Our History

1940 to 2020

CELEBRATING 80 YEARS

Mineral Technologies
A Downer Company

Downer
Relationships creating success

Celebrating 80 years in 2020, Mineral Technologies has been built on the passion and vision of our people striving to bring innovation and unparalleled quality solutions to the mineral processing sector worldwide.

Beginning with Bert Watson walking door to door in Southport selling shares to establish the Mineral Deposits Syndicate, to Ernst Reichert developing the first Cone Concentrators to separate heavy minerals, mainly Rutile and Zircon, from sand at local Gold Coast beaches, to today's position as a world leader in mineral separation solutions.

We are delighted to present this book to commemorate our first 80 years, and we look forward to continuing to bring technology and innovation to improve mineral processing operations for the next 80 years.

Our History

1940s

1950s

1960s

1970s

1980s

1990s

2000s

2010s

2020s

Treatment Works, Southport, 1949

1940s

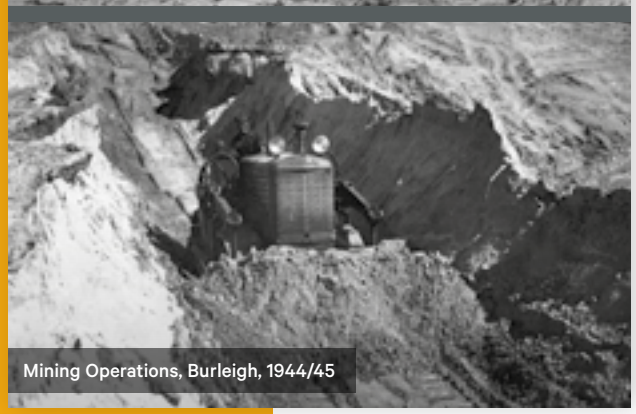
In the 1940s Bert Watson and a handful of other investors established Mineral Deposits Syndicate (MDS).

With operations based on the Gold Coast, mineral was shovelled off the beach into trucks before being dried and exported. Lower grade material was processed over crude spirals made from tyres and concrete on the banks of the Nerang River at Brighton Parade, Southport to extract the valuable heavy minerals. Joining MDS in 1946, Ernst Reichert developed electrostatic plate separators for use in the Southport plant.

Delivery of raw material for processing showing monitor in operation, Southport, 1949

Spiral Plant, Burleigh Heads, 1944

Dewatering heavy mineral concentrates after tabling, Southport, 1949



Mining Operations, Burleigh, 1944/45

1940s

Ernst Reichert, Developer of the Reichert Cone Concentrator

Early mining activities, 1940s

General view of mining operations at Burleigh, showing pit above, with rehabilitation progress by bulldozer, 1944/45

Spiral Production, Southport, 1950s

1950S

The National Lead Company acquired a controlling interest in forming Mineral Deposits Pty Ltd (MDL) in 1955.

Six dredging and mobile spiral separation plants were established on Gold Coast beaches from the Spit to Coolangatta. During this decade Ernst Reichert developed the first Cone Concentrators to provide improved separation performance over the rudimentary spiral technology of the time. In 1957 MDL developed its Crescent Head operation in NSW utilising newly developed MDL equipment.

MINERAL DEPOSITS SYNDICATE

Letter regarding the Agreement for the purchase of the Syndicate by Mineral Deposits Pty Ltd, 1955

