservation Workshop, Gold Coast 14–17 November 1990*. Australian Nature Conservation Agency, Canberra, ACT. pp. 1–14.
- Prince, R.I.T. 2001. *Aerial Survey of the Distribution and Abundance of Dugongs and Associated Macrovertebrate Fauna – Pilbara Coastal and Offshore Region, WA, Completion Report*. Unpublished Report to the Marine Species Protection Program, Environment Australia, by the Department of Conservation and Land Management, WA.
- Pruett–Jones, S.G., and O’Donnell, E. in prep. *Land Birds on Barrow Island: Status, Population Estimates and Responses to an Oilfield Development*. Unpublished manuscript.
- Pruett–Jones, S.G. and Tarvin, K.A. 2001. Aspects of the Ecology and Behaviour of White-winged Fairy Wrens on Barrow Island. *Emu*, 101(1): 73–78.
- Shire of Ashburton Town Planning Scheme No. 7 (gazetted December 2004).
- Shire of Roebourne Town Planning Scheme No. 8 (gazetted August 2000).
- Short, J., Turner, B. and Cale, P. 1988. *The Distribution and Relative Abundance of Rare Macropods and Bandicoots on Barrow and Dorre Islands*. Report to National Kangaroo Monitoring Unit, Australian National Parks and Wildlife Service, Canberra, ACT and CSIRO, Perth, WA.

- Storr, G.M., Smith, L.A. and Johnstone, R.E. 1986. *Snakes of Western Australia*. Western Australian Museum, Perth, WA.
- Strahan, R. 1995. *The Mammals of Australia*. Reed Newholland, Sydney, NSW.
- Strayer, D.L. 1994. Limits to Biological Distribution in Groundwater. In: J. Gilbert., D.L. Danielopol, and J.A. Stanford. eds. *Groundwater Ecology*. Academic Press, California, USA.
- Sustainability Policy Unit. 2003. *Hope for the Future: The Western Australia State Sustainability Strategy*. Department of the Premier and Cabinet, Perth, WA.
- Trudgen, M.E. 1989. *A Report on the Progress of the Regeneration of Vegetation on Areas Disturbed During Oil Production on Barrow Island*. Unpublished report prepared by Malcolm Trudgen for West Australian Petroleum Pty Limited (WAPET), Perth, WA.
- URS. 2002. *Geotechnical Review of Onshore and Nearshore Areas of Barrow Island, Western Australia*. Unpublished report prepared for ChevronTexaco Australia, Perth, WA.
- Western Australian Greenhouse Task Force. 2004. *Western Australian Greenhouse Strategy*. Department of Premier and Cabinet, Perth, WA.
- Western Australian Planning Commission. 1997. *State Planning Strategy – Final Report 1997*. Western Australian Planning Commission, Perth, WA.
- Western Australian Planning Commission. 1998. *Karratha Area Development Strategy*. Western Australian Planning Commission, Perth, WA.
- West Australian Petroleum Pty Ltd (WAPET). 1989. *Barrow Island Oilfield Environmental Review 1963–1988*. Internal report. Perth, WA.
- Worley. 2003. *Gorgon Metocean Modelling. Report on Nearshore Wave, Circulation and Dispersion Modelling*. Prepared for ChevronTexaco Australia, Perth, WA.
- Worley. 2004. *Gorgon Development Environmental Site Conditions – Downstream*. Unpublished Report to ChevronTexaco Australia, Perth, WA.

## Chapter 9

- AS/NZS 4360:2004. *Risk Management*. Jointly published by Standards Australia International Ltd, Sydney, NSW, and Standards New Zealand, Wellington, NZ.
- AS/NZS 3931:1998. *Risk Analysis of Technological Systems – Application Guide*. Jointly published by Standards Australia International Ltd, Sydney, NSW, and Standards New Zealand, Wellington, NZ.
- SAA Handbook 203:2004. *Environmental Risk Management – Principles and Process*. Jointly published by Standards Australia International Ltd, Sydney, NSW, and Standards New Zealand, Wellington, NZ.
- SAA Handbook 436:2004. *Risk Management Guidelines – Companion to AS/NZS 436:2004*. Jointly published by Standards Australia International Ltd, Sydney, NSW, and Standards New Zealand, Wellington, NZ.
- United Nations Environment Programme (UNEP). 1992. *Rio Declaration on Environment and Development*. United Nations Conference on Environment and Development, Rio de Janeiro, Brazil.
- US Environmental Protection Agency (USEPA). 1998. *Guidelines for Ecological Risk Assessment*. USEPA, Washington, DC, USA.

## Chapter 10

- AEC/NHMRC. 1985. *National Guidelines for the Control of Emissions of Air Pollutants from New Stationary Sources*. Australian Government Publishing Service, Canberra, ACT.
- AS 2436–1981. *Guide to Noise Control on Construction, Maintenance and Demolition Sites, Committee AV–006*. Standards Australia, Homebush, NSW.
- AS 2885.1:1997. *Pipelines – Gas and liquid Petroleum Part 1: Design and Construction*. Standards Australia International, Sydney, NSW.
- AS 2885.3:2001. *Pipelines – Gas and Liquid Petroleum Part 3: Operation and Maintenance*. Standards Australia International, Sydney, NSW.
- Biota Environmental Sciences and DC Blandford & Associates. 2004. *Preliminary Assessment of Subterranean Fauna Habitat for the Proposed Gorgon Gas Plant, Barrow Island*. Unpublished report prepared for the Gorgon Development, Chevron Texaco, Perth, WA.

- Burbidge, A.A. 2004. *Threatened Animals of Western Australia*. Western Australian Department of Conservation and Land Management, Perth, WA.
- CALM. 2005. *Burrowing Bettong (Boodie) – Species Profile*. Department of Conservation and Land Management. Available at: [www.calm.wa.gov.au/plants\\_animals/pdf\\_files/sp\\_boodie.pdf](http://www.calm.wa.gov.au/plants_animals/pdf_files/sp_boodie.pdf) [accessed: April 2005].
- Casson, N. 2003. *Overview of the Influence of Fire on Spinifex Ecosystems, with Particular Reference to the Ecosystem of Barrow Island*. Report by Ecaus to the Western Australian Department of Environmental Protection, Perth, WA.
- Dames and Moore 1998. *Second Sales Gas Pipeline Environmental Assessment and Management Document*. Unpublished Report to Apache Energy, February 1998.
- Environmental Protection Authority (EPA) (WA). 2000. *Guidance Statement No. 15 – Emissions of Oxides of Nitrogen from Gas Turbines*. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (EPA) (WA). 2004a. *Cumulative Impacts of Oxides of Nitrogen Emissions from Existing and Proposed Industries*. Section 16(e) Report and Recommendations of the Environmental Protection Authority – Bulletin 1124. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (EPA) (WA). 2004b. *Review of the Fire Policies and Management Practices of the Department of Conservation and Land Management*. Section 16(e) Report and Recommendations of the Environmental Protection Authority – Bulletin 1151. Environmental Protection Authority, Perth, WA.
- Johnson, M.S. 2004. *Genetics of Rhagada Land Snails on Barrow Island*. Unpublished report by the University of Western Australia to RPS Bowman Bishaw Gorham, Perth, WA.
- Maxwell, S., Burbidge, A. and Morris, K. eds. 1996. *The Action Plan for Australian Marsupials and Monotremes*. Final draft report prepared for the IUCN/SSC Australasian Marsupial & Monotreme Specialist Group, Environment Australia, Canberra, ACT.
- National Environment Protection Council. 2003. *National Environment Protection (Ambient Air Quality) Measure*. Office of Legislative Drafting, Attorney-General's Department, Canberra, ACT.
- Nieboer, E., Richardson, D.H.S., Puckett, K.J., and Tomassini, F.D. 1976. The Phytotoxicity of Sulphur Dioxide in Relation to Measurable Responses in Lichens. In: T. Mansfield, ed. *Effects of Air Pollutants on Plants, Society for Experimental Biology, Seminar Series*. Cambridge University Press, Cambridge, UK, pp. 61–85.
- Parsons, B.C., Short, J.C., and Calver, M.C. 2002. Evidence for Male-Biased Dispersal in a Reintroduced Population of Burrowing Bettongs, *Bettongia lesueur*, at Heirisson Prong, Western Australia. *Australian Mammalogy*, 24: 219–224.
- Possingham, H., Jarman, P. and Kearns, A. 2003. *Independent Review of Western Shield. Report of Review Panel*. February 2003. Unpublished Report to the Western Australian Department of Conservation and Land Management.
- Pruett-Jones, S.G., and Tarvin, K.A. 2001. Aspects of the Ecology and Behaviour of White-winged Fairy-wrens on Barrow Island. *Emu*, 101(1): 73–78.
- Sharifi, M.R., Gibson, A.C., and Rundel, A.P. 1997. Surface Dust Impact on Gas Exchange in Mojave Desert Shrubs. *Journal of Applied Ecology*, 43: 837–846.
- Short, J.C. and Turner, B. 2000. Reintroduction of the Burrowing Bettong *Bettongia lesueur* (Marsupialia: Potoroidae) to Mainland Australia. *Biological Conservation*, 96: 185–196.
- Thompson, J.R., Mueller, P.W., Fluckiger, W., and Rutter, A.J. 1984. The Effect of Dust on Photosynthesis and its Significance to Roadside Plants. *Environmental Pollution*, 34: 171–190.
- United Nations Environment Programme (UNEP). 1992. *Rio Declaration on Environment and Development*. United Nations Conference on Environment and Development, Rio de Janeiro, Brazil.
- US Environmental Protection Authority (USEPA). 2004. *National Ambient Air Quality Standards (NAAQS)*. Available at: <http://epa.gov/air/criteria.html> [accessed: 17 June 2004].
- URS. 2002. *Air Quality Impact Assessment of Emissions from the Proposed GTL Resources Methanol Plant, Burrup Peninsula, WA*. Report prepared for GTL Resources, Perth, WA.
- World Health Organisation (WHO). 2000. *Air Quality Guidelines for Europe*, 2nd edn. World Health Organisation Regional Publications, European Series, Number 91. WHO, Copenhagen, Denmark.
- The World Bank Group. 1998. *Pollution Prevention and Abatement Handbook 1998: Toward Cleaner Production*. The World Bank Group in Collaboration with the United Nations Environment Programme and the United Nations Industrial Development Organisation. The World Bank Group, Washington, DC, USA.

## Chapter 11

- ABS Consulting. 2004. *Consequence Assessment Methods for Incidents Involving Releases from Liquefied Natural Gas Carriers*. Report to the Federal Energy Regulatory Commission, Washington, DC.
- Ainley, D.G., Grau, C.R., Roudybush, T.E., Morrell, S.H.S., and Utts, J.M. 1981. Petroleum Ingestion Reduces Reproduction in Cassin's Auklets. *Marine Pollution Bulletin*, 12 (9): 314-317.
- Anthony, K.R.N. and Fabricius, K.E. 2000. Shifting roles of heterotrophy and autotrophy in coral energetics under varying turbidity. *Journal of Experimental Marine Biology and Ecology*, 252: 221-253.
- ANZECC/ARMCANZ. 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality: vol 1, The Guidelines*. Australia and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
- APPEA. 2005. *A Compilation of Recent Research into the Marine Environment*. Australian Petroleum Exploration Association, Sydney.
- Astron Environmental. 2002. *Integrated Shearwater Monitoring Program 8th Annual Report*. Report prepared for Apache Energy, Perth.
- Babcock, R. and Davies, P. 1991. Effects of sedimentation on settlement of *Acropora millepore*. *Coral Reefs*, 9: 205-208.
- Bak, R.P.M. 1978. Lethal and sublethal effects of dredging on reef corals. *Marine Pollution Bulletin*, 9: 14-16.
- Bannister, J.L., Kemper, C.M., and Warnecke, R.M. 1996. *The Action Plan for Australian Cetaceans*. Australian Nature Conservation Agency, Canberra.
- Brown, B.E., Le Tissier, M.D.A., Scoffin, T.P., Tudhope, A.W. 1990. Evaluation of the environmental impact of dredging on intertidal corals at Ko Phuket, Thailand, using ecological and physiological parameters. *Marine Ecology Progress Series*, 65: 273-281.
- Chaloupka, M.Y., and Musick, J.A. 1997. Age, growth, and population dynamics. In: Lutz, P.L., and Musick, J.A. eds. *The Biology of Sea Turtles*. Boca Raton, FL: CRC Press, pp. 233-276.
- Cortés, J. and Risk, M.J. 1985. A reef under saltation stress: Cahuita, Costa Rica. *Bulletin of Marine Science*, 66(2): 339-356.
- Dallmeyer, D.G., Porter, J.W. and Smith, G.J. 1982. Effects of particulate peat on the behaviour and physiology of the Jamaican reef-building coral *Montastrea anularis*. *Marine Biology*, 68: 229-233.
- Dames and Moore. 1998. *Apache Energy Second Sales Gas Pipeline – Environmental Assessment and Management Document*. Apache Energy, Perth, Western Australia.
- Davis, D., Banks, S., Birtles, A., Valentine, P., and Cuthill, M. 1997. Whale Sharks in Ningaloo Marine Park: Managing Tourism in an Australian Marine Protected Area. *Tourism Management*, 18(5): 259-271.
- Department of the Environment and Heritage (Commonwealth). 2003. *Recovery Plan for Marine Turtles in Australia*. Marine Species Section, Approvals and Wildlife Division, Environment Australia, Canberra.
- Department of the Environment and Heritage. 2005. *Humpback Whale Recovery Plan 2005-2010*. Department of the Environment and Heritage, Wildlife Conservation Branch, Canberra, ACT.
- Department of Conservation and Land Management. 2000. *Regional Perspective(s): The Dampier Archipelago and Montebello/Barrow Islands*. Government of Western Australia, Perth.
- Department of Conservation and Land Management (CALM). 2004. *Indicative Management Plan for the Proposed Montebello/Barrow Islands Marine Conservation Reserves*. Marine Conservation Branch, Department of Conservation and Land Management, Western Australia.
- Dickerson, D., Wolters, M., Theriot, C., and Slay, C. 2004. Dredging impacts on sea turtles in the southeastern USA: A historical review of protection. In: Csuti, A. ed. *Proceedings of the World Dredging Congress XVII: Dredging in a Sensitive Environment*, Hamburg, Germany, 27 September-1 October 2004.
- Dodge, R.E. and Vaisnys, J.R. 1977. Coral populations and growth patterns: responses to sedimentation and turbidity associated with dredging. *Journal of Marine Research*, 35(4): 715- 730.
- Edinger, E.N., Jompa, J., Limmon, G.V. Widjatmoko, W. and Risk, M.J. 1998. Reef degradation and coral biodiversity in Indonesia: Effects of land-based pollution, destructive fishing practises and changes over time. *Marine Pollution Bulletin*, 36(8): 617-630.
- Environment Australia. 2001. *Guidelines on the Application of the Environment Protection and Biodiversity Conservation Act to Interactions Between Offshore Seismic Operations and Larger Cetaceans*. Marine Species Section, Canberra.

