1 Project objectives and background

This introductory chapter provides the background to the proposed development of the M2 area of the Ord River Irrigation Area Stage 2 (the Project). The chapter includes information on the co-proponents for the environmental assessment of the proposed development, Wesfarmers–Marubeni and the Water Corporation of Western Australia. The history of development of the Ord River Irrigation Scheme is provided together with a brief overview of the scope and timing of the proposed development. The chapter includes a discussion of the regulatory framework that would govern the Project and the environmental impact assessment process. It also includes a brief discussion on the world's sugar markets, the consequences of not proceeding with the Project, and an outline of the scope and structure of this report.

1.1 THE EXISTING ORD RIVER IRRIGATION SCHEME

1.1.1 History of development

Basic research into irrigated agriculture in the East Kimberley began in 1941 when the Government of Western Australia established a small experimental farm on the banks of the Ord River, near to the off-take for the present main irrigation (M1) channel. This farm was abandoned in 1945 in favour of the Kimberley Research Station, which was developed on the Ivanhoe Plain as a joint Commonwealth–State venture.

Results of successful crop trials with rice, cotton, safflower, flax and sugarcane convinced the Western Australian Government that an irrigation scheme on the Ord River would be viable. Development of the Ord River Irrigation Scheme was planned to proceed in two stages. Ord River Irrigation Area Stage 1 (ORIA Stage 1) of the development was completed by 1966: this involved construction of the Kununurra Diversion Dam to form Lake Kununurra, as well as irrigation infrastructure and associated works, and the township of Kununurra (Figure 1.1). The cost then was about $20 million, with the Commonwealth Government contributing $12 million. By this time, thirty-one farms had been allocated on the Ivanhoe Plain, all irrigated from Lake Kununurra.

The second stage of the Ord River Irrigation Scheme has only been partially completed to date. Completed works include construction of the Ord River Dam—about 50 km upstream from Kununurra—to provide a major storage reservoir called Lake Argyle, at a cost of $22 million. This dam was officially opened in 1972. A further 2,000 ha of land were also developed in 1974 on the Packsaddle Plain as part of Stage 2. About 14,000 ha are currently developed as irrigated farms.

Water is supplied to Lake Kununurra from Lake Argyle, with some of this flow being via a hydroelectric power station. From Lake Kununurra, irrigation water is mainly gravity fed to the farming areas, with some pumped supply to Packsaddle Plain and small areas of black soil, sand and levee soil. The Water Corporation is responsible for operating and maintaining the dams on the Ord River and the water distribution and drainage system.

In 1994 the height of the spillway in the Ord River Dam was raised as part of the works associated with installation of the hydroelectric power station. The storage capacity of the Ord River Dam is sufficient not only to supply the water requirements for all of the potential irrigation areas at a level of security better than 98%, but also to allow for the release of water to maintain environmental values in the Ord River downstream of Lake Kununurra (Chapter 5 refers).

1.1.2 Existing development

Existing developments that comprise the Ord River Irrigation Scheme include the following major components:

- irrigated agricultural land on the Ivanhoe Plain and the Packsaddle Plain;
- the Kununurra Diversion Dam on the Ord River that forms Lake Kununurra;
- the Ord River Dam that forms Lake Argyle;
- the township of Kununurra.

Irrigated farmland

A gross area of 14,000 ha of land has been developed for irrigated agriculture on the Ivanhoe Plain and the Packsaddle Plain. About 11,500 ha of this area is currently cropped, with the balance devoted to irrigation, drainage, access and farm infrastructure. Agricultural activities include broad-acre cropping of the cracking clay (black soil) areas with sugarcane, chick pea, pasture, melons and seed crops, and tree crops such as bananas and mangoes on lighter textured loam and sandy soils.

Both areas draw their irrigation water from Lake Kununurra via open channels with an overall length greater than 134 km. The Packsaddle Plain areas require some pumping of the irrigation water while the Ivanhoe Plain area is gravity fed via a system of channels, including the M1 Channel. A network of about 155 km of open channels collects drainage waters from both areas for discharge to the Ord River, downstream of the Kununurra Diversion Dam. Part of the Packsaddle Plain drains to the Dunham River, a tributary of the Ord River.

Early development of ORIA Stage 1 was beset with problems associated with control of pests and poor farm economics, mainly due to the remoteness of the area. Current farming activities have benefited from the experience gained during the difficult early years to the extent that they are now profitable. As a consequence there is now a strong demand for developed irrigation farmland in the region.

