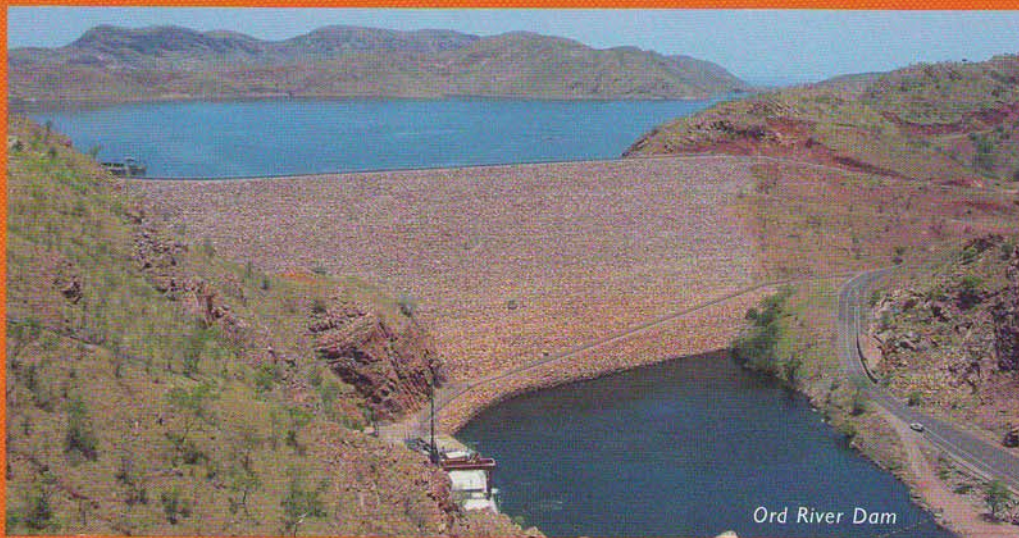


East Kimberley

Ord Irrigation Scheme



Ord River Dam

History of the Ord Irrigation Scheme

With one of the fastest flowing rivers in Australia during the wet season, the rich fertile soils and the Wyndham Port only 100 kilometres away, the East Kimberley boasted all the dynamics for a successful irrigation scheme.

Since their discovery in the early 1880s by Alexander and John Forrest, the fertile alluvial plains of the lower reaches of the Ord River have long lured pastoralists and farmers to the East Kimberley. However, despite the extremely heavy rainfall during the 'wet', the 'dry season' reduced the mighty Ord from a fast-flowing river to a series of waterholes.

Without harnessing the waters there was no chance the area could sustain the cherished dream of an agricultural industry.

It became apparent the only way to transform the semi-desert cattle country to a luscious, year-round agricultural area would be to develop a

vast dam on the Ord River. This would capture much of the 2,500 gegalitres of water that flowed into the ocean each day during the wet season storms (enough water to supply Perth for almost 10 years).

The potential of the Ord was recognised and in 1941, the Western Australian Government established a small experimental farm on the Ord. At the same time engineers investigated possible dam sites upstream. Following this, the Kimberley Research Station (now called the Frank Wise Institute) was established as a joint Commonwealth/State venture on Ivanhoe Plain.