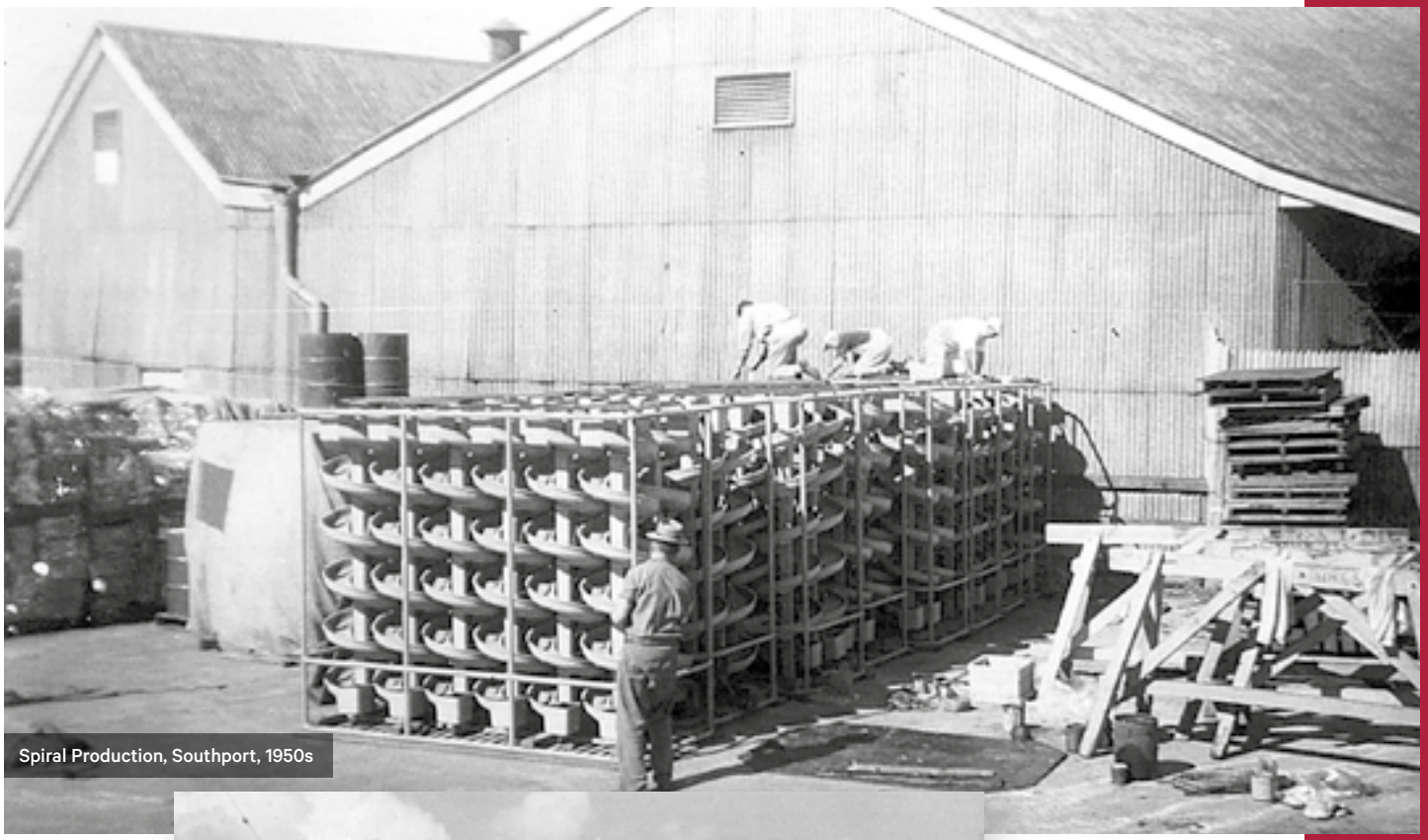
Mineral Deposits Pty Ltd, Southport, 1952

MDL Employees, Southport, 1955

Mining Operations, Crescent Head, 1958

Mineral Deposits Pty Ltd, Southport, 1952

1950s



Spiral Production, Southport, 1950s

Spirals loaded ready for shipment, 1950s

Spiral Production, Southport, 1950s

Spirals being loaded, Southport, 1960s

1960s

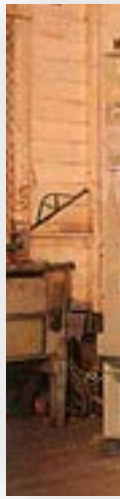
MDL developed and manufactured the first fibreglass spirals for its own use and started to manufacture for export.

Listed as a public company in 1967, MDL ceased mining on the Gold Coast in that same year and in 1968 commissioned a new mining operation in Hawks Nest, NSW. The Reichert Mining Equipment Division was established to manage MDL's equipment manufacturing and plant design activities. Technical marketing and sales of MDL equipment and services started in the late 1960s.