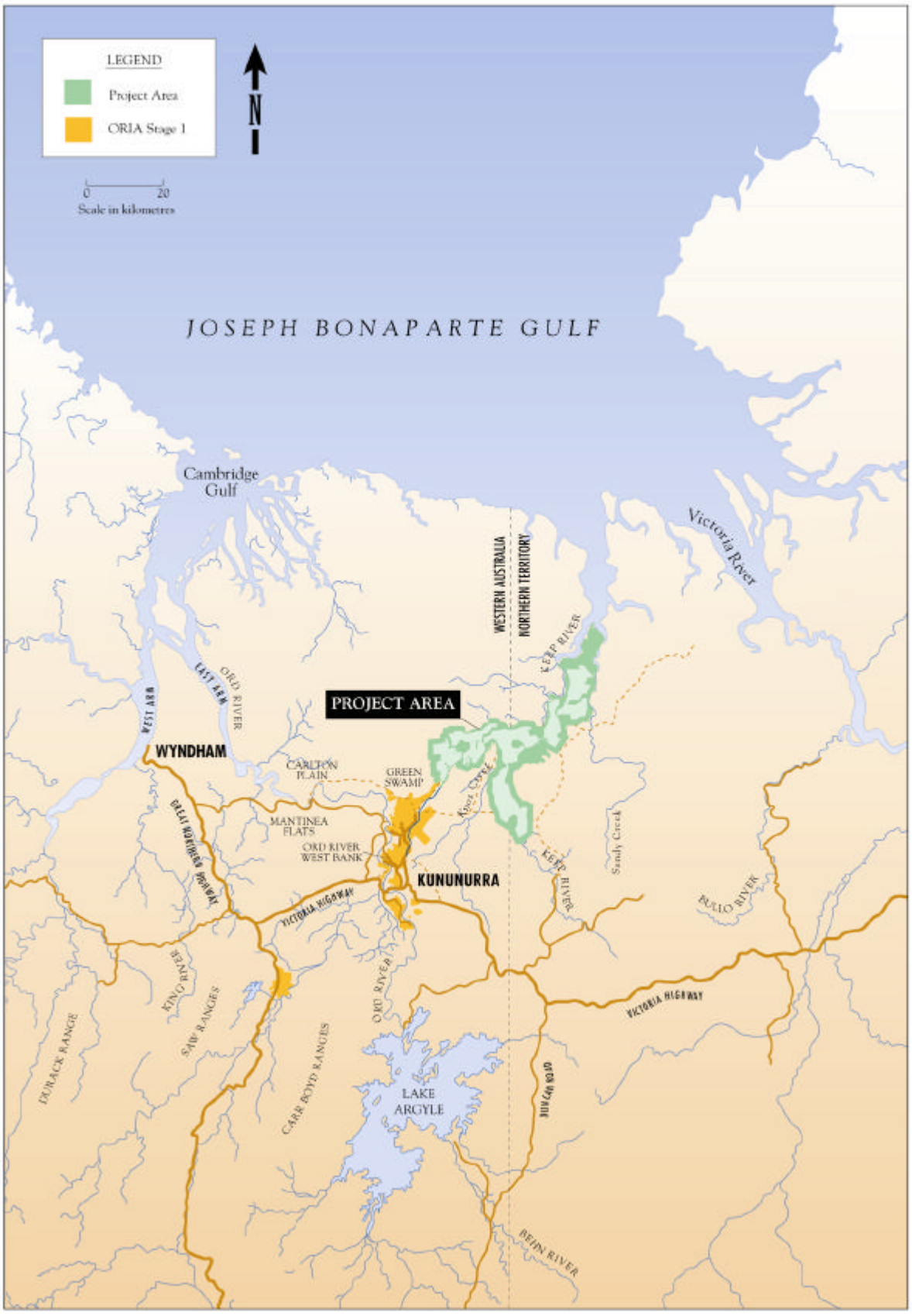


Figure 1.1 Overview of Ord Region and Project Area

Kununurra Diversion Dam

The purpose of the Kununurra Diversion Dam is to maintain water levels in Lake Kununurra sufficient to irrigate the existing ORIA Stage 1 areas and possible future irrigation areas on the Weaber, Keep River and Knox Creek plains. The Diversion Dam consists of a long concrete spillway with earth and rockfill embankments on each side. The spillway is a broad concrete sill keyed into the natural rock foundation. Set on top of the sill is a series of vertical piers between which are located large radial gates. The gates provide the barrier against which the water is stored. When required, they can be opened to allow the wet season floods to pass, or to release water to farmers drawing their supplies from the river downstream of the Diversion Dam. Spanning the Diversion Dam is a highway bridge, which provides all-weather road access across the Ord River.

Ord River Dam

The Ord River Dam, located some 50 km upstream of the Kununurra Diversion Dam, forms Lake Argyle, the principal water storage of the Ord River Irrigation Scheme. The water of this lake is also used for:

- generation of power in a 30 MW hydroelectric power station owned and operated by Ord Hydro Pty Ltd. This power is reticulated north to Kununurra and Wyndham and south to the Argyle Diamond Mine;
- commercial fishing based mainly upon netting of catfish species. A small barramundi fish-farming operation is also based on Lake Argyle, and Fisheries Western Australia (Fisheries) is currently investigating further development of fish-farming based upon this species;
- process and potable water (following treatment) at the Argyle Diamond Mine;
- tourism, recreation and the maintenance of environmental values in Lake Kununurra and the lower reaches of the Ord River.

Kununurra township

Kununurra is the regional centre for local, State and Commonwealth Government departments. Consequently, a relatively large proportion of the town's labour force is employed in the community services and public administration sectors.

Over the past ten years, the number of businesses in Kununurra has grown steadily. In particular, there has been an increase in the number of smaller specialist stores, supermarkets have been established, and the number of industries servicing the agricultural and tourism sector has grown.

1.1.3 Potential for expansion

Despite the completion of the Ord River Dam in 1972, the Ord River Irrigation Scheme has not yet been developed to fulfil its full potential. This, in the past, has been due to view held by the private sector and Government that projected economic returns from the full development of the Ord River Irrigation Scheme may not justify the significant investment that would be required. In recent years, the successful cultivation in the Ord River Irrigation Scheme of broadacre crops such as sugarcane, has resulted in a revisit of the opportunities to extend the Ord River Irrigation Scheme.

Completion of ORIA Stage 1 would involve the development of land at Green Location. The proposed Stage 2 developments include extensive areas of black soil on the Weaber, Keep River and Knox Creek plains, and development of land at Carlton Plain, Mantinea Flats and on the Ord River West Bank.

The development of irrigation farmland on the Weaber, Keep River and Knox Creek plains would require the development of a purpose-built irrigation channel from the existing water supply at Lake Kununurra. The proposed channel is known as the M2 Channel, and the area to be served by the channel as the M2 Development Area.

Irrigation water to serve proposed farm development at Carlton Plain, Mantinea Flats, Mantinea Loop and on the Ord River West Bank would be obtained by pumping from the Ord River downstream of Lake Kununurra. The aforementioned developments are known as the Riverside Developments.

This proposal refers only to the development area that would be served by the M2 Channel. The Riverside Developments and Green Swamp would be subject to separate environmental impact assessments by other proponents.