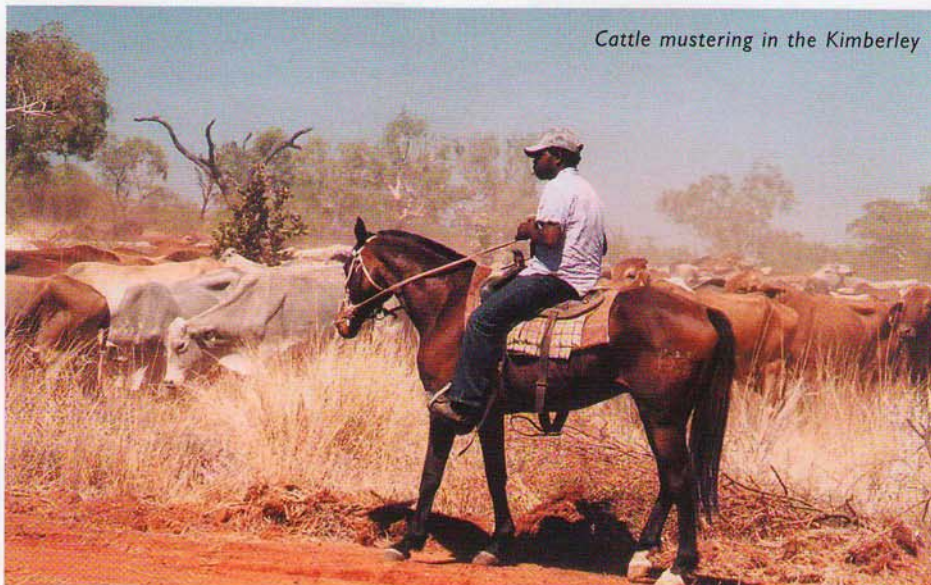
Sugar Cane

Crop trials demonstrated that under irrigation, tobacco, rice, cotton, safflower, linseed, sugar cane, melons, tomatoes, cabbages, cauliflowers, beans, potatoes, maize and millet all grew well.

Encouraged by the results, the Western Australian Government submitted its first proposal in 1949 to the Commonwealth Government for financial assistance to build a dam on the Ord River. This submission and a further approach in 1956 failed to gain the support of the Commonwealth.

However, in 1959 a grant from the Commonwealth Government was finally approved, enabling the Western Australian Government to start work on the massive Ord River Irrigation Scheme.

Cattle mustering in the Kimberley



The development of the Ord Irrigation Scheme



Kununurra in the 1970s

The Ord River Irrigation Scheme is the end result of a bold and imaginative plan to develop part of the nation's tropical north for intensive irrigated agriculture by harnessing the waters of the Ord River.

The construction of the Kununurra Diversion Dam across the Ord River, plus irrigation and associated works was completed in 1963 at a cost of approximately \$20 million (\$270 million in today's value). This development marked the completion of the first stage of the Ord Irrigation Scheme.

This major capital investment also led to the establishment of the town of Kununurra which was built as the service centre for the scheme.

The Kununurra Diversion Dam was built on Bandicoot Bar and was designed to divert water from the Ord River onto the Ivanhoe Plain for irrigation. The Kununurra Diversion Dam comprised 20 radial gates mounted within a concrete framework and spillway structure to cater for fluctuating river levels.

During the wet season the gates open to allow the flood waters to pass

Kununurra Diversion Dam	
Height of roadway	20.1 metres
Length of spillway	335 metres
Length of dam including levees	5 kilometres
Length of storage	40 kilometres
Radial gates	20
Width of gates	15 metres
Height of gates	11 metres
Weight of gates	96.5 tonnes
Flood discharge	28,000 cubic metres/second

through, whilst limiting flooding of adjacent agricultural land. During the dry season the gates close to allow for water storage and diversion to the irrigation channel, ensuring a year-round supply of water.

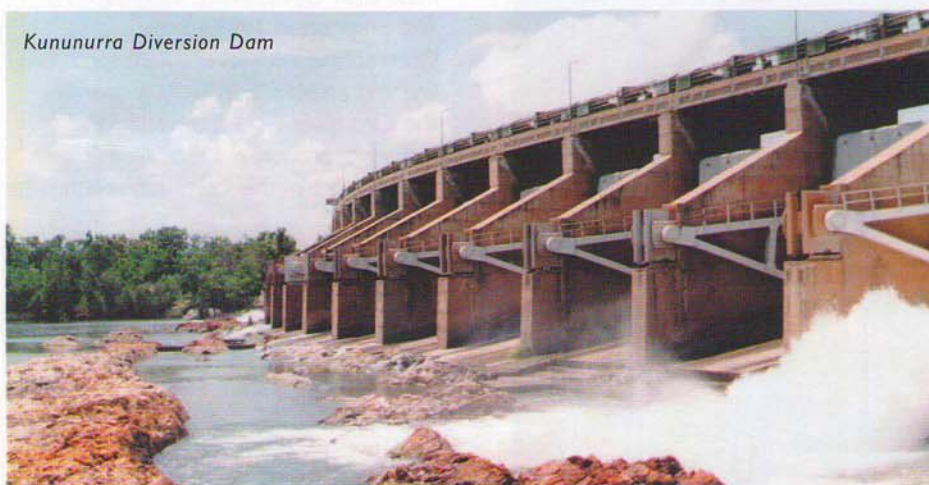
The flow down the lower Ord River was regulated by the opening and closing of these gates year round.