- Environmental Protection Authority (EPA). 2001. *Guidance Statement for Protection of Tropical Arid Zone Mangroves Along the Pilbara Coastline – Guidance Statement No. 1*. Environmental Protection Authority, Perth, WA.
- Environment Protection Authority (EPA). 2004. *Benthic Primary Producer Habitat Protection for Western Australia's Marine Environment – Guidance Statement No. 29*. Environmental Protection Authority, Perth, WA.
- Forde, M.J. 1985. *Technical report on suspended matter in mermaid sound, Dampier Archipelago*. Bulletin 215, Department of Conservation and Environment, Perth, Western Australia.
- Gilmour, J. 1999. Experimental investigation into the effects of suspended sediment on fertilisation, larval survival and settlement in a scleractinian coral. *Marine Biology*, 125: 451–462.
- Hays, G.C., Mackay, A., Adams, C.R., Mortimer, J.A., Speakman, J.R., and M. Boerema. 1995. Nest site selection by sea turtle. *Journal of the Marine Biological Association of the U.K.*, 75, 667–674.
- Halford, H., and McIlwain, J. 1996. *An Assessment of the Marine Fauna Associated with the RAN Jetty at Point Murat, Exmouth Gulf*. Australian Institute of Marine Science, Dampier.
- Heppell, S.S., Snover, M.J., and L.B. Crowder. 2003. Sea turtle population ecology. In: P. L. Lutz, J.A. Musick, and J. Wyneken. eds. *Biology of Sea Turtles, Volume II*. CRC Press, Boca Raton. pp 275–306.
- Hodgson, D. 1990. Tetracycline reduces sedimentation damage to corals. *Marine Biology*, 104: 493–496.
- IRCE. 2002. *Simpson development: effects of pipeline installation on water quality*. Unpublished report prepared by IRC Environment for Apache Energy, Perth, Western Australia.
- Jenner, K.C.S., Jenner, M.N.M., and McCabe, K.A. 2001. Geographical and Temporal Movements of Humpback Whales in Western Australian Waters. *APPEA Journal*, 2001: 749.
- Kagi, R.I., Fisher, S.J., and Alexander, R. 1988. Behaviour of Petroleum in Northern Australian Waters. In: R.G. Purcell, and R.R. Purcell. eds. *Proceedings of the North West Shelf Symposium, Petroleum Exploration Society of Australia, Perth, Western Australia, 10–12 August 1988*. pp 633–642.
- Klima, E., Gitschlag, G.R., and Renaud, M. 1988. Impacts of the Explosion Removal of Offshore Petroleum Platforms on Sea Turtles and Dolphins. *Marine Fisheries Review*, 50(3): 33–42.
- Larcombe, P. Ridd, P.V., Wilson, B. and Prytz, A. 1994. Sediment data collection. In: Benson, L.J., Goldsworthy, P.M., Butler, I.R. and Oliver, J., eds. *Townsville Port Authority Capital Dredging Works 1993: Environmental Monitoring Program*, 149–63. Townsville Port Authority, Townsville, Queensland.
- LeProvost Environmental Consultants. 1992. *Permit Area TP/3 Part 1 Five Year Drilling Programme: Report on Prospect Sites and Coastal Survey*. Unpublished report to West Australian Petroleum Pty Ltd (WAPET), Perth, WA.
- Limpus, C. J. 2002. *Western Australian Marine Turtle Review*. Study Commissioned by the Department of Conservation and Land Management, Western Australia.
- Limpus, C.J. 2004. *A biological review of Australian marine turtles iii hawksbill turtle Eretmochelys imbricata (Linnaeus)*. Queensland Parks and Wildlife Service. Brisbane.
- Lohmann, K., Witherington, B.E., Lohmann, C.M.F., and Salmon, M. 1996. Orientation, navigation and natal beach homing in sea turtles. In: P.L. Lutz, and J.A. Musick. eds. *The Biology of Sea Turtles*. CRC Press, Boca Raton. pp 107–135.
- Loneragan, N., Kenyon, R., Crocos, P., Ward, R., Lehnert, S., Hayward, M., Arnold, S., Barnard, R., Bravington, M., Burford, M., Caputi, N., Kangas, M., McCulloch, R., Penn, J., Sellars, M., Manson, F., Harch, B., Ye, Y., Toscas, P., and Grewe, P. 2003. *Developing Techniques for Enhancing Prawn Fisheries with a Focus on Brown Tiger Prawns (Panaeus esulentus) in Exmouth Gulf*. FRDC Project 1999/222 Final Report.
- MetOcean Engineers Pty Ltd. 2005. *Gorgon Downstream Cyclonic Channel Siltation Modelling*. Report prepared for ChevronTexaco Australia Pty Ltd, Perth.
- McCauley, R.D., Jenner, M.N., Jenner, C., McCabe, K.A., and Murdoch, J. 1998. The Response of Humpback Whales (*Megaptera novaeangliae*) to Offshore Seismic Survey Noise: Preliminary Results of Observations about a Working Seismic Vessel and Experimental Exposures. *APPEA Journal*, 38(1): 692–707.
- McIlwain, J., and Halford, H. 2001. *A Quantitative Assessment of the Fish and Benthic Assemblages Associated with the Point Murat Navy Pier, Exmouth Gulf*. Australian Institute of Marine Science, Townsville.
- National Research Council. 1990. *Decline of the sea turtles – Causes and prevention*. National Academy Press, Washington, DC. 259 pp.

- Nedwell, J.R., Edwards, B., and Needham, K. 2002. *Noise Measurements During Pipelaying Operations around the Shetland Islands for Magnus EOR Project*. Unpublished report prepared by Subacoustech Ltd for BP Ltd.
- Parmenter, J. 1994. Species Review: The Flatback Turtle – *Nattator depressa*. *Proceedings of the Australian Marine Turtle Conservation Workshop, Sea World Nara Resort*. ANCA, Canberra.
- Parmenter, J. and C.J. Limpus. 1995. Female recruitment, reproductive longevity and inferred hatchling survivorship for the flatback turtle (*Nattator depressus*) at a major eastern Australian rookery. *Copeia*, 2, 474–477.
- Pastorok, R.A. and Bilyard, G.R. 1985. Effects of sewage pollution on coral-reef communities. *Marine Ecology Progress Series*, 21: 175–189.
- Pendoley, K. 1999. *Preliminary report on the analysis of Varanus Island sea turtle monitoring data, 1986–1999*. Unpublished report to Apache Energy, Perth.
- Plotkin, P. 2003. Adult migrations and habitat use. In: P. Lutz, J. Musick and J. Wyneken. eds. *The Biology of Sea Turtles, vol II*. CRC Press, Boca Raton. pp 245–242.
- Prince, R.I.T., Lawler, I.R., and Marsh, H.D. 2001. *The Distribution and Abundance of Dugongs and Other Megavertebrates in Western Australian Coastal Waters Extending Seaward to the 20 Metre Isobath Between North West Cape and the DeGrey River Mouth, Western Australia, April 2000*. Report for Environment Australia, Canberra.
- Randall, R.H. and Birkeland, C. 1978. *Guam's reefs and beaches. Part II. Sedimentation studies at Fouha Bay and Ylig Bay*. University of Guam Marine Laboratory Technical Report No. 47.
- Riegl, B. and Branch, G.M. 1995. Effects of sediment on the energy budgets of four scleractinian (Bourne 1900) and five alcyonacean (Lamouroux 1816) corals. *Journal of Experimental Marine Biology and Ecology*, 186: 259–275.
- Richardson, W.J., Greene, C.R., Malme, C.I., and Thomson, D.H. 1991. *Effects of Noise on Marine Mammals*. Report to Minerals Management Service, LGL Ecological Research Associates Inc., Bryan, Tex. 462 pp.
- Richardson, W.J., Greene Jr., C.R., Malme, C.I., and Thomson, D.H. 1995. *Marine Mammals and Noise*. Academic Press, San Diego.
- Rogers, C.S., 1979. The effect of shading on coral reef structure and function. *Journal of Experimental Marine Biology and Ecology*, 41: 269–288.
- Rogers, C.S., 1983. Sublethal and lethal effects of sediments applied to common Caribbean reef corals in the field. *Marine Pollution Bulletin*, 14: 378–382.
- Rogers, C.S., 1990. Responses of coral reefs and reef organisms to sedimentation. *Marine Ecology Progress Series*, 62: 185–202.
- Sadiq, M., and McCain, J.C. 1993. *The Gulf War Aftermath, an Environmental Tragedy*. Kluwer Academic Publishers, Boston, Massachusetts.
- Salmon, M., Witherington, B.W., and Elvidge, C.D. 2000. Artificial lighting and the recovery of sea turtles. In: N. Pilcher, and Ismaïl, G. eds. *Sea Turtles of the Indo-Pacific: Research Management and Conservation*. ASEAN Academic Press: London. pp 25–34.
- Scholz, D., Michel, J., Shigenaka, G. and Hoff, R. 1992. Chapter 4: Biological Resources. In: *Impacts of Oil Spills on Coastal Ecosystems: Course Manual*. Prepared by Research Planning, Inc., Columbia, SC. Prepared for the Marine Spill Response Corporation: Washington, DC. pp 13–17.
- Stafford-Smith, M.G. and Ormond, R.F.G. 1992. Sediment-rejection mechanisms of 42 species of Australian scleractinian corals. *Australian Journal of Marine and Freshwater Research*, 43: 683–705.
- Stafford-Smith, M.G., Kaly, U.L and Choat, J.H. 1994. Reactive monitoring (short term responses) of coral species. In: Benson, L.J., Goldsworthy, P.M., Butler, I.R. and Oliver, J., eds. *Townsville Port Authority Capital Dredging Works 1993: Environmental Monitoring Program*, 23–54. Townsville Port Authority, Townsville, Queensland.
- Stoddart, J.A. and Anstee, S. 2005. Water quality, plume modelling and tracking before and during dredging in Mermaid Sound, Dampier, Western Australia. In: Stoddart, J.A. and Stoddart, S.E., eds. *Corals of the Dampier Harbour: Their Survival and Reproduction during the Dredging Programs of 2004*, 13–34. MScience, Perth.
- Stoddart, J.A., Blakeway, D.R., Grey, K.A. and Stoddart, S.E. 2005. Rapid high-precision monitoring of coral communities to support reactive management of dredging in Mermaid Sound, Dampier, Western Australia. In: Stoddart, J.A. and Stoddart, S.E., eds. *Corals of the Dampier Harbour: Their Survival and Reproduction during the Dredging Programs of 2004*, 35–52. MScience, Perth.

- Swan, J.M., Neff, J.M., and Young, P.C. eds. 1994. *Environmental Implications of Offshore Oil and Gas Development in Australia – the Findings of an Independent Scientific Review*. Australian Petroleum Production and Exploration Association, Canberra.
- Te, F.T. 1992. Response to higher sediment loads by *Pocillopora damicornis* planulae. *Coral Reefs*, 11: 131–134.
- Torres, J.L. and Morelock, J. 2002. Effect of terrigenous sediment influx on coral cover and linear extension rates of three Caribbean massive coral species. *Caribbean Journal of Science*, 38(3-4): 222–229.
- Umar, J., L. J. McCook, and I. R. Price. 1998. Effects of sediment deposition on the seaweed *Sargassum* on a fringing coral reef. *Coral Reefs*, 17: 169-177.
- van Woelk, R., Tomascik, T. and Blake, S. 1999. Coral assemblages and physico-chemical characteristics of the Whitsunday Islands: evidence of recent community changes. *Marine and Freshwater Research*, 50: 427–440.
- Volkman, J.K., Miller, G.J., Revill, A.T., and Connell, D.W. 1994. Environmental implications of offshore oil and gas development in Australia - oil spills. In: Swan, J.M., Neff, J.M. and Young, P.C. eds. *Environmental implications of offshore oil and gas development in Australia – the findings of an independent scientific review*. Australian Petroleum Exploration Association, Sydney.
- Wesseling, I., Uychiaoco, A.J., Alino, P.M., Aurin, T. and Vermaat, J.E. 1999. Damage and recovery of four Philippine corals from short-term sediment burial. *Marine Ecology Progress Series*, 176: 11–15.
- Wittenberg, M. and Hunte, W. 1992. Effects of eutrophication and sedimentation on juvenile corals. I. Abundance, mortality and community structure. *Marine Biology*, 112: 131–138.
- Wilson, B.R., and Allen, G.R. 1987. Major components and distribution of marine fauna. In: G.W. Dyne. ed. *Fauna of Australia. Vol. 1A. General Articles*. Australian Government Publishing Service, Canberra, 43–68.
- Witherington, B. E. 1992. Sea-finding Behaviour and the Use of Photic Orientation Cues by Hatchling Sea Turtles. PhD thesis, University of Florida, Gainesville.
- Witherington, B. E., and K. A. Bjorndal. 1991. Influences of Wavelength and Intensity on Hatchling Sea Turtle Phototaxis: Implications for Sea-finding Behaviour. *Copeia*, 4: 1060–1090.
- Witherington, B.E., and Martin, R. E. 1996. *Understanding, Assessing and Resolving Light Pollution Problems on Sea Turtle Nesting Beaches*. Florida Marine Research Institute Technical Report. Florida Marine Research Institute, St. Petersburg, Florida.
- Witherington, B.E., and Martin, R.E. 2000. *Understanding, assessing, and resolving light-pollution problems on sea turtle nesting beaches*. 2nd ed. Rev. Florida Marine Research Institute Technical Report TR-2. 73 p.
- Woodside Energy Ltd. 1997. *North West Shelf Gas Project – Domgas Debottle-necking and 2nd Trunkline Installation Project – Public Environmental Review and Public Environmental Report*. Woodside Offshore Petroleum Pty Ltd, Perth, WA.
- Woodside Energy Ltd. 2003. *WA-271-P Field Development Draft Environmental Impact Statement*. Woodside Energy Ltd, Perth.