1.1.4 Development preliminaries

In 1994, the Western Australian Government committed to investigation of the extension of the Ord River Irrigation Scheme so that the scheme would fulfill its full potential.

As part of the proposed scheme lies within the Northern Territory, agreement was reached between the Western Australian and Northern Territory Governments to develop the whole scheme. Agreement between the Governments was reached in 1995, and the vision of the Governments with respect to the proposed extensions to the scheme was stated as follows (Government of Western Australia and Government of the Northern Territory, 1997):

'The ORIA Stage 2 project will be developed to its full potential as quickly as possible in a manner that ensures long term economic and environmental sustainability. Net benefits to the local community, the State of Western Australia, the Northern Territory and Australia will be maximised by attracting the early involvement of competent commercial interests with established reputations, and by those involved adopting an open and communicative approach with all interested parties as the development proceeds.'

The key objectives of the Western Australian and Northern Territory Governments with respect to the development are as follows:

- maximise sustainable production and economic returns through the most efficient use of the available suitable irrigation land and water resources;
- maximise the involvement of private commercial interests in the development;
- adopt land release and pricing plans that accommodate a variety of land demands while maintaining economic viability of the proposed land uses;
- establish an environmental management framework prior to the commencement of developments, aiming to carefully monitor and manage any changes and minimise adverse environmental impacts;
- resolve native title and Aboriginal heritage issues equitably and without excessive delay;

- communicate openly and effectively during the course of development to retain consistent community support for the project;
- strive for maximum regional economic benefits.

Throughout 1995 and 1996, the Governments commissioned various preliminary studies in relation to the proposed development of Ord Stage 2, with a view to calling for registrations of interest from the private sector. Results from the preliminary studies proved sufficiently attractive for the Governments to call for private sector Registrations of Interest (1996) and Expressions of Interests (1997). One of the studies commissioned by the Governments was a draft Public Environmental Review (Section 1.4.2 refers).

The call for expressions of interest resulted in the submission of a number of detailed proposals from local and overseas-based organisations. In 1998, a joint venture between Wesfarmers Sugar Company Pty Ltd (Wesfarmers) and Marubeni Corporation (Marubeni) was awarded an exclusive mandate by the Governments to investigate the feasibility of development of the M2 Development Area for the purposes of broadacre irrigation (Sections 1.3.2 and 1.3.3 refer). The heart of the Wesfarmers–Marubeni Project proposal is the development of a world scale sugar industry (Section 1.2 refers).

Development of irrigation infrastructure would be an integral component of the proposed development. The Water Corporation of Western Australian (Water Corporation) is investigating the feasibility of development of the irrigation infrastructure, in parallel with the feasibility study being conducted by Wesfarmers–Marubeni (Section 1.3.4 refers).

Due to the importance of water related issues to the environment, and due to the integrated nature of the proposed sugar industry and the irrigation infrastructure, Wesfarmers–Marubeni and the Water Corporation have agreed to have a single and joint environmental assessment undertaken of the proposed development.

1.2 THE PROJECT

1.2.1 Project overview

The scope of this report involves the potential development of an export-based raw-sugar industry—the Project. Australia is currently one of the world's largest exporters of raw sugar, and at full development the Project would contribute an additional indicative 10% to the current national exports of raw sugar.

Key features of the Project are:

- development of approximately 32,000 hectares of irrigable land in the Project Area consisting of sugarcane plantation development by Wesfarmers–Marubeni of approximately 29,000 ha and the sale of approximately 3,000 hectares of land by Wesfarmers–Marubeni to independent farmers on an unconditional basis with respect to the types of crops that may be grown. The commitments made in this report would also apply to this land;
- the development of a raw-sugar mill by Wesfarmers–Marubeni with a capacity of approximately 400,000 t/a of raw sugar and 160,000 t/a of molasses;
- the development by Wesfarmers–Marubeni of raw sugar and molasses storage and handling facilities at Wyndham port;

- the development of irrigation, drainage and flood protection infrastructure by the Water Corporation;
- establishment and on-going management of over 40,000 ha of additional land in the Project Area for conservation purposes.

The Project is described in more detail in Chapter 3.

Following development, the Project Area (Figure 1.1) would include land developed for farms and associated infrastructure, and other land managed for conservation. Farm areas would be developed on the heavy clay soils (black soils), while the land managed for conservation would include those areas that contain flora and fauna of conservation significance and other areas that provide a buffer between the farm areas and surrounding land uses. Table 1.1 provides a summary of the proposed land uses within the Project Area, including proportions within Western Australia and the Northern Territory.

Table 1.1 Proposed land uses within the Project Area

	Location		
Land use	Western Australia	Northern Territory	Total
Farm area (ha)*	16,500	15,290	31,790
Infrastructure (ha)*	1,790	1,220	3,010
Conservation (ha)*	16,610	24,350	40,960
Total	**34,900**	**40,860**	**75,760**

* *Rounded to nearest 10 ha.*

At this time, it is anticipated that farm development would be substantially complete by 2003 and cane harvested from all three plains by 2005.

Raw sugar and molasses would be trucked from the mill to storage facilities at Wyndham. Sugar and molasses would be exported, predominantly to Asia, in 20,000 t vessels.

In the start-up phase and early years of operation Wesfarmers–Marubeni would own and operate the sugarcane plantation business. However, over time and as supply of cane with the desired quality attributes becomes well proven, the corporate farm may be gradually subdivided and sold down to independent sugarcane growers.

1.2.2 Products and markets

Sugar: use and markets

Sugar is used extensively as a natural sweetener in food and beverages. Molasses, a by-product of sugar production, is used predominately for the production of alcohol (ethanol) by fermentation and food additives such as mono-sodium glutamate.

World sugar demand in 1998 was approximately 121 Mt, with approximately 38% of this demand arising from Asia.