From 1960-1963, during the construction of the Diversion Dam,

many other projects were undertaken. Excavation equipment was busy developing the main irrigation channel (M1 Channel) extending approximately 25 kilometres north of the dam. Over 55 kilometres of mains and subsidiary channels were constructed as well as main roads such as the Darwin to Wyndham road, now known as the Victoria Highway, across the Kununurra Diversion Dam. Land also had to be cleared, ploughed and carefully graded before the irrigation activities could begin.

A pumping station at the beginning of the M1 Channel was also constructed to pump water into the irrigation channel when dam levels were low.

The Kununurra Diversion Dam was completed following the 1962/63 wet season when the Ord River roared with angry life. Until the initial fury of the flood passed, the gates were left open, and were then lowered when debris and mud was cleared. In March 1963, the Queen and Prince Phillip visited the project to see the waters of the Ord harnessed for the first time.



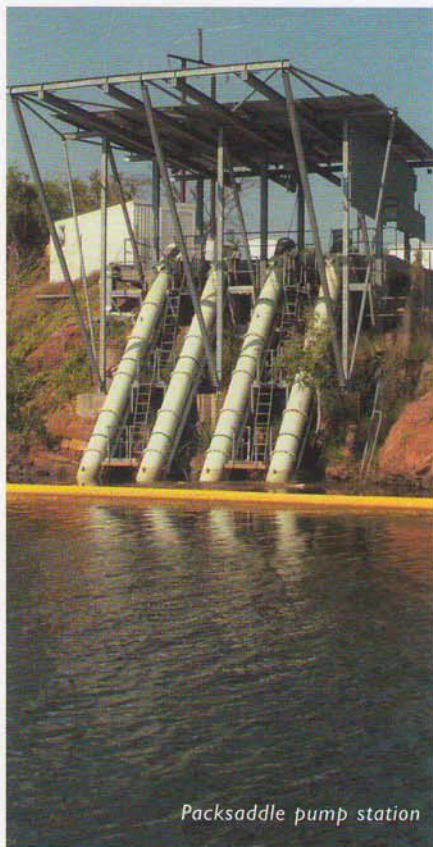
Kununurra Diversion Dam

Ord River Dam

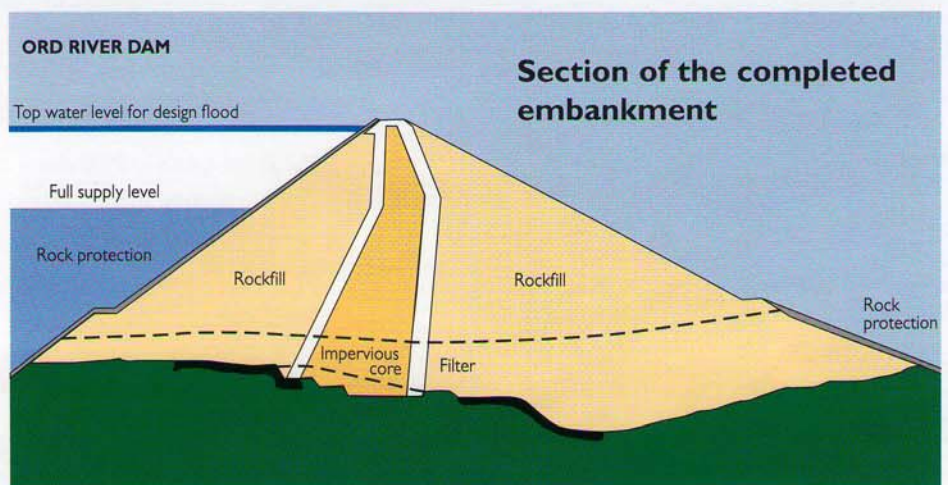
	Dam full supply level (AHD)	Surface area in millions of square metres	Volume in millions of cubic metres	Number of Sydney Harbours
Ord River Dam as commissioned in 1972	86.00 metres	669	5,641	11.2
New full supply level after weir was constructed across spillway in 1996	92.23 metres	980	10,763	21.4
Top of Ord River Dam <i>The dam is designed to impound water to the 'top of the dam wall' under extreme flood</i>	111.53 metres	2,100	40,500	80.15

In 1967, the Commonwealth provided a grant for the construction of the Ord River Dam to provide a major storage reservoir, called Lake Argyle, at a cost of \$22 million (\$225 million in today's value). The reservoir became one of the world's largest man made water bodies and was formed by an earth and rock filled dam in the Carr Boyd Ranges.