## Chapter 12

- Andersen, M., Adams, H., Hope, B. and Powell, M. 2004. Risk Assessment for Invasive Species. *Risk Analysis*, Vol. 24(4): 787–793.
- Animal Health Australia. 2002. *Summary Document (Edition 3.0), Australian Veterinary Emergency Plan (AUSVETPLAN)*, Edition 3. Animal Health Australia, Canberra, ACT. Available at: [www.aahc.com.au/ausvetplan](http://www.aahc.com.au/ausvetplan) [accessed: 8 Feb 2005].
- AS/NZS ISO 14001:1996. *Environmental Management Systems – Specification with Guidance for Use*. Standards Australia/Standards New Zealand, Standards Australia. Homebush, NSW.
- AS/NZS 4360:2004. *Risk Management*. Standards Australia/Standards New Zealand, Standards Association of Australia, Strathfield, NSW.
- Berry, P.F. and Wells, F.E. 2000. Survey of the Marine Fauna and Habitats of the Montebello Islands, Western Australia. *Records of the Western Australian Museum*, Supplement, 59: 1–63.
- Biosecurity Australia. 2003. *Import Risk Analysis Handbook*. Agriculture, Fisheries and Forestry Australia, Canberra, ACT.
- Carlton, J.T. 2002. *Introduced Species in U.S. Coastal Waters: Environmental Impacts and Management Priorities*. Pew Oceans Commission, Arlington, Virginia, USA.
- Center for Chemical Process Safety (CCPS). 1992. *Guidelines for Hazard Evaluation Procedures*. Center for Chemical Process Safety, American Institute of Chemical Engineers, New York, USA.

- ChevronTexaco Australia. 2003. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.
- ChevronTexaco Australia 2004. *Guidelines for an Environmental Impact Statement and Environmental Scoping Document for an Environmental Review and Management Programme for the Proposed Gorgon Development*. Gorgon Australian Gas, Perth, WA. This document is available from the Gorgon Development's website (<http://www.gorgon.com.au>).
- Department of Agriculture (Western Australia). 2003. *Protocols for Generic Incident Management in the Department of Agriculture*. Perth, WA.
- Department of Agriculture Fisheries and Forestry (Commonwealth). 2001. *Control Centres Management Manual (Version 1.0), Australian Aquatic Animal Diseases Emergency Plan (AQUAVETPLAN)*. Canberra, ACT. Available at: [www.daff.gov.au/aquavetplan](http://www.daff.gov.au/aquavetplan) [accessed: 8 Feb 2005].
- Environmental Protection Authority (EPA) (WA). 2003. *Environmental Advice on the Principle of Locating a Gas Processing Complex on Barrow Island Nature Reserve – Gorgon Venture*. Section 16 Report and Recommendations of the Environmental Protection Authority, Bulletin 1101. EPA, Perth, WA.
- Food and Agriculture Organisation (FAO). 1996. *International Standards for Phytosanitary Measures – Guidelines for Pest Risk Analysis*. Publication No. 2, Secretariat of the International Plant Protection Convention, Food and Agriculture Organisation of the United Nations, Rome, Italy.
- Hayes, K.R. 2002. Identifying Hazards in Complex Ecological Systems. Part 2: Infection Modes and Effects Analysis for Biological Invasions. *Biological Invasions*, 4(3): 251–261.
- Hayes, K.R. and Hewitt, C.L. 1998. *Risk Assessment Framework for Ballast Water Introductions*. Technical Report No. 14. Centre for Research on Introduced Marine Pests (CRIMP), Commonwealth Scientific and Industrial Research Organisation, Marine Research, Hobart, Tas.
- Hewitt, C.L. and Martin, R.B. 2001. *Revised Protocols for Baseline Port Surveys for Introduced Marine Species: Survey Design Sampling Protocols and Specimen Handling*. Technical Report No. 22. Centre for Research on Introduced Marine Pests, Commonwealth Scientific and Industrial Research Organisation, Marine Research, Hobart, Tas.
- Huisman, J.M., 2004 (in press). The Dampierian Province. In: Orchard, T. ed. *Algae of Australia*. Vol. 1. Introduction.
- Joint Standing Committee on Conservation/ Standing Committee on Fisheries and Aquaculture (SCC/SCFA). 1999. *Standing Committee on Conservation/ Standing Committee on Forestry and Aquaculture National Taskforce on the Prevention and Management of Marine Pest Incursions*. Final Report. Environment Australia, Canberra, ACT.
- Jones, D.S. 1991. A History of the Discovery and Description of Australian Barnacles (Cirripedia: Thoracica), Including a Bibliography of Reference Works. *Archives of Natural History*, 18(2): 149–178.
- Jones, D.S. 1992. A Review of Australian Fouling Barnacles. *Asian Marine Biology*, 9: 89–100.
- Jones, D.S. 2003. The Biogeography of Western Australian Shallow-water Barnacles. In: Wells, F.E., Walker, D.I. and Jones, D.S. eds. *Proceedings of the Eleventh International Marine Biological Workshop: The Marine Flora and Fauna of Dampier, Western Australia*, 2: 479–496. Western Australian Museum, Perth, WA.
- Jones, D.S. ed. 2004a (in press). Report on the Results of the Western Australia Museum/Woodside Energy Ltd Partnership to Explore the Marine Biodiversity of the Dampier Archipelago, Western Australia, 1998–2002. *Records of the Western Australian Museum*, Supplement No. 66: 121–157.
- Jones, D.S. 2004b (in press). Barnacles (Cirripedia: Thoracica) of the Dampier Archipelago. Marine Fauna and Flora and Habitats of the Waters of the Dampier Archipelago, Western Australia. Report of the Woodside Energy Ltd/Western Australia Museum Partnership to explore the Marine Biodiversity of the Dampier Archipelago, 1998–2000. *Records of the Western Australian Museum*, Supplement No. 66: 1–402.
- McDonald, J. 2004. *Baseline Sampling and Monitoring Protocol to Detect Introduced Species and Marine Community Change Associated with the Gorgon Gas Project at Barrow Island*. Advice prepared for ChevronTexaco, Perth, WA.
- McEnulty, F., Bax, N., Schaffelke, B., and Campbell, M. 2001. *A Review of Rapid Response Options for the Control of Australian Ballast Water Management Advisory Council (ABWMAC) Listed Introduced Marine Species and Related Taxa in Australian Waters*. Technical Report No. 23. CRIMP, Hobart, Tas.
- McNeely, J.A., H.A. Mooney, L.E. Neville, P. Schei, and J.K. Waage (eds.) 2001. *A Global Strategy on Invasive Alien Species*. IUCN, Gland, Switzerland and Cambridge, UK.

- NIMPIS. 2002. National Introduced Marine Pest Information System. *In*: Hewitt C.L., Martin R.B., Sliwa C., McEnulty, F.R., Murphy, N.E., Jones T. and Cooper, S., (eds.) Available at: <http://crimp.marine.csiro.au/nimpis> [accessed: 5 May 2004].
- NZ Department of Conservation. 2003. *Quarantine and Contingency Plan for Islands in the South-west Conservancy*. Wellington, New Zealand.
- Royal Commission on Environmental Pollution (RCEP). 1991. *GENHAZ – A System for the Critical Appraisal of Proposals to Release Genetically Modified Organisms into the Environment*. Royal Commission on Environmental Pollution, Fourteenth Report, London, UK.
- Russell, B.C., Neil, K., Hilliard, R. 2003. *Ashmore Reef National Nature Reserve and Cartier Island Marine Reserve – Marine and Terrestrial Introduced Species Prevention and Management Strategy*. Report for Department of Environment and Heritage, Canberra, ACT.
- Short, J. 2004. *Baseline Survey and Subsequent Monitoring Strategy to Detect Exotic Terrestrial Species on Barrow Island*. CSIRO. Unpublished report prepared for ChevronTexaco Australia, Perth, WA.
- URS. 2003. *Best Practice for the Management of Introduced Marine Pests – Compilation of Information*. Draft Unpublished Report No. R1031 (for review) to the Global Invasive Species Programme Secretariat, prepared by URS Australia, East Perth, WA.
- USDA. 2000. *Guidelines for Pathway-initiated Pest Risk Assessments*. US Department of Agriculture, Animal and Plant Health Inspection Service, Version 5.02, Riverdale, Maryland, USA.
- Wells, F.E. 1980. The Distribution of Shallow-water Marine Prosobranch Gastropods Along the Coastline of Western Australia. *Veliger*, 22: 232–247.
- Western Australian Museum. 2004. *Draft Barrow Island Marine Quarantine Baseline Strategy*. Western Australian Museum, Perth, WA.
- Wilson, B.R. and Allen, G.R. 1987. Major Components and Distribution of Marine Fauna. *In*: Dyne, G.R. and Walton, D.W. eds. *Fauna of Australia*. General articles. Australian Government Publishing Service, Canberra, ACT. Volume 1A, pp. 43–68.
- ## Chapter 13
- ACIL Tasman. 2004. *Greenhouse Gas Emission Offsets Study*. Internal report prepared for ChevronTexaco Australia, Perth, WA.
- American Petroleum Institute. 2004. *Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry*. Available at: [www.api.org](http://www.api.org) [accessed: 12 May 2005].
- AS/NZS 3931:1998. *Risk Analysis of Technological Systems – Application Guide*. Jointly Published by Standards Australia International Ltd, Sydney, NSW and Standards New Zealand, Wellington, NZ.
- AS/NZS 4360:2004. *Risk Management*. Jointly Published by Standards Australia International Ltd, Sydney, NSW, and Standards New Zealand, Wellington, NZ.
- Australian Greenhouse Office. 2004. *Australia's 2002 National Inventory*. Available at: [www.greenhouse.gov.au/inventory/2002/index.html](http://www.greenhouse.gov.au/inventory/2002/index.html) [accessed: 12 May 2005].
- Benson S.M. 2004. *Monitoring Protocols and Life-Cycle Costs for Geologic Storage of Carbon Dioxide*. Paper presented at the Carbon Sequestration Leadership Forum, September 2004, Melbourne, Vic. Available at: [www.cslforum.org/presentations.htm](http://www.cslforum.org/presentations.htm) [accessed: 12 May 2005].
- Benson S.M., Apps J., Hepple R., Lippman M., Tsang C.F., and Lewis C., 2002. Health, Safety and Environmental Risk Assessment for Geologic Storage of Carbon Dioxide: Lessons Learned From Industrial and Natural Analogues. *In*: J. Gale and Y. Kaya (eds). *Proceedings of the Sixth International Conference on Greenhouse Gas Control Technologies, GHGT-6*, September 30–October 4, 2002, Kyoto, Japan, Vol. 1, pp. 243–248.
- Bowden A.R. and Rigg A., 2004. Assessing Risk on CO<sub>2</sub> Storage Projects. *APPEA Journal*, 2004: 667–702.
- ChevronTexaco Australia. 2003. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.
- ChevronTexaco Australia. 2005. *Gorgon CO<sub>2</sub> Injection Project Barrow Island Well Remediation*. Internal report, April 2005. ChevronTexaco Australia, Perth, WA.
- CMPT. 1999. *A Guide to Quantitative Risk Assessment of Offshore Installations*. Centre of Maritime and Petroleum Technology, Aberdeen. Available at: [www.mtd.org.uk/pubs.html](http://www.mtd.org.uk/pubs.html) [accessed: 7 June 2005].
- ConocoPhillips. 2002. *Darwin 10 MTPA LNG Facility Public Environmental Report*. Available at: [www.darwinlng.com/environment.asp](http://www.darwinlng.com/environment.asp) [accessed: 12 May 2005].

- Commonwealth Scientific and Industrial Research Organisation (CSIRO). 1996. *Gorgon Greenhouse Gas Studies*. Report prepared for Western Australian Petroleum Pty Ltd, Perth, WA.
- Damen, D., Faaij A., and Turkenburg, W. 2003. *Health, Safety and Environmental Risks of Underground CO<sub>2</sub> Sequestration, Overview of Mechanisms and Current Knowledge*. Copernicus Institute for Sustainable Development and Innovation. Utrecht University, Netherlands.
- Department of Industry Science and Resources. 2000. *Liquefied Natural Gas Action Agenda*. Commonwealth of Australia, Canberra, ACT. Available at: [www.industry.gov.au/content/itrinternet/cmscontent.cfm?objectID=675EEBF3-EE11-4731-8B315E8F69DEBF33](http://www.industry.gov.au/content/itrinternet/cmscontent.cfm?objectID=675EEBF3-EE11-4731-8B315E8F69DEBF33) [accessed: 12 May 2005].
- Department of Industry and Tourism. 2004. *Consultation Regulatory Impact Statement, Draft Guiding Regulatory Framework for Carbon Dioxide Geosequestration*. Available at: [www.industry.gov.au/content/azindex.cfm?keyword=climate%20change&indexpages=/content/azindex.cfm](http://www.industry.gov.au/content/azindex.cfm?keyword=climate%20change&indexpages=/content/azindex.cfm) [accessed: 12 May 2005].
- Environmental Protection Authority. 2002. *Guidance for the Assessment of Environmental Factors No 12. Guidance Statement for Minimising Greenhouse Gas Emissions*. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority. 2003. *Guidance for the Assessment of Environmental Factors No 4. Deep and Shallow Well Injection of Liquid Industrial Waste*. Environmental Protection Authority, Perth, WA.
- Gale, J. and Davison, D. 2003. Transmission of CO<sub>2</sub>: Safety and Economic Considerations. In: Gale, J. and Kaya, Y., editors. *Sixth International Conference on Greenhouse Gas Control Technologies*, Kyoto, Japan, Vol. 1. Pergamon, Amsterdam, pp. 517–522.
- Government of Western Australia. 2004. *Western Australian Greenhouse Strategy*. Available at: [www.greenhouse.wa.gov.au/index.cfm?fuseaction=home.news](http://www.greenhouse.wa.gov.au/index.cfm?fuseaction=home.news) [accessed: 12 May 2005].
- McCue K., Van Dissen R., Gibson G., Jensen, V. and Boreham, B. 2003. The Lake Edgar Fault: an Active Gault in South-western Tasmania, Australia, with Tepeated Displacement in the Quaternary. *Annals of Geophysics*, 46(5): 1107–1117.
- NOHSC. 2005. *Exposure Database*. National Occupational Health and Safety Commission. Available at: [www.nohsc.gov.au/OHSInformation/Databases/ExposureStandards/toc/C.htm](http://www.nohsc.gov.au/OHSInformation/Databases/ExposureStandards/toc/C.htm) [accessed: 12 May 2005].
- WAPET. 1998. *Gorgon Development Greenhouse Challenge Commonwealth Cooperative Agreement (Greenhouse Gas Management Plan)*. Internal document, November 1998. Western Australian Petroleum Ltd, Perth, WA.
- Woodside. 2004. *Liquefied Natural Gas (LNG) Expansion Project Greenhouse Gas Management Plan*. Woodside Energy Limited, Perth, WA.
- Yost, C. and DiNapoli, R. 2003. Benchmarking Study Compares LNG Plant Costs. *Oil and Gas Journal*, April: 56–59.