From 1973 to 1994, the growth in world sugar consumption was 198% pa (International Sugar Organization 1994), and over the same period the average annual world per capita consumption was approximately 20 kg. From 1955 to 1994, the annual average growth rate of sugar consumption exceeded the world population growth rate.

Sugar is traded in two forms: raw (principally in bulk) and white (principally in bags). World trade in 1998 was about 35 Mt, with approximately equal amounts of raw and white sugar.

The world sugar trade is heavily regulated. Mechanisms utilised to protect domestic sugar industries include preferential import quotas in the United States and the European Union, import tariffs and export quotas. In recent years, with the break-up of the Soviet Union and the collapse of communism in Eastern Europe, the quantity of sugar entering the world 'free trade' market has risen. The proportion of sugar entering the world free trade market is expected to increase as a consequence of further increases in trade liberalisation.

Raw-sugar prices have traditionally been volatile, but have stabilised somewhat over recent years (Figure 1.2). Raw sugar prices maintained their real value during the early 1990s.

The oil crises and high inflation of the early 1970s and 1980s contributed to the price peaks in those periods, whilst the relative stability following the early 1980s has been attributed to a higher proportion of freely traded raw sugar and an increased volume of futures trading.

Sugar industry

World sugar production in 1998 was approximately 130 Mt. Production growth (Table 1.2) over the last five years, of around 20 Mt, has been predominantly from Thailand, Brazil and India.

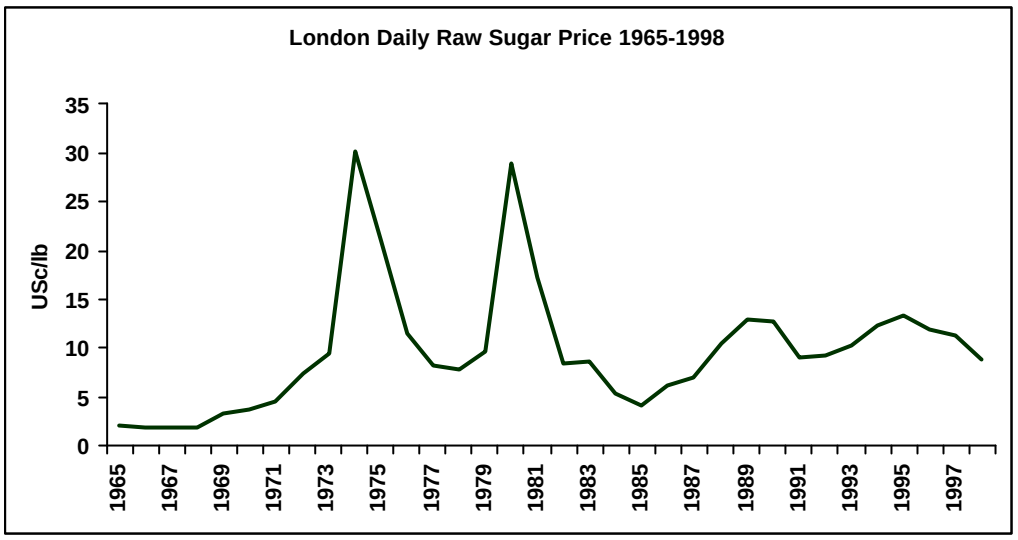
Table 1.2 Regional world sugar production

Region	1994 (Mt)	1998 (Mt)
Africa	7.20	9.10
Central America	11.25	12.90
North America	7.09	7.26
South America	17.95	25.58
Asia	32.89	37.58
Oceania	5.80	5.41
Eastern Europe	8.76	8.17
Western Europe	18.64	20.91
Total	109.58	126.91

Source: LMC International Ltd (1999)

Sugar is produced from sugarcane, predominately in the southern hemisphere, and sugarbeet, predominately in the northern hemisphere. Sugar production is constrained by climate and is of a seasonal nature, whilst demand for sugar is relatively steady throughout the year. As a consequence, inventories of sugar are necessary to satisfy the steady demand. The world sugar inventory at the end of 1998 was estimated at 60 Mt (source: LMC International Ltd, 1999).

Figure 1.2 World sugar prices



Source: LMC International Ltd (1999)

Other crops

Crops other than sugarcane may be grown within the Project Area, on land owned and managed by independent farmers. Therefore, it is possible that any of the range of broad-acre crops currently being grown on the ORIA (Section 2.1 refers) could be grown on the Project Area.

1.3 THE PROPONENTS

1.3.1 Co-proponents

As outlined in Section 1.1.4, Wesfarmers–Marubeni and the Water Corporation have elected to be Co-proponents of the environmental assessment of the proposed development.

The responsibilities of the respective co-proponents for the Project are as follows:

- Wesfarmers–Marubeni: farm development, field and crop preparation and management, access roads, power and communications infrastructure, the raw-sugar mill, and storage and loading facilities at Wyndham Port;
- the Water Corporation: development and management of the irrigation water supply, drainage and flood protection infrastructure.

The rationale for Wesfarmers–Marubeni and the Water Corporation electing to be co-proponents of this environmental assessment lies in the integrated nature the proposed industry and proposed irrigation infrastructure, and the importance that water related issues would have to the environment. The single and joint assessment does, however, allow the environmental management responsibilities of each of the proponents to be separately identified and allocated.

1.3.2 Wesfarmers

Wesfarmers Sugar Company Pty Ltd is a wholly-owned subsidiary of Wesfarmers Limited.

Wesfarmers Limited is a major diversified Australian public company with current net assets in excess of $1 billion and market capitalisation of over $3 billion.

The company's origin in 1914 as a Western Australian farmers' cooperative determined its early focus on the provision of services and merchandise to the rural community. While maintaining this focus, Wesfarmers Limited has undertaken a diversification programme which has resulted in a greatly broadened business and geographical base.

