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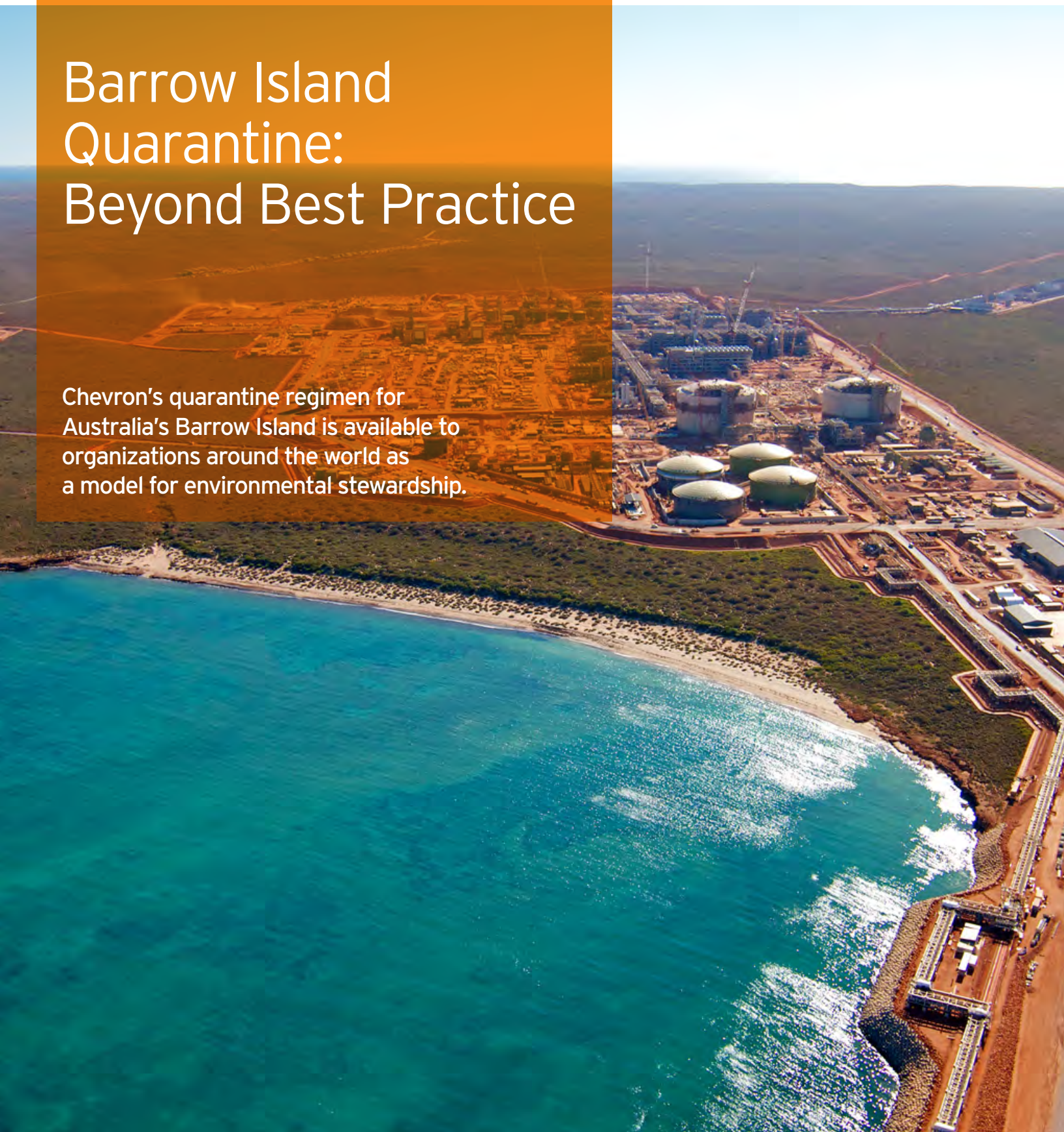
Barrow Island Quarantine: Beyond Best Practice

Chevron's quarantine regimen for Australia's Barrow Island is available to organizations around the world as a model for environmental stewardship.