## Chapter 14

- AS 2885.1:1997. *Pipelines – Gas and Liquid Petroleum*. Standards Australia, Homebush, NSW.
- AS/NZ 4360:1999. *Risk Management*. Standards Australia, Strathfield, NSW.
- ChevronTexaco Australia. 2003. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, Australia.
- ChevronTexaco Australia 2004. *Guidelines for an Environmental Impact Statement and Environmental Scoping Document for an Environmental Review and Management Programme for the Proposed Gorgon Development*. Gorgon Australian Gas, Perth, WA. This document is available from the Gorgon Development's website (<http://www.gorgon.com.au>).
- Department of Conservation and Land Management (CALM). 2004. *Indicative Management Plan for the Proposed Montebello/Barrow Islands Marine Conservation Reserves*. Department of Conservation and Land Management, Perth, WA.
- Department of Industry and Resources (DoIR) (WA). 2003. *2002/2003 Resource Sector Summary Report*. Department of Industry and Resources, Perth, WA.
- Department of Planning (NSW). 1997. *Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazardous Analysis*. NSW Department of Planning, Sydney, NSW.
- Environmental Protection Authority (EPA) (WA). 2000. *Guidance for Risk Assessment and Management: Offsite Individual Risk: Hazardous Industrial Plant. No. 2*. Environmental Protection Authority, Perth, WA.
- Environmental Protection Authority (EPA) (WA). 1992. *Criteria for the Assessment of Risk from Industry – Expanded Discussion – Bulletin 627*. Environmental Protection Authority, Perth, WA.

- Environmental Protection Authority (EPA) (WA). 1994. *Risk Criteria – On-Site Risk Generation for Sensitive Developments, Modifications to Sensitive Development Criterion – On-Site Risk – Bulletin 730*. Environmental Protection Authority, Perth, WA.
- Lambert, D. 2001. *Long Distance Commuting in Western Australia: Problems and Perspectives*. Available at: <http://www.mp.wa.gov.au/rchapple/issues/fifo/fifo.rtf> [accessed: 24 Nov 2004].
- Pilbara Development Commission. 2003. *Pilbara Regional Priority Plan: Compiled for Cabinet Standing Committee on Regional Policy*. Available at: <http://www.pdc.wa.gov.au/pdf/Pilbara%20Regional%20Priority%20Plan.pdf> [accessed: 26 Nov 2004].
- Pilbara Development Commission. 1997. *The Pilbara Land Use Strategy*. Pilbara Development Commission, Karratha, WA.
- Quartermaine Consultants. 1994. *Report on an Archaeological Survey Programme, Barrow Island*. Unpublished report to West Australian Petroleum Pty Ltd, Perth, WA.
- Quartermaine, G. 1997. *Addendum to the Report on an Archaeological Survey Programme, Barrow Island*. Unpublished report to West Australian Petroleum Pty Ltd, Perth, WA.
- Shire of Ashburton. 2004. *Town Planning Scheme No.7*. Shire of Ashburton, WA.
- Western Australian Planning Commission. 1998. *Karratha Area Development Strategy – Final*. Government of Western Australia. Available at: [www.wapc.wa.gov.au/publications/issues/policies/final-karratha/karratha.html](http://www.wapc.wa.gov.au/publications/issues/policies/final-karratha/karratha.html) [accessed: 24 Nov 2004].
- Western Australian Planning Commission. 2003. *Onslow Structure Plan. Final 2003*. Government of Western Australia. Available at: <http://www.wapc.wa.gov.au> [accessed: 24 Nov 2004].
- World Bank. 1999. *Operational Manual: Environmental Assessment*. Available at: [wbIn0018.worldbank.org/Institutional/Manuals/OpManual.nsf/0/9367A2A9D9DAEED38525672C007D0972?OpenDocument](http://wbIn0018.worldbank.org/Institutional/Manuals/OpManual.nsf/0/9367A2A9D9DAEED38525672C007D0972?OpenDocument) [accessed: 9 May 2005].

## Chapter 15

- Access Economics. 2002. *National and Western Australian Economic and Fiscal Impacts of the Gorgon Gas Supply and LNG Projects*. Final Report to ChevronTexaco Australia, Perth, WA.
- Allen Consulting Group (The). 2003. *Proposed Access to Barrow Island for Gas Development: Advice on Social, Economic and Strategic Considerations*. Report to the WA Department of Industry and Resources. Perth, WA. Available at: [www.allenconsult.com.au/resources/Gorgon.pdf](http://www.allenconsult.com.au/resources/Gorgon.pdf) [accessed: 21 August 2004].
- ChevronTexaco Australia, 2003. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.

## Chapter 16

- AS.NZS ISO 14001:2004. *Environmental Management Systems – Requirements with Guidance for Use*. Available at: [www.standards.com.au/catalogue/Script/Details.asp?docn=AS0733764061AT](http://www.standards.com.au/catalogue/Script/Details.asp?docn=AS0733764061AT) [accessed: 25 May 2005].

## Chapter 17

- ChevronTexaco Australia 2004. *Guidelines for an Environmental Impact Statement and Environmental Scoping Document for an Environmental Review and Management Programme for the Proposed Gorgon Development*. Gorgon Australian Gas. Perth, Western Australia. This document is available from the Gorgon Development's website (<http://www.gorgon.com.au>).
- ChevronTexaco Australia. 2003. *Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island*. Gorgon Australian Gas, Perth, WA.
- Department of Conservation and Land Management (CALM). 2004. *Indicative Management Plan for the Proposed Montebello/Barrow Islands Marine Conservation Reserves*. Marine Conservation Branch, Department of Conservation and Land Management, Western Australia.
- Environmental Protection Authority (EPA) (WA). 2003. *Environmental Advice on the Principle of Locating a Gas Processing Complex on Barrow Island Nature Reserve – Gorgon Venture*. Section 16 Report and Recommendations of the Environmental Protection Authority, Bulletin 1101. EPA, Perth, WA.
- Government of Western Australia. 2003. *Hope for the future: The Western Australian State Sustainability Strategy*. Department of the Premier and Cabinet, Perth.





# Glossary

## Glossary

Term	Definition
Acid gas	A mixture of hydrogen sulphide (H <sub>2</sub> S) and carbon dioxide (CO <sub>2</sub> ).
Aggregate	An essentially inert material of mineral origin having a particle size predominantly greater than 10 mesh. Also a group of two or more individual particles held together by strong forces which are not subject to dispersion by normal mixing or handling.
a-MDEA	A chemical which is commonly used to remove CO <sub>2</sub> and other acid gases from a natural gas stream, especially in Liquefied Natural Gas plants.
Allotrophy	External inputs of organic matter to an ecosystem.
Allozyme	Alternative forms of the same protein coded for by different genes at the same locus.
Annual species (flora)	A plant that completes its life cycle and dies within one year or less.
Aytid	Decapod crustacean belonging to the family Aytidae.
Baffle	Layers of rock which are slightly permeable to CO <sub>2</sub> over the nominated time-scale and/or lack of sufficient predictable areal extent to constitute an identifiable barrier.
Barrel (of oil)	A volume of 159 litres (of oil).
Barriers (CO <sub>2</sub> Injection)	Layers of rock which have sufficient areal extent to provide a major and predictable block to the upward movement of CO <sub>2</sub> over the hundreds to thousands of years.
Barrier (quarantine context)	For the purposes of assessing and managing quarantine risk, any physical, chemical, biological, procedural or administrative process which prevents an alien species from being introduced to a native environment outside of its natural range.
Benthic	Living in or utilising the bank or bed surface of water bodies.
Best Practice	Best practice involves the prevention of environmental impact or, if this is not practicable, minimising the environmental impact through the incorporation of 'Best Practicable Measures'.
Best Practicable Measures	Best Practicable Measures are technological and environmental management procedures which are practicable, having regard to, among other things: local conditions and circumstances, including costs; and to the current state of technical knowledge, including the availability of reliable, proven technology.
Biochemical Oxygen Demand (BOD)	A standardised measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. It is measured as the quantity of dissolved oxygen (mg/l) required during stabilisation of the decomposable organic matter by aerobic biochemical action. Commonly abbreviated as BOD.
Biodiversity	Biodiversity is a term used to describe collectively the variety and variability of nature which encompasses the genetic, species, and ecosystem level of organisation in living systems.
Biota	The sum of all living organisms of an ecosystem, or of a defined area or period.
Bombora	A coral structure that rises to, but does not break, the surface.
Bonn Convention	Framework for the conservation and management of migratory species (including waterfowl and other wetland species) and promotion of measures for their conservation including habitat conservation.
Border (quarantine context)	The point of entry of cargoes, vessels or people on Barrow Island. The 'marine pathway' border is the waters surrounding Barrow Island; the 'air pathway' border is the Barrow Island airport, and for the 'personnel, food and perishables pathway' the border is the village.
Breach (quarantine context)	The failure to undertake all of the requirements of the quarantine management protocol.
BTEX	This is an acronym for benzene, toluene, ethylbenzene, and xylene. This group of volatile organic compounds (VOCs) is found in petroleum hydrocarbons, such as gasoline.
Bulldozer Grubbing	Removal of vegetation stumps and roots.
Bund	An earth, rock or concrete wall constructed to prevent the inflow or outflow of liquids.

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Term	Definition
Carbon Dioxide Equivalents	A measure used to compare various greenhouse gases based upon their global warming potential.
Chemoautotroph	An organism that obtains energy by oxidising inorganic compounds.
Chemolithotroph	An organism that obtains its energy from the oxidation of inorganic compounds.
Choke	A piece of equipment which enables the flow from a well to be controlled at the rate required.
Christmas Tree	Assembly of equipment, including tubing head adapters, valves, tees, crosses, top connectors and chokes attached to the uppermost connection of the tubing head, used to control well production.
Community (Ecological)	A group of species inhabiting a common environment and interacting with one another.
Conservation Values	Natural assets or attributes of an area that are of conservation significance. Key conservation values of Barrow Island include: <ul style="list-style-type: none"> <li>• unique fauna species and a high level of biodiversity</li> <li>• a suite of native marsupials that once occurred on the mainland but are now threatened or extinct there</li> <li>• an absence of introduced fauna species</li> <li>• potential as a source for controlled re-introductions to other areas</li> <li>• a rich marine environment and its various components (e.g. coral reefs, intertidal flats, marine mammals and turtles)</li> <li>• importance as a staging area for migratory birds</li> <li>• various subterranean fauna components and their affinities and differences to populations on the mainland.</li> </ul>
Critically Endangered Species (EPBC Act)	A native species is considered critically endangered if it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with prescribed EPBC Act criteria.
Cryptogenic	A species that is not demonstrably native or introduced. Geographic origin unknown.
Cumulative Effects	Progressive environmental degradation over time resulting from a range of activities/sources in an area or region.
dB(A)	Abbreviation for 'decibel adjusted' or 'A-weighted decibel' – a decibel is a logarithmic unit of sound intensity; (10 times the logarithm of the ratio of the sound intensity to some reference intensity). Noise limits are sometimes qualified with the symbol Leq. Leq is defined as the equivalent continuous sound pressure level, which represents the average of a 24-hour noise history at a location. The Leq is used when it is important to consider variations in noise over time, such as between day and night. The ambient (or existing background) noise level is symbolized by L <sub>90</sub> or L <sub>95</sub> (the noise level present 90% or 95% of the time).
Detritus	Accumulated organic debris from dead organisms.
Double Containment Tank	Double containment tanks are designed and constructed so that both the inner- and outer-tank are capable of independently containing the refrigerated liquid. The inner-tank contains the LNG under normal operating conditions. The outer-tank or wall is intended to contain any LNG leakage from the inner-tank and the boil-off gas. Most LNG storage tanks built recently around the world were designed as double- or full-containment tanks.
Drilling Fluid	A fluid circulated through the borehole during drilling and work-over operations to remove rock cuttings made by the drill. Drilling fluid also helps to cool the bit, prevent the sides of the borehole from caving and control flow of rock fluids into the borehole.
Easement	A right held by the proponent to make use of the land of another for the installation and operation of a pipeline. Also referred to as a right of way.
Ecological Risk Assessment	A set of formal scientific methods for estimating the likelihoods and magnitudes of effects on plants, animals and ecosystems of ecological value resulting from the release of chemicals, other human actions or natural incidents.
Ecomorph	Species morphology that fits a specific set of ecological requirements.