Today, Wesfarmers Limited is a diversified corporation with interests in fertilisers and chemicals manufacture and marketing; gas processing and distribution; coal mining and production; building materials, hardware and forest products; and rural and country services. The rural business interests include merchandising and rural agency activities, transport and insurance services.

Wesfarmers Limited has exhibited the capability to develop and operate projects in a range of new industries and under a range of technical and economic conditions. In many of its project developments Wesfarmers Limited has played an integral role in development, design and project delivery, and in doing so has exhibited the in-house technical capability to deliver and operate complex projects. Successful environmental management has been fundamental to project delivery.

Wesfarmers Limited has significant exposure to primary production through its tree-farming operations in the south-west of Western Australia. The company has developed approximately 40,000 ha of *Eucalyptus globulus* plantations since 1981, the current development rate being about 5,000 ha/a. Expertise for the development of tree plantations has been developed in-house to a point where the company's skills are recognised by independent operators, and its services are contracted out to private plantation developers around Australia.

Wesfarmers Limited is familiar with the unique conditions that apply to development and operations of businesses in the Kimberley region. The harsh climatic conditions and geographic isolation demand perseverance and patience in the operation of local businesses. Wesfarmers Limited, through a 100% subsidiary company, Wesfarmers Transport, has successfully provided transportation services in the Kimberley for many years. More recently, Wesfarmers Transport has developed a sugarcane transportation business servicing ORIA Stage 1 and has established a regional office in Kununurra.

Wesfarmers Limited has a strong commitment to responsible environmental management throughout all company operations. Of the five publically stated group objectives of Wesfarmers Limited, two refer specifically to environmental objectives as follows:

"Wesfarmers aims to:

- respond to the attitudes and expectations of the communities in which it operates and place strong emphasis on achieving sustainable development and protection of the environment;
- provide a fulfilling and safe working environment for employees, to reward good performance and to provide opportunities for advancement."

In January 1999, Wesfarmers Limited released a comprehensive and publically available Environment, Health and Safety Report, which documents performance from a number of the company's operating businesses for 1997/98. It is envisaged that the Report will be prepared on an annual basis in the future.

1.3.3 Marubeni

Marubeni is one of Japan's leading general trading companies. Marubeni operations encompass domestic, import, export and offshore trade, and investment activities, and range from the development of natural resources to the retail marketing of finished products. The company conducts operations through a worldwide business network composed of nearly 200 representative offices and more than 600 affiliated companies in eighty-four countries. Marubeni's trading transactions in 1998–99 were in excess of $US100 billion.

Through its Agri-Marine Products Group, Marubeni is a major world trader of cereals, oilseeds, feed and food materials, foodstuffs and beverages. As part of this business Marubeni has had a long history of sugar trading and currently handles approximately 700,000 t/a of sugar. The Marubeni Sugar Division has offices in New York, London, Bangkok, Tokyo, Manila and São Paulo from which trade is conducted in raw sugar, refined sugar and molasses.

The Machinery Division of Marubeni is active in the development of a wide range of chemical, industrial and power generation plants throughout the world. As part of these operations, Marubeni has played a prominent role in the development of sugar mills and sugar refineries in the Philippines, Venezuela, Indonesia and Morocco.

Marubeni Corporation (Tokyo) has ISO 14001 accreditation for Environmental Management System Standards, in relation to procurement, delivery of services and investments.

1.3.4 The Water Corporation

The Water Corporation was established as a body corporate under the provisions of the *Water Corporation Act 1995* and is the principal water utility for Western Australia. Water, wastewater, drainage and irrigation services are provided under this Act and other legislation controlling the water industry.

The principal functions of the Water Corporation are:

- to acquire, store, treat, distribute, market and otherwise supply water for any purpose;
- to collect, store, treat, market and dispose of wastewater and surplus water;
- to undertake, maintain and operate any works, system, facilities, apparatus or equipment required for any of these purposes;
- to develop and turn to account any technology, software or other intellectual property that relates to any of these functions;
- to manufacture and market any product or by-product that relates to any of these functions;
- to use expertise and resources to provide consultative, advisory or other services for profit.

The Water Corporation has an asset base of $8.5 billion and provides a total water service to a population of over 1.7 million people in urban and rural communities across the 2.5 million km^2 of Western Australia. In providing these services, the Water Corporation employs over 2,000 people on a full-time basis.

In the north-west region, the Water Corporation supplied 23,800 ML of water to over 24,000 properties during 1997–98. In ORIA Stage 1 approximately 260,000ML were supplied for irrigation.

The Water Corporation has undertaken developments that have a strong environmental emphasis such as Waterlink projects at Kwinana and Kalgoorlie, sludge digesters at the Woodman Point Wastewater Treatment Plant, and an oil-from-sludge digester at the Subiaco Wastewater Treatment Plant. The Water Corporation's commitment to the environment was elaborated when it launched its Environmental Policy in September 1997.

1.4 THE APPROVALS PROCESS

1.4.1 Western Australia and the Northern Territory regulatory framework

A Memorandum of Understanding was signed on 19 April 1995 by the Chief Minister of the Northern Territory and the Premier of Western Australia in response to the desire of both their Governments to complete the originally envisaged Ord River Irrigation Scheme. The Memorandum of Understanding provides a framework for sharing information from studies into the scheme and for planning by agencies of the respective Governments and by the private sector.

The Memorandum of Understanding is not intended to create legal relations between the two Governments; neither does it remove the need for compliance with legal requirements by proponents of the development. It is also recognised by both Governments that the Memorandum of Understanding will require further negotiation when and if development proceeds.

The development and operation of the Project must comply with all relevant State, Territory and Commonwealth legislation. Table 1.3 provides a listing of the legislation, treaties and national agreements of particular relevance to the Project. The legislation requires the issuing of licences or approvals prior to the commencement of construction or operation.

1.4.2 The environmental impact assessment procedure

The Governments of Western Australia and the Northern Territory have agreed that the Project should be jointly assessed utilising the Western Australian environmental impact assessment process of the *Environmental Protection Act 1986*. This process is shown diagrammatically in Figure 1.3.