"The QMS aims to facilitate the construction and operation of a gas processing facility on Barrow Island while protecting the conservation values of the island."

– Roy Krzywosinski, Chevron Australia Managing Director

Barrow Island is a sunbaked nature reserve painted with reddish soil, scrubby bushes and undulating limestone hills that is home to 24 species and subspecies found nowhere else on Earth. Located 37 miles (60 km) off the Western Australian coast, the island was last connected to the mainland more than 8,000 years ago. Giant perentie lizards as fast as an Olympic sprinter, golden bandicoots, burrowing bettongs and flatback turtles inhabit the island. In 1910, Barrow Island was designated a Class A Nature Reserve, the highest level of environmental protection offered by the Australian government.

To protect the unique ecosystems on and around the 91-square-mile (235-sq-km) island, a rigorous Quarantine Management System (QMS) was developed. The QMS pioneers a risk-based quarantine approach with more than 300 procedures, specifications, checklists and guidelines. One of the initiatives includes more than 70 acoustic sensors being placed on the island to detect the non-native Asian house gecko. The sensors are tuned to listen for the distinctive chirp of the gecko, which hitchhikes on vessels and cargo and could threaten native gecko species.

Fifty years have passed since the first well was spudded and oil began flowing on Barrow Island. It has become the largest onshore oil field in Australia and is also home to the Chevron-operated Gorgon Project. In 2009, Australian State and Commonwealth Governments approved the Gorgon Project, and today it is one of the world's largest natural gas projects and the largest single-resource development in the country's history. The Gorgon Project is operated by an Australian subsidiary of Chevron (47.3 percent interest), in joint venture with the Australian subsidiaries of ExxonMobil (25 percent), Shell (25 percent), Osaka Gas (1.25 percent), Tokyo Gas (1 percent) and Chubu Electric Power (0.417 percent). It includes the construction of a liquefied natural gas (LNG) plant and a domestic gas plant on Barrow Island, as well as offshore wells, a 1.3-mile (2.1-km) LNG loading jetty, and the world's largest commercial-scale CO_2 injection facility to reduce the project's greenhouse gas emissions. More than 6,000 people are living and working on and around the island, and hundreds of thousands of tons of cargo and equipment have been received, adding to the risk for the entry of nonindigenous species.

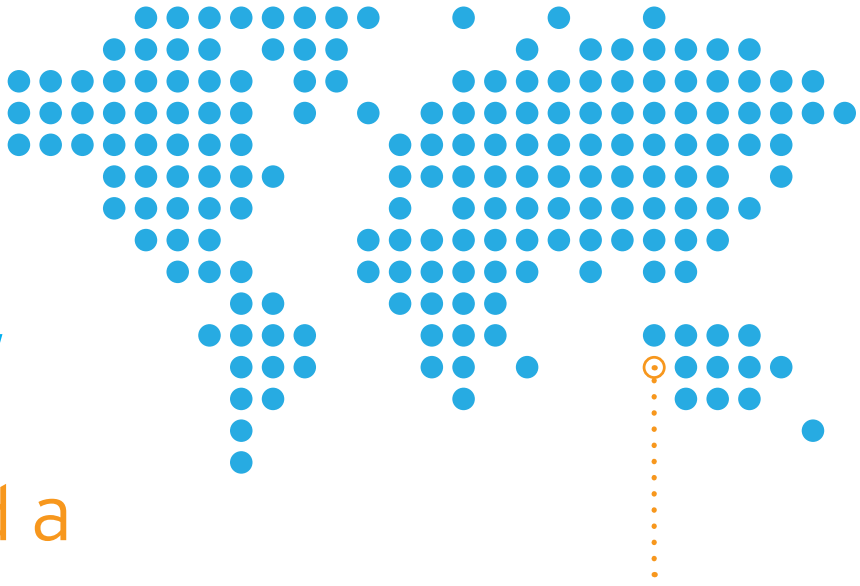
"It only takes one incident to destroy a species," said consultant and naturalist Dr. Harry Butler, who has worked in partnership with Chevron for 50 years. "Chevron has the highest-level government-approved program designed to continue to preserve the environmental values of Barrow Island. It is a globally recognized model for caring for the environment, a model copied around the world."