Installing Reichert Cone Concentrators in MDL's 900 tph Booti Booti Plant, near Forster, NSW, 1969

Spiral inspection, 1960s

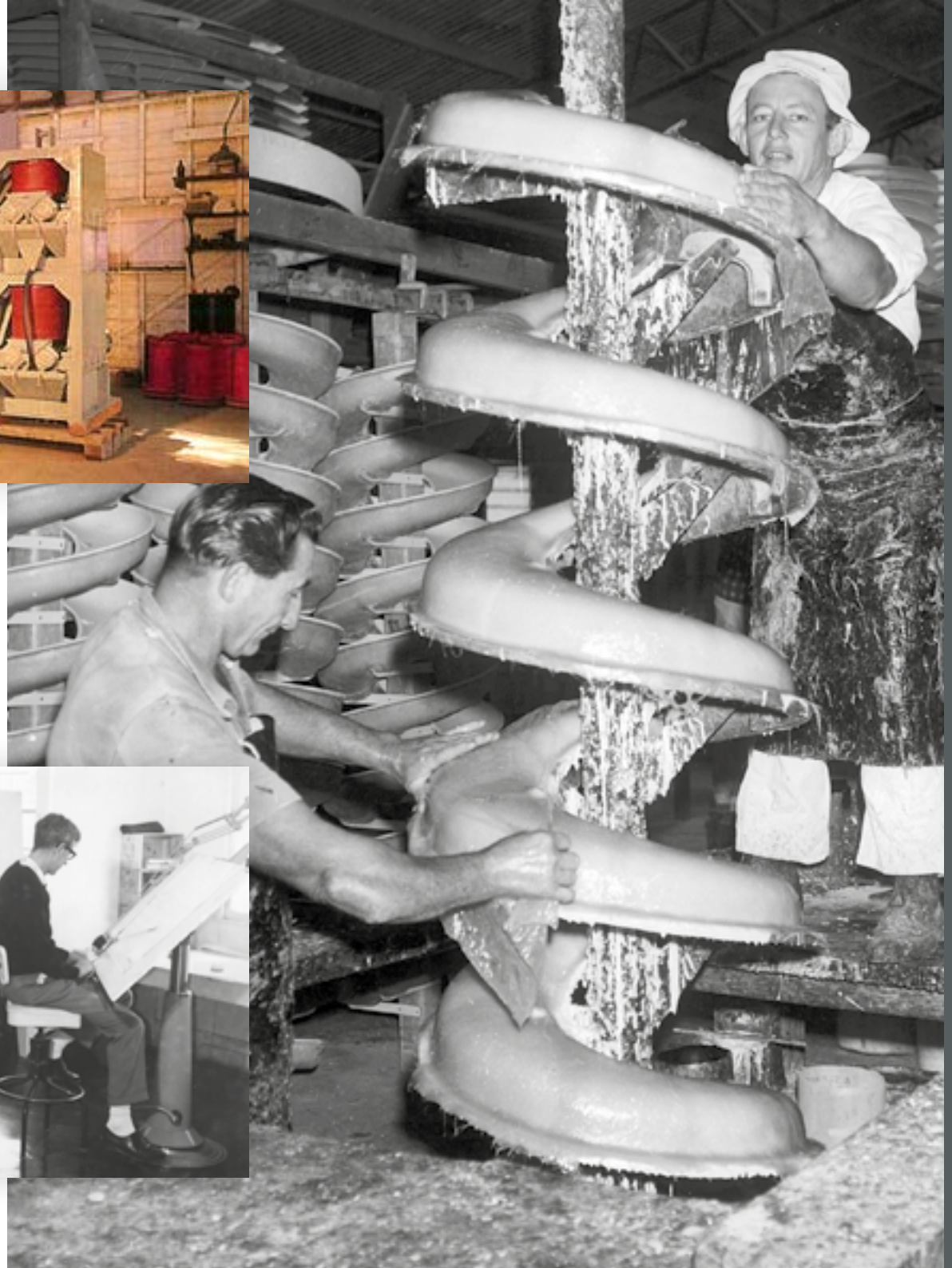
Booti Booti, 900 tph plant near Forster, NSW, 1969



Reichert Cone Concentrators in 900 tph mineral sands plant, 1960s

MDL employee Ivan Latimer adjusts
MkI High Tension Separator, 1963

Drawing Office, Southport, 1968



Equipment
manufactured
at Southport
workshops, 1960s

1960s

MDL Team, Bundall, 1969-70

1970S

MDL had 10 wet separation plants and 3 mineral separation plants in operation, and for a time was the second largest producer of rutile and zircon in the world.

MDL prepared the first ever environmental impact statement in Australia for a mining operation which included the ultimate rehabilitation of its proposed Bridge Hill Ridge operation in New South Wales.