In 1996, the Department for Resources Development (DRD) referred to the Western Australian Environmental Protection Authority (EPA) a proposal to develop the Project Area and were notified that a Public Environmental Review was the appropriate level of assessment. A draft of the Public Environmental Review was prepared, but it was never published.

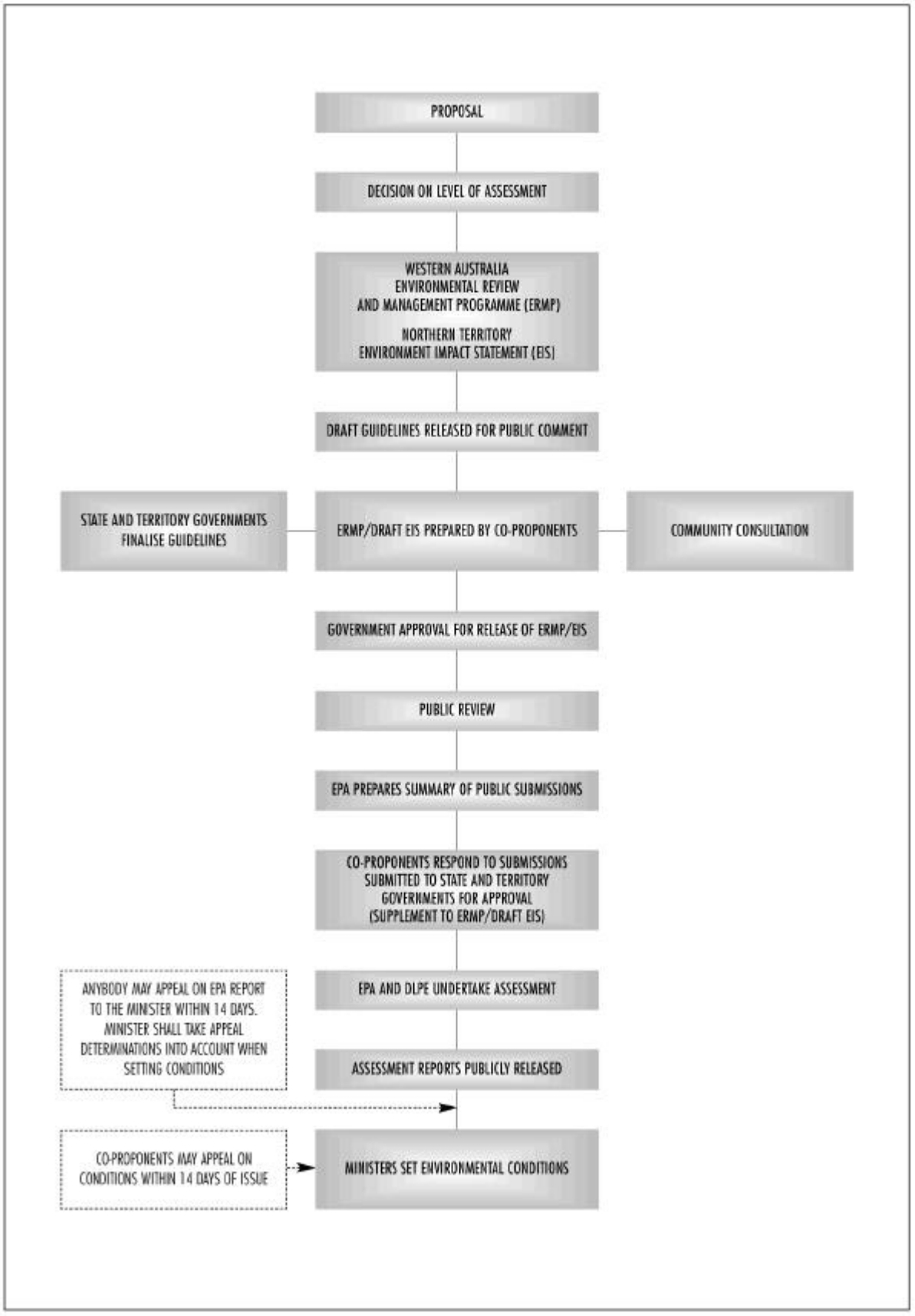


Figure 1.3 Environmental Impact Assessment Process Flow Chart

DRD withdrew its referral when the environmental impact assessment process commenced again with a referral of the Project by Wesfarmers–Marubeni and the Water Corporation to the EPA in September 1998. Following consideration of the referral, the Governments agreed that the assessment should be an Environmental Review and Management Programme (ERMP) in Western Australia and an Environmental Impact Statement (EIS) in the Northern Territory.

A draft set of guidelines for this ERMP/draft EIS was advertised for public comment and remained open for public comment for a period of three weeks until 14 May 1999. The finalised guidelines, released on 19 July 1999, which incorporate changes resulting from the assessment of public comments, are contained in Appendix A.