The Ord River Dam was completed in 1972 with the work carried out over three dry seasons. The dam was designed to never overflow at the main embankment with a 2.2 kilometres overflow cut made through solid rock between two hills, 8 kilometres from the dam wall.



Packsaddle pump station



When the Ord River Dam was completed, it became the largest capacity dam in Australia with a volume of 5641 gegalitres (equivalent to 11.2 Sydney Harbours). The flow from both dams was regulated to maintain a stable level in Lake Kununurra, which enabled the water to be diverted by gravity to the Ivanhoe Plain. The permanent water supply to Lake Kununurra also enabled the development for irrigated land on the adjacent Packsaddle Plain.

A further five farms were released in 1974 on Packsaddle Plain. That same year, the Gordon Dam was constructed near the West Coast of Tasmania, becoming the largest dam in Australia.

In the early 1990s, there was an increase in interest and likely demand for water in the East Kimberley. In anticipation, engineers determined that



Construction of the Ord River Dam intake tower

by building a weir across the spillway cut at the Ord River Dam they could safely raise the full storage level by six metres. This almost doubled the volume to 10,763 gegalitres (increasing the capacity to 21 Sydney Harbours). Completed in 1995/96, the weir ensured the Ord River Dam was once again the largest in Australia. This also improved the reliable yield and increased the energy available from the lake.

The development of multiple industries

A sugar cane farm on Ivanhoe Plain



Agriculture

The Ord Irrigation Scheme has successfully turned the arid desert environment of the East Kimberley into a thriving centre for agriculture. Today, the irrigation channel supplies water for more than 80 Ord River farms, covering an area of more than 11,700 hectares. A large variety of produce has been trialled in the area.

Previously, cotton was the foundation of the area's commercial agriculture. However, in 1973 natural pests decimated the crops, despite extensive chemical spraying. Production ceased in 1974 and processing gins were removed.

During the 1970s and early 1980s low-priced field crops such as sorghum, sunflower, soybean, maize and rice, along with hybrid seed crops, peanuts and mung beans, sustained the industry. During the 1980s there was another industry change with low value field crops becoming less relevant as high valued horticultural and hybrid seed crops were introduced.

Today's produce from one of the most dynamic agricultural areas in Australia includes melons, pumpkins, bananas, mangoes, cotton, sugar cane and hybrid seeds. New crops are continually being assessed and old crops reviewed as new varieties become available and markets change. The overall value of agricultural production in the Ord in 2004 was \$46.6 million.

During the 1990s, as the nation strove for economic efficiencies, a national reform on the water industry saw the

development of commercialised water utilities across Australia. The Water Corporation, previously the Water Authority, was developed in 1996. As part of this reform agenda, the Water Corporation commenced negotiations with local farm owners to privatise the operation of the irrigation distribution and drainage system. As a result, the farmers developed the Ord Irrigation Cooperative to represent their interests.

The Ord Irrigation Cooperative has now taken over the irrigation assets, operations and maintenance of 360 kilometres of channels, drains, water control structures, bridges and manages the distribution of the water from Lake Kununurra to each farm supply point from the Water Corporation. This transfer was completed in 2005.

The Ord River Irrigation area is made up of the following:

	Approximate Value		
	Stage One	Stage Two	Other
Ivanhoe Valley	13,000 ha		
Packsaddle Plain	2,500 ha		
Carlton Hill Plain			9,000 ha
Mantineia Flat			3,700 ha
Weaber Plain		14,500 ha	
Keep River Plain		10,600 ha	
Knox Creek		7,700 ha	
West Ivanhoe Plain	1,000 ha		
Total	16,500 ha	32,800 ha	12,700 ha

At present, most of the Ivanhoe and Packsaddle areas have been developed.