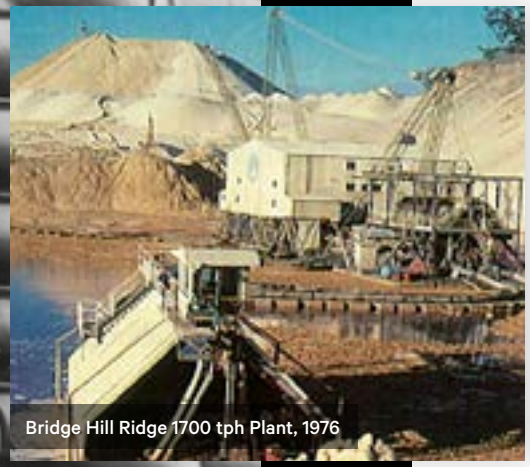
In 1970 MDL's office, factory and metallurgical testing laboratory was relocated to Bundall and in 1971 its first overseas office was established in Denver, USA. This was followed by the establishment of an office in South Africa in 1973.

In 1979 MDL was purchased by United Mining Australia Limited (UMAL).

HRH Prince Philip, the Duke of Edinburgh, being briefed by Mr Charles Newey, MDL's Manager, Planning and Development on mine proposals in the NSW Myall Lakes District, 1972

New Bundall Head Office, 1970s

Aerial View, New Bundall Head Office, 1970's



Bridge Hill Ridge 1700 tph Plant, 1976

Final Assembly of Electrostatic Screen Plate Separators for Richards Bay Mineral Sands Project, 1976

Mark II Spirals, 1971

1970s

THE AUSTRALIAN

What's this paper all about?

High level of exploration sought

INVEST IN OUR MINES, SAYS PM

State's big asset is coal – Wran

Basis should be on a 'fair sharing'

Australia markets mining know-how

Special edition of The Australian newspaper, 1978

New Drafting Office, Bundall, 1970

Equipment Manufacturing, Bundall, 1970

Environmentalist and TV presenter, Harry Butler (wearing hat), visited the Bridge Hill Ridge operation and praised the rehabilitation work being done post-mining

State Government officials at Bridge Hill Ridge Plant led by NSW Minister for Mineral Resources and Development, Mr Ron Mulock with MDL's Ecologist Dr John Lewis and Supervisor Mr Graeme Wells, 1979

Booti Booti, 900 tph plant relocated from Forster, NSW to Viney Creek, NSW in 1987 and upgraded to 1700 tph plant

1980S

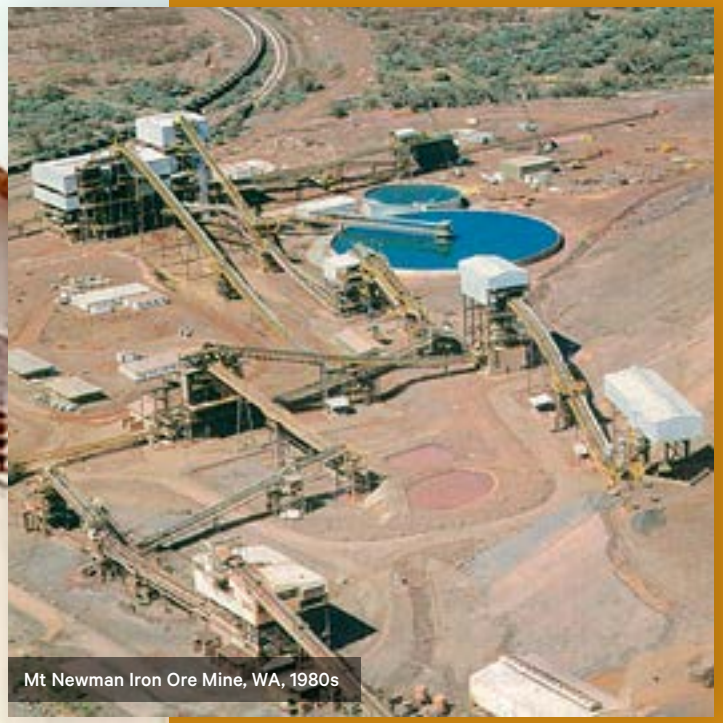
MDL expanded by relocating an existing plant to Bridge Hill Ridge in 1974 which operated successfully until 1983, having mined and processed over 130 million tonnes of mineral-bearing sands.

Purchased by BHP in 1984, MDL acquired new technologies and expertise including Doug Wright's wash water-less spiral technology in 1985 and Vickers Fine Minerals Engineering Division in 1986.

New methods of spiral manufacture were developed incorporating reverse casting and solvent-less polyurethane spraying techniques.