The QMS is the largest nongovernment quarantine initiative in the world. Since the Gorgon Project began, there have been zero introductions or proliferations of nonindigenous species on Barrow Island or in its surrounding waters.

"The QMS aims to facilitate the construction and operation of a gas processing facility on Barrow Island while protecting the conservation values of the island," said Roy Krzywosinski, Chevron Australia managing director. "Our team is setting new benchmarks in quarantine management involving surveillance and monitoring of non-native species and responding to any threats."

To see more about the Gorgon Project, watch the video at **https://www.youtube.com/watch?v=jtEqTKOjJAo&list=PLx5rSwZyx28j05A5rcsjxzPizf81SVp73&index=33**.

Similar to a small kangaroo, the Barrow Island euro is one of the 13 unique mammal species the QMS helps to protect. The euros graze on grasses, live close to water sources and are widespread across the island.



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Unique Barriers Protect Barrow Island

Since oil was discovered in 1964, Chevron has preserved the integrity of the island's environment by maintaining natural habitats and preventing the introduction of nonindigenous plants, animals and micro-organisms. More recently, these efforts have been supported and sustained by the development of the QMS.

Invasive species are one of the greatest threats to biodiversity and to the ecological and economic well-being of society and the planet, according to Australia's Commonwealth Scientific and Industrial Research Organization. This reinforces the importance of implementing effective quarantine measures to protect the environment.

"Quarantine management is about understanding the risk associated with our material pathways and putting effective barriers in place at key points during fabrication and in the supply chain to prevent quarantine risk material reaching Barrow Island," said Chevron Quarantine Manager Johann van der Merwe. The QMS applies to all Gorgon Project operations – whether in Australia, on Barrow Island or at any of our overseas construction facilities. Even vessels sailing to the island are subject to rigorous quarantine requirements.

Thirteen pathways have been identified by which nonindigenous species might enter the island, including food, luggage, marine vessels and helicopter transfers, to name a few. These pathways are part of the QMS protocol of interventions that span preborder (before goods and personnel reach the island), border (on arrival) and postborder (outside the development site).

Above: Up to 6.6 feet (2 m) long, the perentie is Australia's largest lizard. Unique spot patterns mean each animal can be recognized individually.

Preborder efforts focus on screening all passengers, cargo and equipment for quarantine compliance prior to arrival at Barrow Island. Anything noncompliant is remediated or refused transit to the island. Quarantine detector dogs screen passengers and their luggage for insects, fresh fruit, vegetables, seeds, soil and other items. Prior to transport, oversized machinery and equipment – including small buildings – are shrink-wrapped and pest control measures applied. Mail is screened using visual inspection techniques, detector dogs and X-ray before being sent to the island. All fresh food destined for Barrow Island undergoes intensive washing, preparation, packaging and inspection before it is shipped. This is a process that was originally developed for the Gorgon Project by a contractor, who now uses it as a model across its business.

Left, top: Shrink-wrapping, using recyclable plastic, helps ensure oversized machinery and equipment are kept free from quarantine risk material during transit to Barrow Island.

Bottom: Quarantine inspections of cargo and equipment prevent risk material such as soil, seeds and insects from reaching Barrow Island.

We have screened more than

10 million

employee meals,

55,000

shipping containers,

335,000

passengers to Barrow Island.

