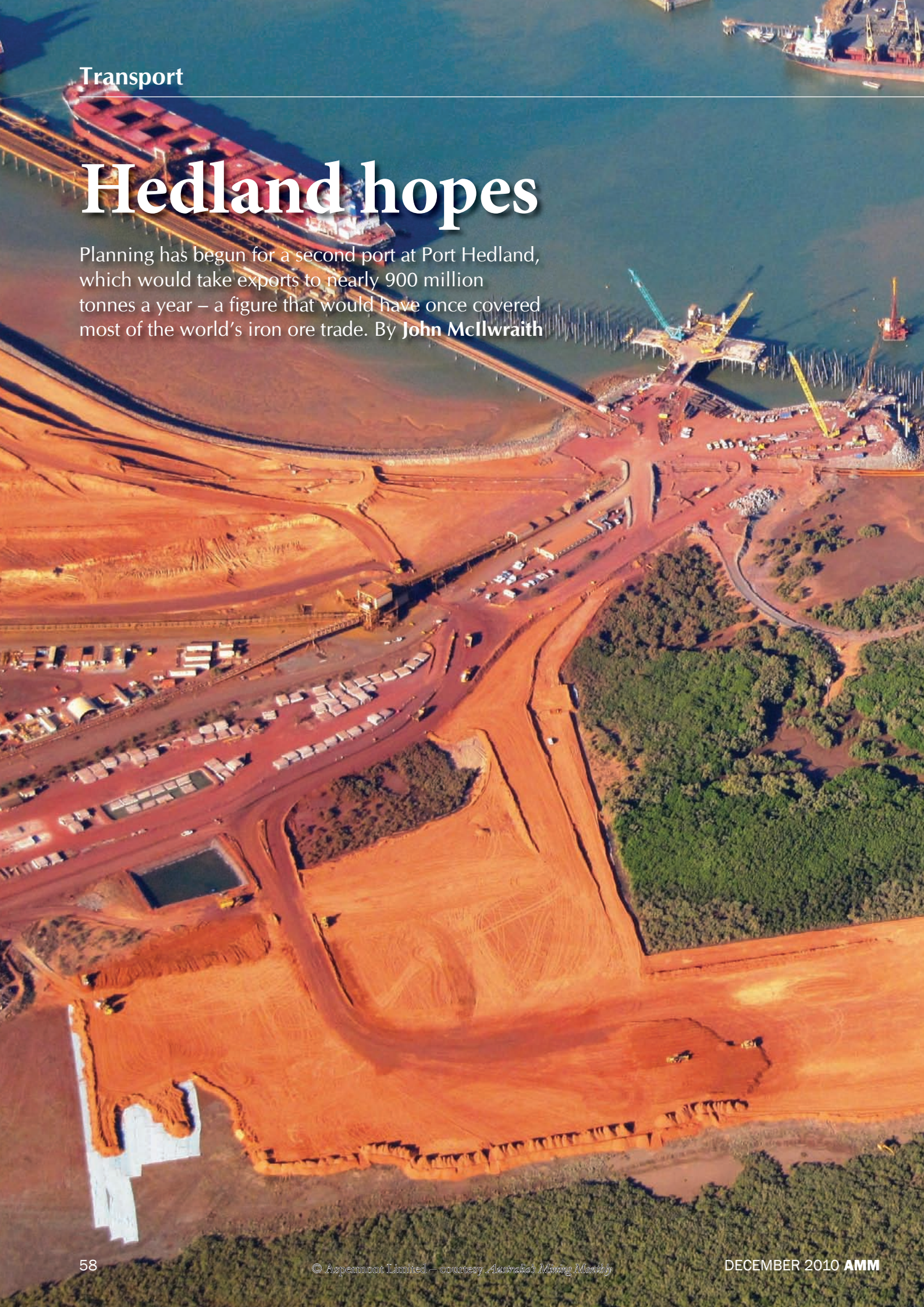
Hedland hopes

Planning has begun for a second port at Port Hedland, which would take exports to nearly 900 million tonnes a year – a figure that would have once covered most of the world's iron ore trade. By **John McIlwraith**



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Technology is helping Port Hedland boost its shipping tonnages.

The Port Hedland Port Authority is working towards expanding the existing port to nearly 500 million tonnes over the next five years. Meanwhile, a team of engineers and other specialists are working on plans for a new port, berths and a separate channel with a view to building these in the next five or six years.