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Term	Definition
Ecosystem	The biotic and abiotic environment within a specified location in space and time.
Electrophoresis	A laboratory technique for separating proteins based on their different mobility through an electrical field.
Endangered Species (EPBC Act)	A native species is considered endangered if it is not critically endangered and it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with prescribed EPBC Act criteria.
Endemic	A species unique to an area; found nowhere else.
Environmental Management	The sum of the day-to-day activities that are designed to mitigate a development's environmental impacts by either avoiding them or reducing them to within 'acceptable limits'.
Epibenthic Fauna	Benthic fauna that live above or amongst the sea floor.
Epifauna	Benthic fauna that live on the surface of the bottom, or floor, of a water body.
Epigeal	Terrestrial fauna dwelling in habitats on the ground surface.
Ephemeral	Short-lived species.
Eradication	The elimination of every individual of an introduced species and its progeny from Barrow Island.
Eremaean	A general term used to describe the type of plants (families), soil types and rainfall in the arid zone.
Establishment (quarantine context)	Refers to the process of an introduced non-indigenous species successfully reproducing viable offspring with the likelihood of continued survival.
Evolutionary Significant Units	An Evolutionary Significant Unit is a sub-portion of a species that is defined by substantial reproductive isolation from other con-specific units and represents an important component of the evolutionary legacy of the species.
Exposure (risk assessment context)	The contact or co-occurrence of a stressor with a receptor.
Factor (risk assessment context)	Elements of the physical, biological or social environment.
Fauna	Animals characteristic of a region or special environment.
Flash Gas	A gas that is liberated from solution in oil as a result of increasing the space occupied, increasing the temperature, and/or decreasing the pressure.
Flash Vessel (Gas Flashing)	A conventional oil-and-gas separator operated at low pressure, with the liquid from a higher-pressure vessel being 'flashed' into it. Also known as a flash trap.
Flocculate	A group of aggregates or particles in suspension subject to being broken up by normal shaking and stirring and reforming on standing.
Flora	Plants characteristic of a region or special environment.
Fractionation	A process by which a mixed hydrocarbon stream is separated into its constituent components, e.g. a mixed natural gas stream is split into a methane stream, an ethane stream, a propane stream, a butane stream and a liquid stream containing components which are heavier than butane.
Fugitive Emissions	Substances that escape to air from sources not associated with a specific process e.g. leaks from equipment; dust blown from stockpiles.
Full Containment Tank	Full containment tanks typically feature a primary liquid containment open-top inner-tank and a concrete outer-tank. The outer-tank provides primary vapour containment and secondary liquid containment. In the unlikely event of a leak, the outer-tank contains the liquid and provides controlled release of the vapour.
Gabion	A wire basket filled with stones, or similar material, and used for erosion control purposes.
Gas Processing Facility (Gorgon Development)	Liquefied Natural Gas plant (for export market) and domestic gas plant (for domestic market).
Genetic Diversity	Measure of the total number of genes within a population.

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Term	Definition
Genus (Plural Genera)	Taxonomic group containing one or more species.
Geotechnical	Relating to the (Gorgon Joint Venturers') engineering study of subsurface soils; involves specialised drilling or sampling for soil analysis and testing.
Gorgon Joint Venturers (Joint Venturers)	Chevron Australia Pty Ltd, Texaco Australia Pty Ltd, Shell Development Australia Pty Ltd, Mobil Australia Resources Company Pty Ltd. Chevron is the operator and proponent of the proposed Gorgon Development on behalf of these companies.
Gorgon Wider Study Area	Study area of approximately 1683 ha surrounding the proposed gas processing facility, administration building, and construction village.
Greenhouse Gas Intensity	A measure of the greenhouse gas emissions emitted in order to produce a unit of product. In this Draft EIS/ERMP, greenhouse intensity is stated as tonnes of carbon dioxide equivalents (CO <sub>2</sub> e) per tonne of LNG produced. Note: this metric generally does not include greenhouse gas emissions related to gas production, such as those from offshore gas production platforms.
Gross Domestic Product	The total money value of all final goods and services produced in the national economy of a one-year period.
Ground Level Concentration	Measured or estimated concentrations of a pollutant at ground level, estimated values are derived from pollutant dispersion models.
Groundwater	Underground water contained within a saturated zone or rock.
Habitat	The place or type of site in which an organism occurs naturally.
Habitat Heterogeneity	Diversity of habitats within an area.
Hazard (risk assessment context)	A source of potential harm, or a situation with a potential to cause loss or adverse effect.
HAZOP	A Hazard and Operability Study is a formal process to identify hazards, quantify their impact, and analyse problems associated with a given process.
Heterotrophy	The process where existing organic molecules are used by an organism for its energy needs. All organic constituents in the organism are derived from pre-formed organic molecules.
Hydrate	An ice-like material which is comprised of water and hydrocarbons. It forms at high pressures and low temperatures.
Hydrostatic Testing (or Hydrotesting)	The testing of piping or tubing by filling with water and pressurising to test for integrity.
Ichthyofauna	Fish life of an area.
Incursion (quarantine context)	The discovery on Barrow Island of a live, non-indigenous species.
Infauna	Aquatic animals that live in the bottom sediment of a body of water.
Infection (quarantine context)	The contamination at any step in an exposure pathway of cargoes, vessels or people by non-indigenous species. The likelihood is estimated by independent technical experts in risk assessment workshops.
Insurance	A risk management strategy which is implemented to protect against possible impacts associated with the proposed Development (e.g. translocation).
Intelligent Pig	An electronic device inserted periodically into a pipeline to clean and check its integrity. The term 'intelligent' refers to it containing electronics which can accurately detect, size, and locate corrosion or any other anomalies in pipelines.
Internesting	Interval between individual turtle nesting events when a new clutch of eggs is being formed inside the female.
Intercellular Microalgae	Microscopic algae that live within the cells of other organisms.
Intertidal	The area between the high and low water marks.

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Term	Definition
<p>Introduced species</p> <p>Note:</p> <p>'Introduced' has the same meaning herein as 'alien', 'invasive', 'exotic' and 'pest'</p>	<p>Any species of plant, animal or micro-organism not indigenous to Barrow Island and marine environs whose presence there is due to intentional or accidental introduction as a result of human activity.</p> <p>Notes:</p> <p>(i) Includes individuals from genetically-distinct populations of the same species that occur on Barrow Island (see definition of 'species').</p> <p>(ii) Includes species introduced to Australia as a result of human activity (e.g. buffel grass) that may arrive on Barrow Island by natural means.</p> <p>(iii) Does not include the natural turnover of species between Barrow Island and mainland Australia, where some indigenous species may invade and others become locally extinct.</p>
<p>Introduction (quarantine context)</p>	<p>The arrival of non-indigenous species at Barrow Island via a pathway (e.g. cargo, vessels, personnel). Introduction is an outcome of infection at steps along a pathway.</p>
<p>Joint Risk (spill context)</p>	<p>The overall risk of exposure if a hydrocarbon release occurs and is a product of the 'primary' and 'secondary' risks. It is the likelihood that if a release occurs, it will reach an area of potential significance.</p>
<p>Karst</p>	<p>A region composed of limestone or dolomite and characterised by underground drainage systems, sinkholes and gorges.</p>
<p>L<sub>90</sub> OR LA<sub>90</sub></p>	<p>The ambient (or existing background) noise level present 90% of the time.</p>
<p>Lifecycle Assessment</p>	<p>Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its functional life.</p>
<p>Likelihood (risk assessment context)</p>	<p>Used as a qualitative description of probability or frequency of occurrence.</p>
<p>Liquid Knockout Stream</p>	<p>A gas stream containing a mist of liquids that can be separated in a vessel to make a gas stream without liquid droplets; and a liquid stream without gas bubbles. This is the liquid stream from such a separation which is common place upstream of fuel gas consumers and compressors which cannot be contaminated with liquid droplets.</p>
<p>Lithophagid</p>	<p>Marine bivalve mollusc which lives attached to solid objects, particularly in the intertidal zone.</p>
<p>Littoral Intertidal</p>	<p>Area periodically inundated and exposed during maximum tidal range.</p>
<p>Locus</p>	<p>The place at which a particular gene resides on DNA or a genetic map.</p>
<p>Macroalgae</p>	<p>Large algae commonly referred to as 'seaweed'.</p>
<p>Macrophyte</p>	<p>Broad-leafed aquatic plants visible to the naked eye. A term used to distinguish larger aquatic plants from microscopic algae.</p>
<p>Mangal</p>	<p>A mangrove forest.</p>
<p>Marine Nature Reserves</p>	<p>Marine Nature Reserves are set aside for the conservation and restoration of the natural environment, the protection care and study of indigenous flora and fauna, and the preservation of any feature of archaeological, historic or scientific interest. Only low-impact recreation may be permitted and this only providing it does not adversely affect ecosystems.</p>
<p>Marine Parks</p>	<p>Marine Parks allow for recreation that is consistent with conservation and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest.</p>
<p>Meiofauna</p>	<p>Fauna in the size range of 50 µm to 500 µm.</p>
<p>Melitid</p>	<p>Amphipod crustacean belonging to the family Melitidae.</p>
<p>Mesocavern</p>	<p>Includes all cavities in rock that are smaller than 20 cm in diameter and larger than 0.1 cm in diameter. Not large enough to be considered a cave.</p>
<p>Migratory Species (EPBC Act)</p>	<p>The entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries (Bonn Convention).</p>
<p>Mitigation Measures</p>	<p>Action(s) taken to minimise or lessen impact of activity on the environment or surrounding communities.</p>

Glossary	
Term	Definition
Moribund Organisms	Organisms that have died.
Multiplier Effect	<p>Analysis of national economies often uses 'multipliers' to describe the structural relationships between demand for goods and/or services and the associated impacts on industry output, employment, income and imports. Some industries are more labour intensive than others, just as some produce higher income jobs, others need more imports as inputs to production, and others generate more tax revenue. The same value of demand will have different effects in different industries. The use of multipliers can describe the dynamic nature of relationships between sectors and is used to predict how changes in demand will affect the overall economy, a particular commodity or sector of the economy.</p> <p>Multipliers can be created to show direct or 'first round' effects and indirect or 'second round' effects of increased demand. First round effects show the relationship between demand and the immediate suppliers of that demand. Second round effects include the flow-on effects as those suppliers seek additional inputs to their production in order to service this demand.</p>
National Environment Protection Measure	A legal instrument which sets agreed national objectives for protecting particular aspects of the environment.
Nature Reserves	Nature Reserves are set aside for the conservation and restoration of the natural environment, the protection, care and study of indigenous flora and fauna, and the preservation of any feature of archaeological, historic or scientific interest. Only low-impact recreation may be permitted, and providing that it does not adversely affect ecosystems (Western Australian Department of Conservation and Land Management (CALM)). Class 'A' is used where there is a perceived need for the highest form of protection.
Net Conservation Benefits	Means demonstrable and sustainable additions to, or improvements in, biodiversity conservation values of Western Australia targeting, where possible, the biodiversity conservation values affected or occurring in similar bioregions to Barrow Island.
NO <sub>x</sub>	<p>NO<sub>x</sub> is the generic term for a group of reactive gases, all of which contain nitrogen and oxygen in varying amounts. Many of the nitrogen oxides are colourless and odourless. However, one common pollutant, nitrogen dioxide (NO<sub>2</sub>) along with particles in the air can often be seen as a reddish-brown layer over many urban areas.</p> <p>Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NO<sub>x</sub> are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels.</p>
Octocorals	Soft corals, sea pens and sea fans. Distinguished by polyps having eight branched tentacles.
Offsets	Actions taken outside the Development area to 'compensate' for environmental impacts within the Development site that relate directly to the conservation values affected by the Development.
Oniscid	Isopod crustacean belonging to the family Oniscidae.
Ozone-Depleting Substance(s) (ODS)	A compound that contributes to stratospheric ozone depletion. ODS include CFCs, HCFCs, halons, methyl bromide, carbon tetrachloride and methyl chloroform. Generally very stable in the troposphere and only degrade under intense ultraviolet light in the stratosphere. When ODS break down, they release chlorine or bromine atoms, which then deplete ozone.
Pathway	A route of exposure which might enable non-indigenous species to be introduced to a native environment outside of their natural range.
Pelagic	Relating to the open water in the upper and middle depths of the sea.
Permeability	Capacity of a material to transmit fluids.
Phaeophytes	Brown seaweed: a marine alga that has chlorophyll masked by brown pigment.
Pig	A tool inserted into a pipeline and carried by the gas flow for cleaning or integrity inspection.
Population	A geographically or socially distinct group of interacting organisms of the same species that occupy a definable area.
Post-border (quarantine context)	Quarantine management activities which occur after cargoes, vessels or people have passed the point of entry to Barrow Island. Post-border activities include monitoring, response and contingencies to detect and eradicate any non-indigenous species that are accidentally introduced to Barrow Island.

## Glossary

Term	Definition
Pre-border (quarantine context)	Quarantine activities and barriers which occur prior to the arrival of cargoes, vessels or people at the Barrow Island border. Pre-border quarantine barriers are pathway specific.
Primary Risk (spill context)	The potential of an accidental hydrocarbon release occurring from a pipeline, refuelling accident or a marine vessel collision or grounding.
Priority Flora Species	Priority Species as listed by the Western Australian Department of Conservation and Land Management (CALM).
Protozoan	Single-celled organisms in the Kingdom Protista.
Pupillid Species	Species of snails within the family Pupillidae.
Quarantine Incident	Any event that results in, or has the potential to result in, an incursion.
Quarantine Management System	A set of measures designed to prevent the introduction and/or the establishment of introduced species.  These measures address the guidelines of ISO 14001 for environmental management systems.
RAMSAR Convention	The Convention on Wetlands of International Importance, especially as Waterfowl Habitat.
Rare Flora	Protected species under the <i>Wildlife Conservation Act 1950 (WA)</i> that are considered to be in danger of extinction, rare or otherwise in need of special protection.
Receptor (risk assessment context)	An ecological entity exposed to a stressor. For the purposes of assessing and managing quarantine risk, any species, community or habitat which may respond to, or be vulnerable to the introduction of an introduced species.
Reservoir CO <sub>2</sub>	Carbon dioxide that occurs naturally within a natural gas reservoir.
Resident (species)	A permanent, non-migratory species.
Residual Risk (risk assessment context)	The remaining level of risk after management/treatment measures have been taken into account.
Reverse Osmosis	Water purified by forcing it, under pressure, through a membrane which is impermeable to impurities (salt).
Risk Analysis	A systematic use of available information to determine how often specified events may occur (likelihood) and the magnitude of their consequences.
Risk	The chance of something happening that will have an impact on objectives. Risk is measured in terms of 'consequence' and 'likelihood'. Consequence refers to the outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain. There may be a range of possible outcomes associated with an event. Likelihood is a qualitative description of probability or frequency.
Risk Assessment	The overall process of risk analysis and risk evaluation.
Risk Identification	The process of determining what can happen, why and how. This definition from AS/NZS 4360 is considered the same as 'hazard identification' in other references.
Risk Management	The culture, processes and structures that are directed towards effective management of potential opportunities and adverse effects.
Samphire Flats	An area of land generally in saline conditions (salt pans or areas near the ocean) that contain succulent species of plants which are adapted to/able to tolerate the saline conditions.
Sand Cay	Low sandy island.
Scleractinian	Stony coral.
Secondary Risk (spill context)	The probability of any released hydrocarbon reaching a shoreline or environmentally sensitive area.
Secure Population	A population of a species that currently is not threatened.
Short Range Endemics	Taxonomic groups of invertebrates with naturally small distributions (less than 10 000 km <sup>2</sup> ).
Single Containment Tank	Single containment tanks typically feature a primary liquid containment open-top inner-tank, a carbon steel primary vapour containing outer tank and an earthen dike for secondary liquid containment.