Table 1.3 Relevant legislation, treaties and agreements

Western Australian legislation	Northern Territory legislation	Commonwealth legislation, international and national agreements or treaties
Aboriginal Heritage Act 1972	*Aboriginal Land Act 1992*	*Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
Aerial Spraying Control Act 1966	*Aboriginal Land Rights (Northern Territory) Act 1976*	*Australian Heritage Commission Act 1985*
Agricultural and Veterinary Chemicals (Western Australia) Act 1995	*Agricultural and Veterinary Chemicals (Northern Territory) Act 1995*	*Environmental Protection (Impact of proposals) Act 1974*
Agriculture Act 1988	*Environmental Assessment Act 1994*	*National Parks and Wildlife Conservation Act 1975*
Conservation and Land Management Act 1984	*Environmental Offences and Penalties Act 1996*	*National Environment Protection Council Act 1994*
Environmental Protection Act 1986	*Control of Roads Act 1996*	*National Environment Protection Measures (Implementation) Act 1998*
Fisheries Resources Management Act 1994	*Fisheries Act 1996*	*Environment Protection and Biodiversity Conservation Act 1999*
Health Act 1911	*Heritage Conservation Act 1996*	*Endangered Species Protection Act 1992*
Heritage of Western Australia Act 1990	*Lands Acquisition Act 1996*	*Native Title Act 1993*
Land Administration Act 1997	*Local Government Act 1996*	Convention on Biological Diversity National Strategy for Ecologically Sustainable Development
Local Government Act 1995	*Northern Territory Aboriginal Sacred Sites Act 1995*	Convention on Wetlands of International Importance especially on Water Fowl Habitat (1975) (The Ramsar Convention)
Main Roads Act 1930	*Noxious Weeds Act 1994*	China–Australia Migratory Bird Agreement (CAMBA), 1988
Rights in Water and Irrigation Act 1914	*Parks and Wildlife Commission Act 1995*	Japan–Australia Migratory Bird Agreement (JAMBA), 1981
Soil and Land Conservation Act 1945	*Pastoral Land Act 1996*	
Town Planning and Development Act 1985	*Plant Diseases Control Act 1996*	
Water Agencies (Powers) Act 1984	*Public Health Act 1995*	
Water Corporation Act 1995	*Soil Conservation and Land Utilization Act 1995*	
Water and Rivers Commission Act 1995	*Territory Parks & Wildlife Conservation Act 1996*	
Water Services Coordination Act 1995	*Water Act 1996*	
Waterways Conservation Act 1976		
Wildlife Conservation Act 1950		

The ERMP/draft EIS is available for comment by the public and by Government departments and agencies for a period of ten weeks. During this time members of the public are invited to forward comments on any aspect of the proposal to the EPA.

The EPA will prepare a summary of the public submissions for comment by theWesfarmers–Marubeni and the Water Corporation. Following receipt of these comments in the form of a Supplement to the ERMP/draft EIS the relevant State and Territory Government departments and agencies will assess the proposal and publish the results in assessment reports.

In Western Australia, the ERMP and subsequent EPA advice will form the legal basis for the Western Australian Minister for the Environment's decision in relation to the proposal. Any approval to implement the proposal would be subject to enforceable environmental conditions, which would also include commitments given by the Wesfarmers–Marubeni and the Water Corporation. In the Northern Territory, the EIS will form the basis for recommendations that the Minister for Lands, Planning and Environment may make to the Northern Territory Cabinet on the proposal.

It should be noted that construction of the Project would not commence until the environmental impact assessment process is complete and the ministerial approvals and conditions have been obtained. Planning and design activities can, however, proceed independently of the environmental impact assessment process.

1.5 CONSEQUENCES OF NOT PROCEEDING WITH THE PROJECT

If the Project does not proceed, there would be some consequences (benefits and disbenefits) for the environment. There would also be consequences for the sugar and molasses industry and for the regional, Western Australian and national economies. These are summarised below.

1.5.1 Environmental consequences of not proceeding

All projects result in some impact to the environment. It is the role of project planners, developers and regulators to ensure that no significant adverse environmental impacts occur, and that any residual impacts are managed and minimised.

This Project involves the use of existing and currently underutilised water source and distribution facilities at Lake Argyle and Lake Kununurra. Hence, the potential for environmental disturbance is less than that for an irrigation project requiring the further damming of rivers. Nevertheless, there would be some environmental benefits, both real and perceived, associated with not proceeding with the Project, and these are outlined below. These benefits should be considered against the significant economic benefits accruing from the Project.

Clearing of vegetation

One of the primary consequences of the Project not proceeding is that some 36,400 ha of existing vegetation, predominantly grassland with scattered low trees found on the black soil plains, would not be cleared. However, the project development plan contains features to mitigate the consequences of vegetation clearing and to ensure maintenance of biodiversity in the region. These features include:

- the provision of dedicated conservation areas within the Project Area. These conservation areas contain vegetation assemblages that are representative of those found in the Project Area, as well as flora and fauna identified as having regional conservation significance;
- the maintenance of riparian vegetation along watercourses and permanent waterbodies;
- the provision of corridors for the movement of fauna, between areas set aside for conservation and the surrounding undeveloped country;
- the active management of all conservation areas and, wherever possible, infrastructure corridors for the purpose of ensuring ecologically sustainable development and maintenance of biodiversity. As a minimum, management of the areas would include removal of stock, control of access, monitoring and control for weeds and introduced species, and monitoring of environmental and ecological parameters.

The Project's Environmental Management Plan (EMP) would contain the detailed provisions to manage all of the Project Area, including areas not developed. It should be noted that the Project Area and the surrounding countryside are currently used for cattle grazing and that no formal management measures currently exist for the protection of the flora and fauna in these areas.

Another consequence of the Project not proceeding is that an opportunity may be lost to add to the conservation estate of Western Australia and the Northern Territory. This opportunity would arise land excisement required from existing pastoral leases, to enable the proposed development to occur. This opportunity could be a significant contribution to fulfilling one of the principles of the National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth of Australia 1996)—the establishment of a comprehensive, representative and adequate system of ecologically viable protected areas integrated with sypathetic management of all other areas, including agricultural and other resource production systems.

The ongoing management proposed for the Project's conservation areas would include research focussed at improving environmental management systems for these areas. The outcomes of this research should be applicable to the broader region, however the research would not occur if the Project does not proceed.

Receiving waters

The Project Area drains predominantly to the Keep River, and to a lesser extent to Sandy Creek, both located in the Northern Territory. Apart from limited development associated with pastoral activities, the catchments of these watercourses are currently undeveloped.