Early planning calls for the building of 17 iron ore berths, each capable of loading 320,000 tonne carriers.

Even the expansion program at the existing port requires a major increase in resources. More tugs, pilots and supporting facilities, a dedicated dredge to intensify dredging in the harbour and the 37-metre channel are all needed.

The authority's planning for both expansion projects indicates its confidence that the Pilbara iron ore miners will win a breathtaking increase in iron ore exports, mainly to China.

BHP Billiton and Fortescue Metals Group, which are shipping out of Port Hedland, are expected to be joined by two other miners, adding to the need for a steady increase in port capacity. This is the factor regarded as one of the most serious challenges facing the industry, if the full potential for growth is to be realised.

Half a century ago Port Hedland was a sleepy northern outpost, and streets were closed to traffic, while sheep were herded onto tiny coastal vessels.

The port struggled to survive for most of the years after it was established at the end of the 19th century. It was the outlet for a small manganese mine but it took 23 days to manually load a cargo of a few thousand tonnes.

Today it is one of the world's biggest ports, a position that will be confirmed in the coming years.

Last financial year Port Hedland moved 170 million tonnes of iron ore, a record which will be eclipsed in the coming years. By 2011-12 the figure is expected to be 300 million tonnes.

One technology that has contributed to the greater movement of ore is the Dynamic Under Keel Clearance system – created 19 years ago by the Melbourne company OMC International.

Using sophisticated monitoring equipment and unique software, this system provides almost real-time data on tides, currents and other factors. It allows vessels to be loaded to a much greater depth than was safely possible in the past.

Thus a bulk carrier moving out of the port may have little more than a metre of water under its keel, in optimum conditions, enabling up to 8000 tones more ore to ▶

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The DUKC technology in action.

be loaded. In the years since the system has been in use it has added hundreds of millions of dollars to the revenue for Australian iron and coal companies, in ports in WA and Queensland.

DUKC is in use in 19 ports around the world but is particularly valuable in places such as Port Hedland where the aim is to safely move every possible tonne, if China's appetite is to be satisfied.

A major development will go some way to achieving this goal. Using OMC technology, the port authority can send up to five ships out of the port on a high tide, compared with three or so until now.

A record for the tonnage moved in a high tide was recently created when five carriers moved 870,000 tonnes of ore.

OMC is working on refinements that could increase this figure to six or seven, although not all of them will be the biggest bulk carriers.

The challenge is to make the most of the highest part of the tide to send out as many of the bigger carriers as possible.

The draft of these is equivalent to a six storey building and such depths have to be assured over the long channel to the open sea.

With a Canadian company, OMC also is developing better coordination with other segments of the shipping process, to further speed up loading and departures.

It has been estimated that DUKC adds 10% to the capacity of the port, 30% of which is achieved through additional drafts. The rest comes from increased sailing windows and the opportunities that flow from this.

The system has helped more than 50,000 vessels in depth restricted ports and waterways around the world and provided more than $10 billion in economic benefits to port users.

Earlier this year OMC introduced WaSP (wave spectrum predictor) to the port.

This enables ship loading to proceed with up to 36 hours notice of what conditions would be like in the port and channel.

Two years ago the port authority and OMC demonstrated how DUKC could help in a serious crisis.

Mindful of how disastrous it would be to have the entrance to the port blocked, the two worked to refloat a bulk carrier after it went aground as the result of a steering failure.

The DUKC Vessel Traffic Systems technology was employed to confirm an opportunity to have the vessel refloated into the main channel outside any usual sailing window. This was the first time the technique was employed anywhere.

The authority assembled eight tugs to help refloat the vessel on the next high tide. In Melbourne OMC, working with great urgency, confirmed there was only a short time in which the operation would work.

Dr Terry O'Brien, who founded OMC and developed the DUKC technology, said all parties had to work together quickly because of a rapidly closing tidal window.

"Our preliminary under keel clearance calculations indicated that the vessel needed to be refloated in a very short time frame," O'Brien said.

"The port authority acted quickly and was able to refloat and deballast the vessel and, using our latest technology, navigate it safely through to the end of the channel.

"This ensured the port was quickly unblocked and avoided massive costs to the shipping industry.

"Using the DUKC VTS technology, the marine pilots on the vessel had access to live up-to-the-minute under keel information and feedback throughout the three-hour transit to anchorage." AMM

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