Glossary	
Term	Definition
Slugcatcher	A vessel or series of pipes designed to collect and separate liquids from gas. It is especially important in pipelines where a wave of liquid could damage downstream equipment; such a wave is also called a slug.
Social Characteristics	Social characteristics are those that reflect the demographic, cultural, health, recreational, heritage, visual and lifestyle values and attributes.
Stabilised	A term often used in relation to condensate, where the lighter components have been removed from the liquid stream such that they do not evaporate.
Stereotropism	See Thigmotropism
Stressor (risk assessment context)	A physical, chemical or biological entity that induces an adverse response.
Stygobites	Obligate groundwater-dwelling fauna.
Stygofauna	Aquatic subterranean fauna that inhabit cavities and interstices (small or narrow spaces) in groundwater-filled karst.
Sublittoral	The area below datum, or below the littoral (intertidal) zone.
Subsea Tree	A subsea system of valves and fittings assembled on the sea bed above the gas well to control the flow of hydrocarbons and other fluids.
Supralittoral	Relating to the part above the littoral zone where sea spray dominates the air and where ocean tides do not normally reach.
Supratidal Zone	The tidal zone that is infrequently inundated.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Swale	Linear depression caused by wind erosion.
Taxon/Taxa	Any of the groups into which living organisms are formally classified.
Thalli	Most marine red algae have soft and delicate bodies, or thalli (pl.). A flattened body is referred to as a thallus. Coralline algae have thalli that become strongly calcified and contribute significantly to the growth of coral reefs in tropical seas.
Thigmotactism	The tendency of many small organisms to be attracted to objects.
Thigmotropism	Directional growth in response to the stimulus of direct contact.
Threatened Species (EPBC Act)	A species is considered 'Threatened' if it falls under one of the following categories: extinct, extinct in the wild, critically endangered, endangered, vulnerable, or conservation significant.
Tortuosity (CO <sub>2</sub> injection context)	A measure of how complex the migration path (in this case the migration path for the injected CO <sub>2</sub> ) is through a particular reservoir: the more complex the migration path, the greater the ability for the CO <sub>2</sub> to become trapped.
Troglofauna	Terrestrial subterranean fauna that inhabit air-filled caves, cavities or interstices in the karst above the watertable.
Umbilical Bundle	In subsea applications, a group of electric cables, hoses, and tubes, either on their own or in combination with each other, cabled together for flexibility and over-sheathed and/or armoured for mechanical strength.
Uncertainty (risk assessment context)	A lack of knowledge arising from changes that are difficult to predict or events whose likelihood and consequences cannot be predicted accurately.
Vagrant (species)	Individuals of a species which, by natural means, move from one geographical region to another outside their usual range, or away from usual migratory routes, and which do not establish a population in the new region.
Vegetation Community	A distinct group of plants that grow in a given area, at a given time.
Vermiform	Worm-type body organisation.
Visual Adsorption Capability	A measure of the relative ability of a landscape character type to absorb visual change.

## Glossary

Term	Definition
Voucher Specimen	Any specimen, consisting of an individual animal, or part of an animal, that serves as a basis of study and is retained as a reference.
Vulnerable Species (EPBC Act)	A native species is considered 'Vulnerable' if it is not critically endangered or endangered and it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with prescribed EPBC Act criteria.
World-class	State-of-the-art processes, facilities or methods of operation.
World Health Organisation	United Nations specialised agency for health established in 1948. WHO's objective, as set out in its Constitution, is the attainment by all peoples of the highest possible level of health. Health is defined in WHO's Constitution as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.
Zooxanthellae	A form of algae that lives symbiotically in the tissue of corals and other animals and provides some of the coral's food supply by photosynthesis.

## Unit Conversion Factors

Property	From	To	Multiply By
Mass	kg	lb	2.2046
	Tonne (metric)	UK (ton)	0.9842
Length	m	ft	3.2808
	mm	in	0.03937
Area	m <sup>2</sup>	ft <sup>2</sup>	10.7639
	mm <sup>2</sup>	in <sup>2</sup>	0.001550
	hectare	acre	2.4710
Volume	m <sup>3</sup>	ft <sup>3</sup>	35.3147
	m <sup>3</sup>	BBL	6.29
	litre	gal (US)	0.26417
Molar	m <sup>3</sup> (st)	nm <sup>3</sup>	0.946
	nm <sup>3</sup>	scf	37.3
	kg-mole	nm <sup>3</sup>	22.4
	kg-mole	scf	836.6
Flow	kg-mole/hr	std ft <sup>3</sup> /hr (60°F, 14.696 psi)	836.6
	m <sup>3</sup> /hr	BBL/day	151
	kg/sec	tonne/day	86.4
Force	kN	UK ton force	0.10036
Pressure	kPa	bar	0.010
	bar	psi	14.504
	kPa	psi	0.14504
Energy	kJ	BTU	0.94782
Power	kW	hp	1.3410
Temperature	°C	°F	1.8 + 32
Heating Value	MJ/nm <sup>3</sup>	BTU/scf	25.4
Time	second	hour	3600
	hour	day	24.0
	day	year	365.25



# Acronyms & Abbreviations

AAD	Australian Antarctic Division
ABARE	Australian Bureau of Agriculture and Resource Economics
ABS	Australian Bureau of Statistics
AE	Access Economics
AEC/NHMRC	Australian Environment Council/National Health and Medical Research Council
AGA	Australian Gas Association
AGO	Australian Greenhouse Office
AHD	Australian Height Datum
AIMS	Australian Institute of Marine Science
AIP	Australian Industry Participation
AIPP	Australian Industry Participation Policy
ALARP	As Low As Reasonably Practicable
ALOP	Appropriate Level of Protection
AMC	Australian Marine Complex
a-MDEA	Accelerated-Methyl Diethanolamine
AMEEF	Australian Minerals and Energy Environment Foundation
AMSA	Australian Marine Science Association
AMSA	Australian Maritime Safety Authority
ANZECC/ARMANZ	Australian and New Zealand Environment and Conservation Council/Agriculture and Resource Management Council of Australia and New Zealand
APCI	Air Products and Chemicals, Inc.
APCRC	Australian Petroleum Co-operative Research Centre
APIA	Australian Pipeline Industry Association
APPEA	Australian Petroleum Production and Exploration Association
AQIS	Australian Quarantine Inspection Service
AS	Australian Standards
ASBU	Australasia Strategic Business Unit (Chevron Australia)
AS/NZS	Australian/New Zealand Standard
ATSIC	Aboriginal and Torres Strait Islander Commission
AUSLIG	Australian Land Information Group (now called GeoScience Australia)
ABWMAC	Australian Ballast Water Management Advisory Council
BaSO <sub>4</sub>	Barium Sulphate
bbl	Barrel
BEC	Business Enterprise Centre (Karratha)
BICC	Barrow Island Coordination Council
BLEVE	Boiling Liquid Expanding Vapour Explosion
BOD	Biological Oxygen Demand
BOP	Blow-out Preventer
BP	Before Present (1950)
Bpd	Barrels per day
BPP	Benthic Primary Producer
BPPH	Benthic Primary Producer Habitats
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
BWDSS	Ballast Water Decision Support System
C	Celsius
CaCO <sub>3</sub>	Calcium Carbonate

CALM	Department of Conservation Land Management (WA)
CAMBA	China Australia Migratory Birds Agreement
CAPEX	Capital Expenditure
CASA	Civil Aviation Safety Authority
CEMP	Construction Environmental Management Plan
CH <sub>4</sub>	Methane
CHMP	Cultural Heritage Management Plan
CIEP	Chevron International Exploration and Production
CNG	Compressed Natural Gas
CNOOC	China National Offshore Oil Company
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> CRC	Cooperative Research Centre for Greenhouse Gas Technologies
CO <sub>2</sub> e	Carbon Dioxide Equivalents
COD	Chemical Oxygen Demand
CPDEP	Chevron Project Development and Execution Process
CPI	Consumer Price Index
CPUE	Catch Per Unit Effort
CRA	Corrosion Resistant Alloy
CRIMP	CSIRO Centre for Research on Introduced Marine Pests
CRM	Cultural Resource Management
CS	Carbon Steel
CS1	Compressor Station 1
CSD	Cutter Suction Dredge
CSIRO	Commonwealth Scientific Industrial Research Organisation
CTGG (now CGG)	ChevronTexaco Global Gas (now Chevron Global Gas)
CTOP (now CIEP)	ChevronTexaco Overseas Petroleum
Cwlth	Commonwealth (jurisdiction for legislation)
dB (A)	decibel
dB re $\mu$ Pa	Sound pressure expressed as decibels relative to one micro pascal
DBNGP	Dampier to Bunbury Natural Gas Pipeline
DEH	Department of the Environment and Heritage (Cwlth)
DEP	Department of Environmental Protection (WA) (now DoE – see below)
DIA	Department of Indigenous Affairs (WA)
DLN	Dry, Low NO <sub>x</sub> (burners)
DMA	Decision Making Authority
DME	Dimethyl/Ether
DNA	Deoxyribonucleic acid
DNV	<i>Det Norske Veritas</i>
DoE	Department of Environment (WA)
DoIR	Department of Industry and Resources (WA)
DOMGAS	Domestic gas
DP	Dynamic Positioning
DSDMP	Dredging and Spoil Disposal Management Plan
E	East
EA	Environment Australia
EFDC	Environmental Fluid Dynamics Code

EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EIS/ERMP	Environmental Impact Statement/Environmental Review and Management Programme
EMIP	Environmental Management Implementation Plan
EMP	Environmental Management Plan
EMS	Environmental Management System
ENM	Environmental Noise Model
EP	Environmental Plan
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP(SD) Act	<i>Environmental Protection (Sea Dumping) Act 1982 (Cwlth)</i>
EPA	Environmental Protection Authority (WA)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
EPCM	Employment Procurement Contract Management
ERMP	Environmental Review and Management Programme
ESE Review	Environmental, Social and Economic Review
ESU	Evolutionary Significant Unit
FAO	Food and Agriculture Organisation
FEED	Front-End Engineering and Design
FESA	Fire and Emergency Services Authority of Western Australia
FIFO	Fly-in Fly-out
FTE	Full Time Equivalent
GCEP	Global Climate and Energy Project
GDP	Gross Domestic Product
GEODISC	Australian Petroleum Co-operative Research Centre Research Program on the Geological Disposal of Carbon Dioxide
GES	Generator Efficiency Standards
GHG	Greenhouse Gas
GIS	Geographic Information System
GJ	Gigajoule
GJV	Gorgon Joint Venturers
GPF	Gas Processing Facility
GPS	Global Positioning System
GRE	Glass Reinforced Epoxy
GSP	Gross State Product
GST	Goods and Services Tax (Australia)
GTL	Gas-to-Liquids
H <sub>2</sub> S	Hydrogen sulphide
ha	Hectare
HAZID	Hazard Identification
HAZOP	Hazard and Operability Study
HDD	Horizontal Directional Drilling
HES	Health, Environment and Safety
HESMS	Health, Environment and Safety Management System
HIR	Hydrate Inhibitor Recovery
hp	Horsepower
HVAC	Heating, Ventilation and Air Conditioning

Hz	Hertz
ICN WA	Industry Capability Network (Western Australia)
IFC	International Finance Corporation
IFO	Incident Free Operations
ILUA	Indigenous Land Use Agreement
IMCRA	Interim Marine and Coastal Regionalisation for Australia
IMEA	Infection Modes and Effects Analysis
IMO	International Maritime Organisation
IR	Industrial Relations
ISO	International Standardisation Organisation
ISRC	Independent Scientific Review Committee
ISSG	Species Survival Commission's Invasive Species Specialist Group
IUCN	International Union for the Conservation of Nature
JAMBA	Japan Australia Migratory Birds Agreement
JHA	Job Hazard Analysis
JP	Justice of the Peace
JT	Joule-Thompson
KDCCI	Karratha and Districts Chamber of Commerce and Industry
kg	Kilogram
kg/m <sup>3</sup>	Kilogram per cubic metre
kHz	Kilohertz
km	Kilometre
kPa	Kilopascal
kW	Kilowatt
L	Litre
LEDs	Light Emitting Diode(s)
LGA	Local Government Authority
LNG	Liquefied Natural Gas
LOC	Loss of Containment
LPG	Liquefied Petroleum Gas
m	Metre
m <sup>3</sup>	Cubic metre
m <sup>3</sup> (st)/s	Cubic metre per second (at standard conditions of pressure and temperature)
MARPOL	International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978
MCHE	Main Cryogenic Heat Exchanger
MDEA	Methyldiethanolamine
MEG	Mono Ethylene Glycol
MEPA	Mobil Exploration and Producing Australia Pty Ltd
mg/L	Milligrams per litre
M	Earthquake magnitude on the Richter scale
ML	MegaLitre
MLA	Member of Legislative Assembly, Western Australian Parliament
MLC	Member of Legislative Council, Western Australian Parliament
mm	Millimetre
MMscfd	Millions of standard cubic feet per day (gas)