Upon arrival at Barrow Island, further inspections verify that no risk material was picked up during transit and nothing was overlooked during initial screening. If anything of concern is detected, the item is either remediated or immediately returned to the mainland.

"Today's technology gives us the ability to improve our detection of even the smallest risks, such as a single ant, millipede or spider, which has made a huge difference in our ability to protect the island," said Gorgon Project Quarantine Operations Manager Barbara Marks.

Postborder activities include ecological monitoring of species trends on the island, surveillance to determine the presence or absence of nonindigenous species, and eradication and control capabilities that provide an early chance of success without significant environmental harm.

"Our rapid response capability for quarantine issues and our preparedness plans are very specific," said Marks. "We have 47 response plans on how to address invasive species, so if a non-native ant species invades, we know exactly what to do to protect the island."

Detection capability has been enhanced by research. The most comprehensive baseline survey of insects on any island in Australia was conducted on Barrow Island prior to the start of the Gorgon Project. Almost 2,400 species were discovered, far more than the 1,500 originally predicted by scientists. All species have been digitized into high-resolution images in an online library available to the public, which facilitates rapid identification and response to prevent the establishment of a nonindigenous species.

Quarantine Culture Drives Success

The success of the QMS requires the active participation of all personnel – including contractors – and development of a culture of shared values and behaviors around quarantine.

"How do you convince someone in South Korea that quarantine is essential? For the QMS to be effective, we must also win the hearts and minds of those who will never see the island," said van der Merwe.

Quarantine training is mandatory and thorough, encompassing the island's unique environment, prevention strategies, response capabilities and individual responsibilities. A quarantine handbook for visitors to the island even

Left: More than 20,000 green turtles nest on Barrow Island, with females laying around five clutches of 100 eggs each season.

Chevron is sharing the QMS with organizations world-wide to help stem the global threat to biodiversity from invasive species.

addresses obscure questions about allowing guitars, protein powders and loose tea on the island (restrictions, inspections and declarations apply to each).

Quarantine has a top-of-mind presence for those working on Barrow Island, largely due to the comprehensive range of training and awareness activities that consistently reinforce quarantine requirements and build a supportive culture. "There is no hesitation by anyone to participate in the process and report something suspicious to Quarantine," said van der Merwe.

Detection successes have included a germinating grass seed discovered in an excavator radiator, a frog hidden in a tarpaulin, weed seeds embedded in a vehicle's rustproofing and a live gecko in a tennis racquet cover.

Sharing Best Practices

Chevron is sharing the QMS with organizations world-wide to help stem the global threat to biodiversity from invasive species.

"We're working with a number of institutions to combat what is becoming a global biosecurity issue," said van der Merwe. Chevron has advised the U.S. Department of Defense, as well as other entities, on effective quarantine measures.

In 2013, the Quarantine team collaborated with the Australian Antarctic Division to refine quarantine procedures for scientists and tourists visiting Antarctica, which has experienced an increase in the number of nonindigenous species.

Barrow Island's QMS has earned international recognition for its excellence in environmental management and stewardship, receiving the Australian Petroleum Production and Exploration Association's 2011 Environment Award, the 2011 Environment Award at the Western Australia Engineering Excellence Awards, and the 2012 United Nations award for Environmental Best Practice.

"Exploration increasingly takes us into remote and sensitive areas," said van der Merwe. "What we have achieved on Barrow Island helps support Chevron's endeavors to unlock future potential, particularly in locations with high conservation values."

To see more about Chevron's QMS, watch the video at **https://www.youtube.com/watch?v=rOpBFGOszQI&feature=player_embedded"**.

Read more about Chevron's QMS at **ChevronAustralia.com/our-businesses/gorgon/environmental-responsibility/quarantine**.

For more information on Chevron's commitment to biodiversity conservation, visit **Chevron.com/Biodiversity**.

Learn more about Chevron's commitment to environmental stewardship at **Chevron.com/Environment**.

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