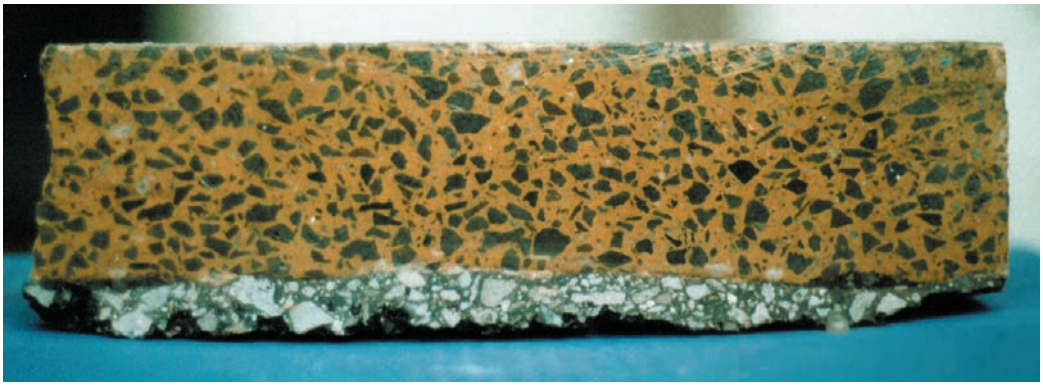

A cross-section through GE0320 asphalt laid on a road base, showing a lack of the 'voids' (air spaces) which normally weaken regular asphalt bitumen. EcoPave

Life could be cooler with sugar coated roads

Family-owned Australian company, EcoPave, has developed a commercially viable, non-petroleum-based asphalt substitute made from organic wastes, such as the sugar by-product molasses. Its GEO320 asphalt not only out-performs regular, 'old-fashioned' road asphalt bitumen, it is also less toxic and promises reduced environmental impacts. EcoPave say their product is internationally unique.

Under development and testing for 20 years, GEO320 has come of age – right on time it seems. About 2 billion tonnes of asphalt bitumen are used annually around the world and demand is growing dramatically – especially as Asia's development boom continues.

Bitumen, which is the main component of regular asphalt, is manufactured by an energy-intensive process from rare, heavy-grade crude oil. It is then developed into aggregated asphalt road surfacing using further petrochemical by-products and solvents. These emit lots of toxic fumes and residues at all stages of production.

GEO320, on the other hand, can be made from a range of organic waste products including those from sugar, palm oil and coconut processing, and potentially sewage effluent. EcoPave say they can also develop it from recycled motor oil.

At present molasses is primarily being used to produce GEO320. The result is an asphalt that is non-toxic, comes in a dry granulated form, requires no hot storage, has 50% higher durability, greater resistance to fatigue, wear, cracking, fading and solvents, low volatile emissions, and unlike current bitumen road surfaces, a safer non-slip surface.

In addition, its higher light reflection in coloured form means it absorbs 50% less heat, thereby helping to reduce the 'heat island' effect of higher temperatures in built up areas, contributed to by today's dark roads. Recycled plastics can be incorporated into the aggregate stage, and the EcoPave asphalt is fully recyclable.

'Road safety and the environment were the main reasons when designing GEO320,' said Mr Eerik Owerhall, owner-partner of Ecopave Australia. 'To date there has been no alternative to bitumen which is probably one of the last remaining products that has not seen major progress in terms of its source and characteristics.'

After benchmark testing by research and transport organisations since 1987, EcoPave has just won its first tender to provide to GEO320 for the EcoVillage development at Currumbin, Queensland.

'We're suddenly getting many international enquires, but can't service them all at present. We're seeking venture capital assistance,' Mr Owerhall said. 'India, for example, has requested a licence to produce GEO320, but we want to service the Australian market first.'

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Marine DNA work eases drug search pressure on wild stocks

A new methodology, developed by an international team of scientists from the Australian Institute of Marine Science (AIMS), the University of Aberdeen, and The London School of Pharmacy, has removed a huge hurdle to the development of new drugs from the sea. By cloning marine DNA into the common bacterium *E. coli*, the researchers hope to obtain a sustainable supply of exciting new drug leads from the sea, without compromising wild stocks of the marine species currently collected for new drug research.

The work is a world-first achievement designed to eliminate the supply obstacle that has stalled the development of many promising marine-derived pharmaceuticals.

To produce a cancer-fighting drug from a marine-source, for example, we might need to harvest 20 000 tonnes of a particular sponge per year…

Dr Walt Dunlap, a leading biochemist from the Australian Institute of Marine Science (AIMS), said compounds from marine organisms, like seasquirts and sponges, show exceptional promise for the treatment of cancer, inflammation and viral diseases.

The main problem has been obtaining a large-scale supply of these complex chemicals for worldwide use in an ecologically sustainable and economically viable way.

AIMS Marine Biotechnology Group Leader Dr Chris Battershill said it is one of the most important breakthroughs in marine biotechnology in recent times and heralds a new future for drugs from the sea.

'Without an assured source pharmaceutical companies are unwilling to invest the estimated $800 million it takes to get a drug from the sea to the shelves. To produce a cancer-fighting drug from a