A farm irrigation channel on the Ivanhoe Plain



Ord Hydro

As the region grew, so did the demand for electricity. In 1996, Ord Hydro Pty Ltd constructed a 30 megawatt hydro-power station providing a clean and renewable energy source.

The power station was designed to utilise four turbines and two 15 megawatt generators to produce more than 220 gigawatt hours of electricity per annum.

Ord Hydro now supplies electricity to Wyndham, Kununurra and to the Argyle Diamond Mine.

Mining industry

In 1985, the Argyle Diamond Mine was commissioned, significantly helping the further development of the East Kimberley through employment and associated infrastructure, particularly in Kununurra. The Argyle Diamond Mine pumps water from the southern end of Lake Argyle for use at its mine.

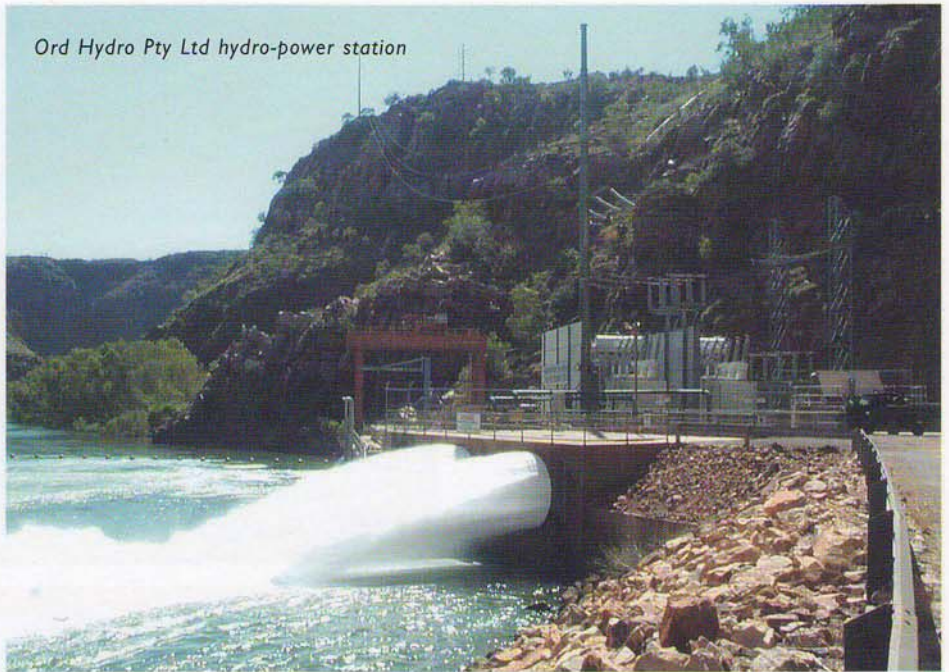
Fishing industry

Lake Argyle supports several licensed commercial fisherman who supply the Perth market with Lake Argyle silver cobbler.

Tourism

The Ord Irrigation Scheme has put the East Kimberley firmly on Australia's tourism map.

Ord Hydro Pty Ltd hydro-power station



The year-round waterways and agricultural industry has provided a variety of unique and varied ecosystems, boosting the development of the tourism industry.

Boating, fishing and water skiing are popular activities and the agricultural circuit is a feature of many tours.

Improved infrastructure and greater ability to access the area has created an ongoing tourism boom in the East Kimberley. Many small tourism businesses have been established, making the Ord and associated areas a major employer for Kununurra residents.

The future

In 2005, the signing of the Native Title Agreement resolved many native title and heritage issues affecting approximately 65,000 hectares around Kununurra and Lake Argyle.

The signing will facilitate the economic development of the East Kimberley, including Ord Stage 2. This stage aims to add a further 44,000 hectares of possible irrigated agricultural lands adding to the ongoing story of the development of one of Australia's most fertile agricultural areas.



Water Corporation
599 Bandicoot Drive
PO Box 21
Kununurra WA 6743

Telephone (08) 9168 0752
Facsimile (08) 9168 0700

www.watercorporation.com.au