Mm <sup>3</sup>	Million metres cubed
MOF	Materials Offloading Facility
Mol %	Molar percent (for a gas equivalent to volume percent)
MOU	Memorandum of Understanding
MP	Member of Parliament
MPa	Megapascal
MPR	Department of Mineral and Petroleum Resources of Western Australia, now the Department of Industry and Resources (DoIR)
MPRSWG	Marine Parks and Reserves Selection Working Group
MRET	Mandatory Renewable Energy Target
ms	manuscript name (when appears after a species name)
MSDS	Material Safety Data Sheets
MSP	Management System Process
MSV	Multiple Support Vessel
MTPA	Million Tonnes per Annum
MW	Mega Watt
N	North
N	Nitrogen Compounds
N/A	Not Applicable
N <sub>2</sub>	Nitrogen
N <sub>2</sub> O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards (USEPA)
NaCl	Sodium Chloride
NADF	Non-Aqueous Drilling Fluids
NATPLAN	National Plan to Combat Oil Pollution of the Sea by Oil and Other Noxious and Hazardous Substances
NAWC	North American West Coast
NCB	Net Conservation Benefits
NEPM	National Environment Protection Measurement
NES	National Environmental Significance
NGLs	Natural Gas Liquids
NGO	Non-government Organisation
nm	nanometre
NIMPIS	National Introduced Marine Pest Information System
NIS	Non-Indigenous Species
NOHSC	National Occupational Health and Safety Commission
NOPSA	National Offshore Petroleum Safety Authority
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
NPC	Net Present Cost
NPV	Net Present Value
NSW	New South Wales
NWS	North West Shelf
NWSJV	North West Shelf Joint Venture
O <sub>2</sub>	Oxygen
O <sub>3</sub>	Ozone
OD	Outside Diameter (pipe)

ODS	Ozone Depleting Substances
OE	Operational Excellence
OEMP	Operational Environmental Management Plan
OEMS	Operational Excellence Management System
OiW	Oil in Water
OPEX	Operating Expenditure
OPMF	Onslow Prawn Managed Fishery
OSCP	Oil Spill Contingency Plan
OSH	Occupational Safety and Health
PBA	Preliminary Barrier Analysis
PDC	Pilbara Development Commission
pH	A measure of acidity (7 is neutral), 1 is very acidic and 13 is very alkaline)
PHA	Preliminary Hazard Analysis
PHE	Preliminary Hazard Evaluation
PJ	Petajoule
PLEM	Pipeline End Manifold
PM10	Particulate Matter (less than 10 microns in diameter)
PNTS	Pilbara Native Title Service
ppb	parts per billion
ppm	parts per million
ppmv	Parts Per Million by Volume
PRPP	Pilbara Regional Priority Plan
PRRT	Petroleum Resource Rent Tax
Psi	Pounds per Square Inch (pressure)
P(SL)A	<i>Petroleum (Submerged Lands) Act 1967</i>
Q	Quarter of an Australian Financial Year
QEP	Quarantine Expert Panel
QHAZ	Quarantine Hazard
QMP	Quarantine Management Plan
QMS	Quarantine Management System
QRA	Quarantine Risk Assessment
R&D	Research and Development
RCEP	Royal Commission on Environmental Pollution
RECs	Renewable Energy Certificates
RHIB	Rigid Hull Inflatable Boat
RISC	Resource Investment Strategy Consultants
ROV	Remotely Operated Vehicle
S	South
SACS	Saline Aquifer CO <sub>2</sub> Storage Project
SAP	Sample Analysis Plan
SBM	Single Buoy Mooring
SCC/SCFA	Joint Standing Committee on Conservation/Standing Committee on Fisheries and Aquaculture
SCP	Stakeholder Consultation Program
SCR	Selective Catalytic Reduction
SCSSV	Surface Controlled Subsurface Safety Valve
SEIA	Social and Economic Impact Assessment

SES	Social, Economic and Strategic
SES	State Emergency Service
SI	<i>Systeme Internationale</i> (International System of Units)
SIAC	Standing Interagency Committee of Chief Executive Officers
SIMP	Social Impact Management Plan
SO <sub>2</sub>	Sulphur Dioxide
SO <sub>x</sub>	Sulphur Oxides
SPA	Sales and Purchase Agreement
SrSO <sub>4</sub>	Strontium Sulphate
SSV	Subsurface Safety Valve
STP	Standard Temperature and Pressure
SWATH	Small Waterplane Area Twin Hull
TAFE	Technical and Further Education
TBC	To Be Confirmed
TBD	To Be Determined
TBT	Tributyltin
Tcf	Trillion cubic feet
TDS	Total Dissolved Solids
TECs	Threatened Ecological Communities
TEG	Triethylene glycol
TJ	Terajoule
Tm <sup>3</sup>	Trillion cubic metres
tpa	tonnes per annum
TPS	Town Planning Scheme (Shire of Roebourne)
TSHD	Trailer Suction Hopper Dredges
TSS	Total Suspended Solids
UNCLOS	United Nations Convention on the Law of the Sea
UNFCCC	United Nations Framework Convention on Climate Change
USA (the US)	United States of America (the United States)
USDA	US Department of Agriculture
USEPA	United States Environmental Protection Agency
VIP	Value Improving Practice (Chevron)
VOCs	Volatile Organic Compounds
Vol %	Volume percent
VRS	Vendor Registration System (supply-base)
W	West
W	Watt
WA	Western Australia
WAERA	Western Australian Energy Research Alliance
WAM	Western Australian Museum
WAPET	West Australian Petroleum Proprietary Limited
WCED	World Commission on Environment and Development
WHO	World Health Organisation
WSF	Water Soluble Fraction
XOV	Cross Over Value



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# General Appendix A



## Policy 530 – Protecting People and the Environment

It is the policy of Chevron Corporation to protect the safety and health of people and the environment.

### Scope

Consistent with our Corporate values and our goal to be recognized and admired for safety, health, and environmental excellence, we conduct our business worldwide in a socially responsible and ethical manner.

**Leadership** at all levels will foster a culture for HES excellence by assuring alignment of vision, expectations, and behavior drivers, including accountability. Systematic management of HES matters is required to achieve and sustain excellence in all of our operations.

We will assess and manage risks to our employees, contractors, the public and the environment within the framework of the following principles and expectations:

**Safe & Incident-Free Operations** – Design, construct, operate, maintain and ultimately decommission our assets to prevent injury, illness and incidents.

**Advocacy** – Work ethically and constructively to influence proposed laws and regulations, and the debate on emerging issues.

**Compliance Assurance** – Verify conformity with company policy and government regulations. Ensure that employees and contractors understand their safety, health and environmental responsibilities.

**Conservation** – Conserve company and natural resources by continually improving our processes and measuring our progress.

**Product Stewardship** – Manage potential risks of our products with everyone involved throughout the products' life cycles.

**Pollution Prevention** – Continually improve our processes to minimize pollution and waste.

**Property Transfer** – Assess and manage our environmental liabilities prior to any property transaction.

**Community Outreach** – Reach out to the community and engage in open dialogue to build trust.

**Emergency Management** – Prevention is a first priority, but be prepared for any emergency and mitigate any incident quickly and effectively.

These expectations, and our standard approach to managing them, are further explained in the documentation for the Operational Excellence Management System (OEMS).



# General Appendix B

Key Commitments			
General			
Commitment Number	Commitment (Action)	Timing	Advice From*
1.1	The Gorgon Joint Venturers will implement an Environmental Management System (EMS), which is consistent with the recognised international standard AS/NZS ISO 14001:2004, Environmental Management Systems – Specification with Guidance for Use (ISO 14001).	Ongoing	
1.2	A series of Environmental Management Plans (EMPs) will be developed and documented through a systematic and consultative process according to an agreed timetable with the EPA and DEH, taking into consideration comments on the Draft EIS/ERMP and recommendations from relevant agencies.	Prior to construction of the relevant Development component	Various DMAs
1.3	The Gorgon Joint Venturers will share the use of key infrastructure and services on Barrow Island, whether a part of the existing Barrow Island operation or developed as part of the Gorgon Development in accordance with the Barrow Island State Agreement.	Ongoing	
1.4	Further environmental surveys will be undertaken prior to the commencement of construction to finalise selection of alternatives or preferred routes and/or locations and the survey results provided to CALM. These environmental surveys will include: <ul style="list-style-type: none"> <li>• the flora of the proposed optical fibre cable route</li> <li>• flora and fauna in the CO<sub>2</sub> injection seismic monitoring area</li> <li>• vegetation communities containing <i>Acacia synchronicia</i> to the north of the existing airstrip</li> <li>• avifauna along the proposed domestic gas pipeline route</li> <li>• the distribution of shorebird habitats near the mainland shore crossings</li> <li>• the inter-nesting or hibernating flatback turtles at Town Point.</li> </ul>	Prior to construction of the relevant Development component	CALM
1.5	A detailed Decommissioning Assessment and Plan reflecting industry best practice, including completion criteria, will be prepared and submitted 6 months prior to decommissioning to identify the best overall outcome.	At least 6 months prior to decommissioning	Various DMAs
1.6	Once gas processing operations have ended, the facility will be decommissioned and the equipment removed from site; and the land rehabilitated to a condition which is consistent with the surrounding environment.	Decommissioning	

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

Key Commitments			
Clearing & Earthworks			
Environmental Management Objective/s:			
<ul style="list-style-type: none"> <li>To maintain the abundance, diversity, geographic distribution and productivity of flora and fauna through the avoidance or management of adverse impacts and improvement in knowledge.</li> <li>To protect EPBC Act listed threatened species, migratory species and Threatened Ecological Communities (TECs).</li> <li>To protect Specially Protected (Threatened) Fauna consistent with the provisions of the <i>Wildlife Conservation Act 1950</i>.</li> <li>To protect evolutionary significant units, including genetic races on Barrow Island.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
2.1	Gas processing facilities, associated infrastructure and the CO <sub>2</sub> monitoring grid and injection wells will be located to preferentially use previously disturbed areas and limit the disturbance to that required for safe construction and operation.	During design, construction and operations	CALM, DoIR
2.2	Further survey work during the detailed engineering phase will be undertaken to assist with final alignments of the CO <sub>2</sub> monitoring grid and preparation of Environmental Management Plans, which will be undertaken to the satisfaction of the EPA and DEH.	During design and prior to construction	
2.3	Disturbance to important fauna habitats, listed fauna species, restricted flora and vegetation communities will be avoided where practicable.	During design, construction and operations	CALM
2.4	Significant fauna, such as bettongs, will be translocated from the Development area to alternative locations on Barrow Island in consultation with CALM.	During construction	CALM
2.5	No new quarries or borrow pits outside of the construction site will be created to support the Development on Barrow Island.	Construction and operations	
2.6	Site specific rehabilitation procedures including completion criteria will be developed and implemented in consultation with the relevant authorities for areas that are no longer required for operations or future works.	Prior to rehabilitation	CALM, DoIR
2.7	Rehabilitation of works sites and access roads will be undertaken to a condition consistent with the surrounding landscape.	Ongoing	

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

## Key Commitments

### Fire & Emergency Response

#### Environmental Management Objectives:

- To ensure that there is no adverse effect on environment values or the health, welfare and amenity of people and land uses.
- To maintain the abundance, diversity, geographic distribution and productivity of flora and fauna through the avoidance or management of adverse impacts and improvement in knowledge.
- To protect EPBC Act listed threatened species, migratory species and Threatened Ecological Communities (TECs).
- To protect Specially Protected (Threatened) Fauna consistent with the provisions of the *Wildlife Conservation Act 1950*.
- To protect evolutionary significant units, including genetic races on Barrow Island.

Commitment Number	Commitment (Action)	Timing	Advice From*
3.1	An Emergency Management Plan that includes integrated safety and emergency response systems will be prepared and implemented in consultation with the relevant authorities and neighbouring industry participants.	Prior to construction of the relevant Development component and then ongoing	FESA, CALM and local Shire
3.2	In the event that a fire is started as a result of the Development, then immediate corrective action will be taken to extinguish or contain the fire and its occurrence will be reported to relevant authorities.	Ongoing	CALM
3.3	The Gorgon Joint Venturers will participate in a research program, managed by CALM, on the ecological effects of fire regimes on Barrow Island.	Ongoing	CALM

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

Key Commitments			
CO <sub>2</sub> Injection			
Environmental Management Objective:			
<ul style="list-style-type: none"> <li>To ensure that atmospheric emissions do not adversely affect environment values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
4.1	The Gorgon Joint Venturers will significantly reduce Development CO <sub>2</sub> emissions by injecting the reservoir CO <sub>2</sub> removed during the gas processing operations into the Dupuy Formation, provided it is technically feasible and not cost prohibitive.	During operations	DoIR
4.2	In the unlikely event that it should prove technically infeasible or cost prohibitive to inject the proposed volume of CO <sub>2</sub> , the Gorgon Joint Venturers will consult with government with the intent of maximising the injection of CO <sub>2</sub> within the commercial constraints of the Gorgon Development.	Ongoing	DoIR
4.3	A CO <sub>2</sub> Injection Operations Management Plan will be prepared with the objective of maximising the volume of reservoir CO <sub>2</sub> injected whilst ensuring that the injection does not pose an unacceptable health, safety or environmental risk.	Prior to commissioning	DoIR
4.4	If at any time the Gorgon Joint Venturers consider that the injection of reservoir CO <sub>2</sub> represents an unacceptable risk to the environmental values of Barrow Island, or a safety risk, then the CO <sub>2</sub> injection operation will be suspended until such time as all risks are addressed.	During operations	DoIR
4.5	Appropriate arrangements will be made with the Barrow Island Joint Venture to ensure that all wells in the path of the migrating CO <sub>2</sub> are assessed and if required, worked over such that they are fit for service in a CO <sub>2</sub> environment.	During operations	DoIR
4.6	A CO <sub>2</sub> Monitoring Program will be prepared, implemented and reviewed in consultation with the relevant authorities.	Prior to commissioning and then ongoing	DoIR