The project development plan recognises the need to preserve the water quality and hydrology of the receiving waters to the maximum extent possible. In particular, all farm blocks would be developed with irrigation tailwater return systems in order to virtually eliminate discharges from farms during the dry season. First-flush stormwater would also be retained by these systems. Stormwater discharges during the wet season would be diluted by flows from surrounding catchments, sufficient to reduce nutrient and pesticide levels to levels consistent with the maintenance of existing environmental values.

Groundwater

Groundwater in the Project Area generally exists at depths greater than 10 m below surface and range in quality from fresh to saline (50,000 mg/L TDS). Development for irrigated farmland would alter the existing equilibria, leading to a rise in groundwater levels. It is known in extreme cases that excessive rises in groundwater levels can lead to water logging and salinisation.

The project development plan includes management measures designed to avoid the adverse impacts outlined above. These management measures include:

- the avoidance of areas shown to be susceptible to rapid groundwater rise;
- the adoption of irrigation water regimes that match plant water requirements, thereby minimising overwatering and accessions to groundwater;
- the implementation of a comprehensive monitoring programme designed to provide early detection of potential problems;
- the implementation where necessary of remediation strategies, including groundwater recovery, using bores or subsurface drains, or a combination of both.

There is a high level of confidence that the above management measures would be successful. However, not proceeding with the Project would prevent the potential risks from arising.

Secondary impacts

There are a number of secondary impacts that would be avoided if the Project did not proceed, including:

- increased visitation of conservation areas, pastoral leases, and areas of significance to Aboriginal people, brought about by increased population and improved regional road networks;
- increases in mosquito-borne infections resulting from an increased population residing in the area.

This report outlines the measures proposed to manage these issues during operations, although both issues are outside the direct responsibility of the co-proponents.

1.5.2 The sugar market

At a potential production rate of 400,000 t/a of raw sugar, the proposed industry would be a relatively large individual producer. However, this output would still only represent a small percentage, about 0.3%, of current world production. As outlined in Section 1.2.2, much of the current sugar production is tied to consumers and a smaller amount, about 35 Mt/a, is traded on the free market. Project production would, therefore, only represent about 1% of the annual trade in sugar.

There are a number of other large projects at varying stages of development throughout the world, many situated in developing countries where environmental legislation and management is not as sophisticated as in Australia. Given that sugar demand growth is maintained, sugar production foregone from the Project would conceivably be replaced by the expansion of existing projects elsewhere, or by the development of new projects.

There are no known alternative sugar projects in Australia at this time of the scale of the proposed development. It is therefore likely that replacement production would be substantially sourced overseas, and the benefits of development lost to Australia.

1.5.3 The State and national economies

The estimated benefits for the regional economy from the Project are substantial and include:

- the creation of up to 650 new jobs at Kununurra during the construction phase;
- the creation of around 800 new permanent jobs during production, including 550 direct jobs at Kununurra;
- an increase in receipts by the State of Western Australia from water sales from the Project during production;
- improved regional infrastructure;
- increased tax revenue for the State of Western Australia, the Northern Territory and the Commonwealth;
- an increase in annual revenue from the export of raw sugar and molasses and a consequent positive annual impact on Australia's balance of trade during production.

Should the Project not proceed, these benefits could be lost to the regional, State and Australian economies, because there are no known alternative developments with the same potential for investment in the region, particularly in a long-term context. In the short to medium term, the Australian economy would lose the opportunity to export a valuable commodity into world markets.

1.6 SCOPE AND STRUCTURE OF THE REPORT

1.6.1 Scope

The scope of this ERMP/draft EIS covers the environmental implications of the Project in response to the ERMP/draft EIS guidelines (Appendix A) issued by the State and Territory Governments.

The ERMP/draft EIS does not visit issues associated with the construction and operation of the existing irrigation scheme (ORIA Stage 1), except to learn from these previous experiences for the purpose of establishing environmental best-practice performance in relation to the proposed development. The ERMP/draft EIS also does not include issues associated with the water resource allocation from the Ord River. Section 5.2 outlines the assessment process being adopted by the State for this issue.

1.6.2 Structure

Two key considerations have shaped the structure of this ERMP/draft EIS: the need to describe the scale and physical characteristics of the Project in the most effective way, and the need to examine those environmental factors that have been identified in the ERMP/draft EIS guidelines and by the co-proponents as being the most relevant in assessing the environmental effects of the proposal.

The existing developments in the ORIA are described in Chapter 2. The physical elements of the Project are described in Chapter 3. Subsequent chapters (Chapters 4 to 15) describe the effects of the Project on the existing environment, with environmental aspects grouped according to their relationship to major elements of the Project (Table 1.4). Chapter 16 describes the environmental management framework proposed for the Project, while a summary of the commitments made in this ERMP/draft EIS is provided in Chapter 17.

Table 1.4 Report structure

Major project element	Environmental considerations	Chapter
Project description	• Existing operations—general	2
	• Future operations—general	3
Biophysical environment	• Physical environment	4
	• Surface hydrology	5
	• Groundwater	6
	• Terrestrial vegetation and flora	7
	• Terrestrial habitats and fauna	8
	• Aquatic flora, fauna and habitats	9
	• Conservation strategy	10
Social environment	• Land use	11
	• Issues specific to Miriuwung and Gajerrong people	12
	• Air quality	13
	• Public health	14
	• Community issues	15
Environmental management	• Management framework	16
	• Summary of environmental commitments	17

The individual chapters discuss the present environment, the potential impact of the Project, and the proposed environmental controls, management systems and procedures. Where appropriate, the assessment method is also described.

Appendix A presents the ERMP/draft EIS guidelines as finalised by the State and Territory Governments following public comment.

Of necessity, this ERMP/draft EIS contains a significant number of technical terms. As these may not be familiar to readers, a glossary has been included as Appendix B. Technical abbreviations used in the document are contained in Appendix C, while references are brought together as Appendix D. The agencies consulted during preparation of this document are listed in Appendix E. Appendix F lists members of the study team. The technical appendices relating to specific chapters are bound separately.