



resources
for the future



ARAFURA
RESOURCES LIMITED

Rare Earths and phosphates are used extensively in the manufacture of many household products.

LCD/Plasma Televisions

Fertiliser

Electronic Equipment

Dentistry

Optics



Rare Earths and Phosphates in everyday life

Summary

Rare earths are essential components of products with significant growth potential in the markets associated with the electronics and high technology industries, energy efficiency and greenhouse gas reduction.

Coupled with phosphates as a key input to fertilisers, detergents and foodstuffs, and calcium chloride that is used as a de-icing and a road binding agent, the Nolans project delivers Arafura a multiple commodity revenue stream across a range of products in existing and emerging markets.

The Nolans rare earths specialty metals project is Arafura Resources' flagship asset. The project has the potential to be a large, low cost producer of rare earths with significant co-products of phosphate and calcium chloride.

Today's world demands smaller, faster and cleaner forms of technology.

We are focused on economic, environmental and social returns in everything we do, and the products which deliver these outcomes are rapidly growing in demand.

Arafura's Nolans project is well placed to meet this demand, delivering a new source of rare earths into a burgeoning market.

What do rare earths bring?

Rare earths are essential for the electronics industry. They are key components in energy efficient products and directly contribute to reducing greenhouse gas emissions.

Laptop computers, recreational audio visual equipment, mobile telephones and plasma screens all contain rare earths and are now used everyday throughout the world. Rare earths are fundamental to and irreplaceable in our modern lifestyle.

The global pursuit of reducing greenhouse gas emissions has resulted in the growth of the fuel efficient hybrid car market.

Rare earths are delivering the 'style' in lifestyle, and Nolans will play a major role in this growth industry.

Did you know?

A growing awareness of the need for and commitment to minimising greenhouse gas emissions is driving the growth in demand for neodymium, which is used in energy efficient compact electric motors. Lanthanum is a major component in re-chargeable batteries used in hybrid vehicles and portable power tools.

Phosphoric acid and calcium chloride have many commercial, industrial and domestic uses.

Phosphates and Calcium Chloride

The Nolans project is delivering products for the future as well as materials for well established, active and transparent markets.

With the capability to produce phosphoric acid and calcium chloride Nolans provides multiple market opportunities.

Phosphoric acid is a fundamental building block in the production of phosphate fertilisers, detergents, food stuffs and several other chemicals that contribute to today's improving standard of living particularly in emerging economies like Brazil, Russia, India and China.

With the potential high growth of ethanol as an alternative fuel, much of which is extracted from corn, phosphate fertilisers will be essential to this industry.

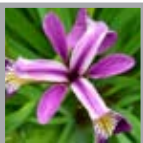
Calcium chloride is used as an anti-freeze agent, as a binding agent for road construction, as a sealant/dust suppressant agent for unsealed roads and as an additive to drilling fluids.

With the current drive by Australia's booming mining industry to cut water consumption, the major portion of which is for dust suppression on mine haul roads, there is a unique opportunity to pioneer the use of calcium chloride to reduce water use.

The many uses of phosphoric acid and calcium chloride

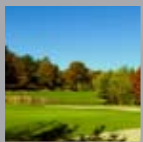
Phosphoric Acid

Fertiliser Uses



Botanical (Horticulture)

Provides an essential nutrient for promoting plant growth, particularly in establishing hardy root systems.



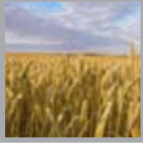
Botanical (Maintenance/Seasonal)

When applied to mature tree crops and pastures it promotes regrowth.



Fruit

Tomatoes and berries maintain their firmness when processed with phosphoric acid.



Crops

Crop yields are enhanced when phosphate is applied.

Chemical Uses



Detergents

Softens water, removes soils, dissolves fats and serves as an anti-spotter in dishwashing.



Fire suppressants

In fire extinguishers.



Pesticides

Organophosphates are an invaluable pesticide against crop damaging insects.



Grain

It is used as an effective herbicide which is absorbed through the leaves of weeds.

Calcium Chloride



Ice Removal

Is resistant to temperature extremes and acts as a buffer to maintain alkaline pH.



Dust Suppressants

Is a very effective dust suppressant and stabiliser, particularly on dirt roads and in mining environments.



Road Binding

Modifies asphalt to meet performance requirements.



Concrete Structures

Accelerates curing in low temperature applications.



Oil Drilling Fluids

Modifies drilling fluids during difficult or deeper drilling campaigns.



Chemical heating

Delivers heat resistance for processing in the steel industry through refractory qualities.



Dehumidification of air

Removes moisture from the air in critical environments.



Water Purification

Acts as a purifier in a range of products, softening water and preventing scale build up in manufacturing processes.

Rare Earths

Meeting Future Needs Now

Environmental Leadership



Reducing fuel consumption

Neodymium is used in the electric motors in hybrid cars.



Reducing greenhouse gas emissions

Rare earth compounds play a fundamental role in fuel efficient hybrid vehicles, helping to reduce greenhouse gas emissions.



Autocatalysts

Mixed rare earth oxides are used in environmental catalysts including exhaust converters, chemical scrubbers and other gaseous products and waste streams.

Energy



Petroleum refining

Lanthanum oxide is used in petroleum cracking catalysts in the oil refining industry.



Rechargeable batteries

Lanthanum is a key component in rechargeable NiMH batteries.

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Electronics



Colour screen LCDs/PDPs

Europium, terbium and yttrium are used as phosphors in electronic screens.



Components to hardware

Neodymium permanent magnets and other rare earths are used in computer hard disk drives.



Medical services

Rare earths are essential components in MRIs. Samarium is used in treating severe pain associated with bone cancer patients.

Technology



High-powered electric motors

Neodymium and samarium are used in the strongest permanent magnets known. Electric motors in hybrid cars use these magnets to achieve superior output and torque.



New generation vehicles

Lanthanum is a key component in the rechargeable NiMH batteries used in hybrid cars. Lanthanum is also used as a catalyst in hydrogen fuel cell technology.



Level 4, 16 St Georges Terrace
Perth WA 6000
PO Box 3047, Adelaide Terrace
Perth WA 6832

Telephone : (618) 9221 7666
Facsimile : (618) 9221 7966
Web : www.arafuraresources.com.au
ACN : 080 933 455