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

<b>Key Commitments</b>			
<b>Atmospheric &amp; Greenhouse Gas Emissions</b>			
<b>Environmental Management Objective:</b>			
<ul style="list-style-type: none"> <li>To ensure that atmospheric emissions do not adversely affect environment values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.</li> </ul>			
<b>Commitment Number</b>	<b>Commitment (Action)</b>	<b>Timing</b>	<b>Advice From*</b>
5.1	The Gorgon Joint Venturers undertake to report on and manage greenhouse gas emissions from the Gorgon Development in accordance with the Gorgon Development Greenhouse Gas Management Plan. This plan includes a series of longer term greenhouse gas emission performance targets to be used to guide the further reduction of greenhouse gas emissions.	During operations	
5.2	The Gorgon Joint Venturers will continue to participate in government programs aimed at the voluntary reduction of greenhouse gas emissions.	Ongoing	
5.3	Energy efficiency studies will be undertaken during the detailed engineering and design of the Development.	During design	
5.4	The Development will be designed based on a 'no routine flaring' policy and will incorporate a high efficiency flare to reduce the portion of uncombusted hydrocarbon and particulates to as low as reasonably practicable (ALARP). A small flare is required to be in continuous service for safety and maintenance purposes.	During design and operation	
5.6	The Development will be designed and operated to reduce venting of process hydrocarbons.	Operations	
5.7	A monitoring program of key emission sources and types will be developed and implemented in agreement with the DoE.	Prior to commissioning and during operations	

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

<b>Key Commitments</b>			
<b>Liquid, Solid &amp; Hazardous Waste</b>			
<b>Environmental Management Objectives:</b>			
<ul style="list-style-type: none"> <li>• To ensure that liquid and solid wastes do not adversely affect groundwater or surface water quality or lead to soil contamination.</li> <li>• To ensure that hazardous materials are handled and stored in a manner that minimises the potential impact on the environment through leaks, spills and emergency situations.</li> <li>• To ensure that there is no adverse effect on environment values or the health, welfare and amenity of people and land uses.</li> </ul>			
<b>Commitment Number</b>	<b>Commitment (Action)</b>	<b>Timing</b>	<b>Advice From*</b>
6.1	A Waste Management Plan will be prepared and implemented for hazardous and non-hazardous wastes in consultation with the DoE and will include systems and details for individual waste streams and their disposal.	Prior to construction of the relevant Development component and then ongoing	Local Shire, DoIR
6.2	The Waste Management Plan will be based on the principles of eliminate, reduce, re-use, recycle, treatment and environmentally responsible disposal.	During design, construction and operations	
6.3	Solid waste will not be disposed of on Barrow Island, with the exception of waste concrete where it may be used by the existing oilfield operation.	Ongoing	CALM
6.4	A Hydrotest Water Management Plan will be prepared and implemented.	During design and commissioning	

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

Key Commitments			
Leaks & Spills			
Environmental Management Objectives:			
<ul style="list-style-type: none"> <li>To ensure that hydrocarbons and hazardous materials are handled and stored in a manner that minimises the potential impact on the environment through leaks, spills and emergency situations.</li> <li>To maintain the ecological functions and environmental values of marine benthic habitats and the subtidal and intertidal zones.</li> <li>To maintain the ecological function, abundance, species diversity and geographic distribution of mangrove, coral, seagrass and other benthic primary producer communities and their habitats.</li> <li>To ensure that any impacts on locally significant marine communities are avoided, minimised and/or mitigated.</li> <li>To protect EPBC Act listed threatened, migratory species and Threatened Ecological Communities (TECs).</li> <li>To protect Specially Protected (Threatened) Fauna consistent with the provisions of the <i>Wildlife Conservation Act 1950</i>.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
7.1	Spills and leaks will be contained, recorded and affected sites remediated.	During construction and operation	CALM, DoIR & Dept of Transport
7.2	Copies of Material Safety Data Sheets (MSDS) for all chemicals will be held on site and all materials managed (handled, stored and disposed of) accordingly.	Ongoing	
7.3	An Oil & Chemical Spill Contingency Plan (OCSCP) including emergency response measures will be prepared, implemented and reviewed in consultation with the relevant authorities.	Prior to construction of the relevant Development component and then ongoing	CALM, DoIR & Dept of Transport
7.4	Spill recovery and cleanup equipment will be provided and maintained at key marine and terrestrial locations as identified in the agreed OCSCP.	Ongoing	
7.5	Navigational exclusion zones will be created around seabed infrastructure to prevent accidental damage to facilities and local pilots will be used to berth ships.	During construction and operations	AMSA, Dept of Transport
7.6	Installed equipment will be designed and operated to prevent spills and leaks through the provision of in-built safeguards such as relief valves, overflow protection, and automatic and manual shut-down systems.	During design, construction and operations	

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Key Commitments			
Noise & Vibration			
Environmental Management Objectives:			
<ul style="list-style-type: none"> <li>To avoid adverse noise and vibration impacts to fauna.</li> <li>To ensure that noise impacts emanating from the proposed gas processing facility comply with statutory requirements specified in the <i>Environmental Protection (Noise) Regulations 1997</i>.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
8.1	An Environmental Management Plan for CO <sub>2</sub> monitoring with seismic will be prepared to the satisfaction of the EPA and implemented.	Prior to commencing seismic surveys	CALM, DoIR
8.2	An Environmental Plan for offshore seismic activities will be prepared to the satisfaction of DoIR and implemented.	Prior to commencing offshore seismic surveys	DoIR
8.3	Blasting will be scheduled for daylight hours to avoid activity peaks of nocturnal mammals.	During construction	CALM

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

Key Commitments			
Light & Temperature			
<b>Environmental Management Objectives:</b> <ul style="list-style-type: none"> <li>To avoid or manage potential impacts from light overspill and shade and comply with acceptable standards.</li> <li>To maintain the abundance, species diversity, geographic distribution and ecological functions of marine faunal communities.</li> <li>To ensure that any impacts on locally significant marine communities are avoided, minimised and/or mitigated.</li> <li>To protect EPBC Act listed threatened, migratory species and Threatened Ecological Communities (TECs).</li> <li>To protect Specially Protected (Threatened) Fauna consistent with the provisions of the <i>Wildlife Conservation Act 1950</i>.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
9.1	<p>The following key lighting strategies will be employed:</p> <ul style="list-style-type: none"> <li>The main gas processing facility shall be designed such that no permanently on-lighting is located within 500 m of turtle nesting beaches.</li> <li>Use red/yellow/orange type of reduced spectrum light, such as sodium vapour as the primary lighting for the facility.</li> <li>Use shielded white type lights in areas that require inspection during operator rounds and/or regular maintenance. These lights will be switched off when not required.</li> </ul>	During design, construction and operation	CALM
9.2	Lighting levels will be reduced to those required for safe working and security; and, in areas where colour definition is not critical for safety or operational purposes, shielded red or mono-chromatic lights will be utilised.	During design, construction and operation	
9.3	Areas where land fauna may come into contact with extreme or hazardous temperatures, will be fenced or selectively cleared in consultation with the CALM to provide a suitable buffer.	During construction and operation	CALM

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<b>Key Commitments</b>			
<b>Physical Disturbance &amp; Interaction (See also – Clearing &amp; Earthworks)</b>			
<b>Environmental Management Objectives:</b>			
<ul style="list-style-type: none"> <li>To protect EPBC Act listed threatened, migratory species and Threatened Ecological Communities (TECs).</li> <li>To protect Specially Protected (Threatened) Fauna consistent with the provisions of the <i>Wildlife Conservation Act 1950</i>.</li> <li>To maintain the abundance, species diversity, geographic distribution and ecological functions of marine faunal communities and ensure that any impacts on locally significant marine communities are avoided, minimised and/or mitigated.</li> <li>To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystems levels through the avoidance or management of adverse impacts and improvement in knowledge.</li> <li>To protect evolutionary significant units, including genetic races on Barrow Island.</li> </ul>			
<b>Commitment Number</b>	<b>Commitment (Action)</b>	<b>Timing</b>	<b>Advice From*</b>
10.1	A Dredging and Spoil Disposal Management Plan (DSDMP) will be prepared in consultation with the relevant authorities to the satisfaction of EPA and DEH, and implemented.	Prior to commencement of dredging and then ongoing	Marine and Harbours
10.2	To reduce dredge spoil disposal volumes, material will be assessed for use in the construction of the causeway and the MOF.	During construction	
10.3	Shore crossing activities will be managed to reduce impacts during the peak turtle nesting period.	During construction	CALM
10.4	Shore crossing disturbance areas will be rehabilitated to a condition consistent with the surrounding landscape.	During construction	CALM, DoIR
10.5	A Marine Anchoring Management Plan will be prepared and implemented in consultation with the relevant authorities.	Prior to construction of the relevant Development component and then ongoing	CALM, DoIR and Dept of Transport
10.6	Programs will be established to encourage and foster environmental awareness and conservation with the workforce.	Ongoing	

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Key Commitments			
Quarantine			
Environmental Management Objective:			
<ul style="list-style-type: none"> <li>To prevent the introduction and establishment of non-indigenous species to Barrow Island and its surrounding waters.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
11.1	The Gorgon Joint Venturers will develop the Quarantine Management System in consultation with the relevant authorities to the satisfaction of the EPA and DEH, and implement the system.	Prior to construction and then ongoing	CALM
11.2	The Gorgon Joint Venturers will prepare, implement and periodically review specific quarantine management procedures for all pathways.	Ongoing	
11.3	Monitoring and eradication including incident response and reporting will be undertaken in accordance with the agreed Quarantine Management System.	Ongoing	
11.4	An expert Quarantine Advisory Group will be established to provide advice on quarantine management.	Prior to construction	CALM
11.5	Ballast water management practices will be audited by the Gorgon Joint Venturers to verify conformance with domestic and international regulations.	Ongoing	Dept of Transport
11.6	Targeted flora and fauna surveys will be undertaken to determine baseline data that will be used to judge the effectiveness of quarantine barriers.	Prior to construction	CALM

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Key Commitments			
Cultural Heritage & Native Title			
<b>Management Objectives:</b>			
<ul style="list-style-type: none"> <li>To ensure the cultural and heritage values on and around Barrow Island are not compromised by the Development.</li> <li>To ensure that all works are performed in accordance with the <i>Aboriginal Heritage Act 1972</i>, <i>Heritage of Western Australia Act 1990</i> and <i>Maritime Archaeology Act 1973</i>.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
12.1	Undertake archaeological and ethnographic surveys within the Development area in consultation with the identified Indigenous communities.	Prior to construction of the relevant Development component	DIA
12.2	Prior to construction all proposed ground disturbance areas (including the seabed) will be reviewed for indigenous, historical and maritime cultural heritage evidence.	Prior to construction of the relevant Development component	DIA, WA Museum, Maritime Museum, Heritage Council
12.3	The Development will be managed in accordance with a Cultural Heritage Management Plan, which will be prepared in consultation with the relevant authorities.	Prior to construction of the relevant Development component and during operations	DIA, WA Museum, Maritime Museum, Heritage Council
12.4	The Joint Venturers will undertake consultation and negotiations with indigenous Native Title claimants in relation to mainland activities such as the domestic gas pipeline and optical fibre cable.	Prior to construction of the relevant Development component	DIA, DoIR and Office of NT
12.5	If cultural heritage sites cannot be avoided, the relevant authorities will be consulted and management measures agreed.	Prior to construction of the relevant Development component	

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

Key Commitments			
Social			
<b>Management Objective:</b>			
<ul style="list-style-type: none"> <li>To ensure that there is no adverse effect on the health, welfare and amenity of the workforce or public.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
13.1	A Social Impact Management Plan will be prepared in consultation with relevant stakeholders.	Prior to construction	Key stakeholders
13.2	Where necessary, Traffic Management Plans will be prepared in consultation with the relevant authorities prior to the movement of non-standard construction equipment, machinery or vehicles on public roads.	During construction	MRWA, Police and Local Shires
13.3	Significant navigational changes or constraints due to construction and operating conditions will be communicated to mariners and commercial fishing operators.	During construction and operations	Dept of Transport
Health & Safety			
<b>Management Objective:</b>			
<ul style="list-style-type: none"> <li>To ensure that there is no adverse effect on the health, welfare and amenity of the workforce or public.</li> </ul>			
Commitment Number	Commitment (Action)	Timing	Advice From*
14.1	Comprehensive Safety Management Systems and Plans will be prepared in consultation with the relevant authorities.	Prior to construction of the relevant Development component	DoIR, WorkSafe, and NOPSA
14.2	Emergency evacuation procedures will be established in consultation with the relevant authorities to remove injured personnel off Barrow Island to suitable medical facility.	Prior to construction of the relevant Development component	FESA and local Shire
14.3	Medical personnel will be located on Barrow Island throughout construction and operations.	Ongoing	
14.4	Regular inspections of the Development by company safety professionals will be conducted throughout construction and operations.	Ongoing	DoIR, WorkSafe, and NOPSA
14.5	Appropriate recreational opportunities and facilities will be provided within the construction village.	During construction	

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.

Key Commitments			
Auditing, Monitoring & Reporting			
Commitment Number	Commitment (Action)	Timing	Advice From*
15.1	A comprehensive Environmental Monitoring Program will be established, implemented and periodically reviewed in consultation with the relevant authorities and will be used to guide ongoing management and corrective action. Specific localised monitoring activities will be included within the EMPs.	Ongoing	CCWA, CALM, DoIR, WA Museum, DIA, Health WA
15.2	An Environmental Audit Program will be established and implemented in consultation with DoE and DEH to determine whether the Development meets environmental objectives, proponent commitments and requirements of the Development's EMS and EMPs. The program will be used to guide ongoing management and corrective action.	Prior to construction of the relevant Development component and then ongoing	
15.3	A Barrow Island land use register will be established and maintained to track all clearing and rehabilitation activities associated with the Development and included in the Annual Environmental Report to authorities.	Prior to construction and then ongoing	
15.4	The status and progress of key environmental issues will be included in the public Annual Environmental Report.	During construction and operations	

\* In addition to DoE and DEH, third parties that have particular expertise and/or statutory responsibility relevant to implementing these commitments are included in the column entitled Advice From.