Trade show promotion, Las Vegas, USA, 1982

Wet Gravity and Magnetic Separation Plant, Ceylon Mineral Sands, Sri Lanka, 1984

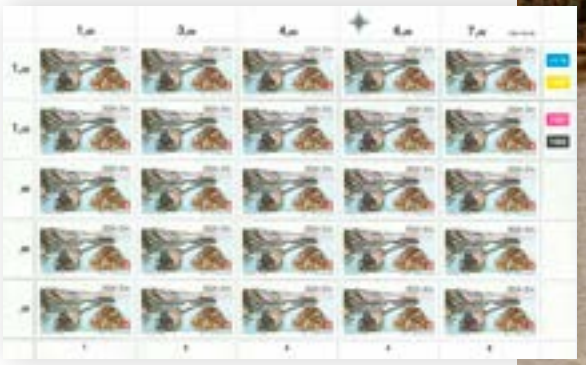


Mt Newman Iron Ore Mine, WA, 1980s

Mineral Technologies employee Peter Haber commissioning work at Sierra Rutile, Sierra Leone, 1985

Wet Concentration Plant, Indian Rare Earths, Manavalakurichi, India, 1985

Dredge and Wet Concentrator Plant, Romania, 1983



Stamps printed to commemorate Richards Bay Minerals Titanium Operations, South Africa, 1984

1980s

Sierra Rutile, Sierra Leone, 1980s

Team outside new head office, Carrara, 1990s

1990s

A significant slump in the mineral sands industry in the early 1990s had a major impact on MDL's equipment business with staff numbers reducing from 350 to just 75.

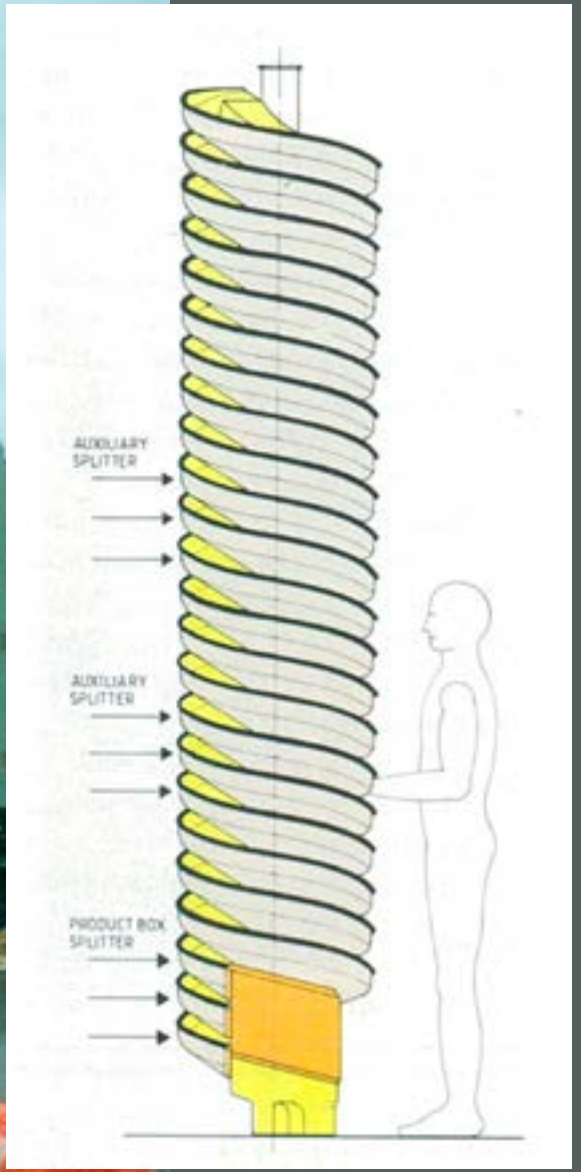
The Technology and Equipment division was subsequently purchased by Clyde Industries Limited in 1994 which was subsequently taken over by EDI in 1996 with the company renamed MD Mineral Technologies.

MDL's Mining Division was retained by BHP as BHP Titanium Minerals. MD Mineral Technologies was subsequently engaged to design BHP Titanium Minerals' Beenup operation and supply the bulk of the separation equipment.

MD Mineral Technologies office was relocated to Carrara, Queensland in 1996.

Kenmare Resources, Mozambique, 1990s
(Previously Beenup plant relocated from Australia)

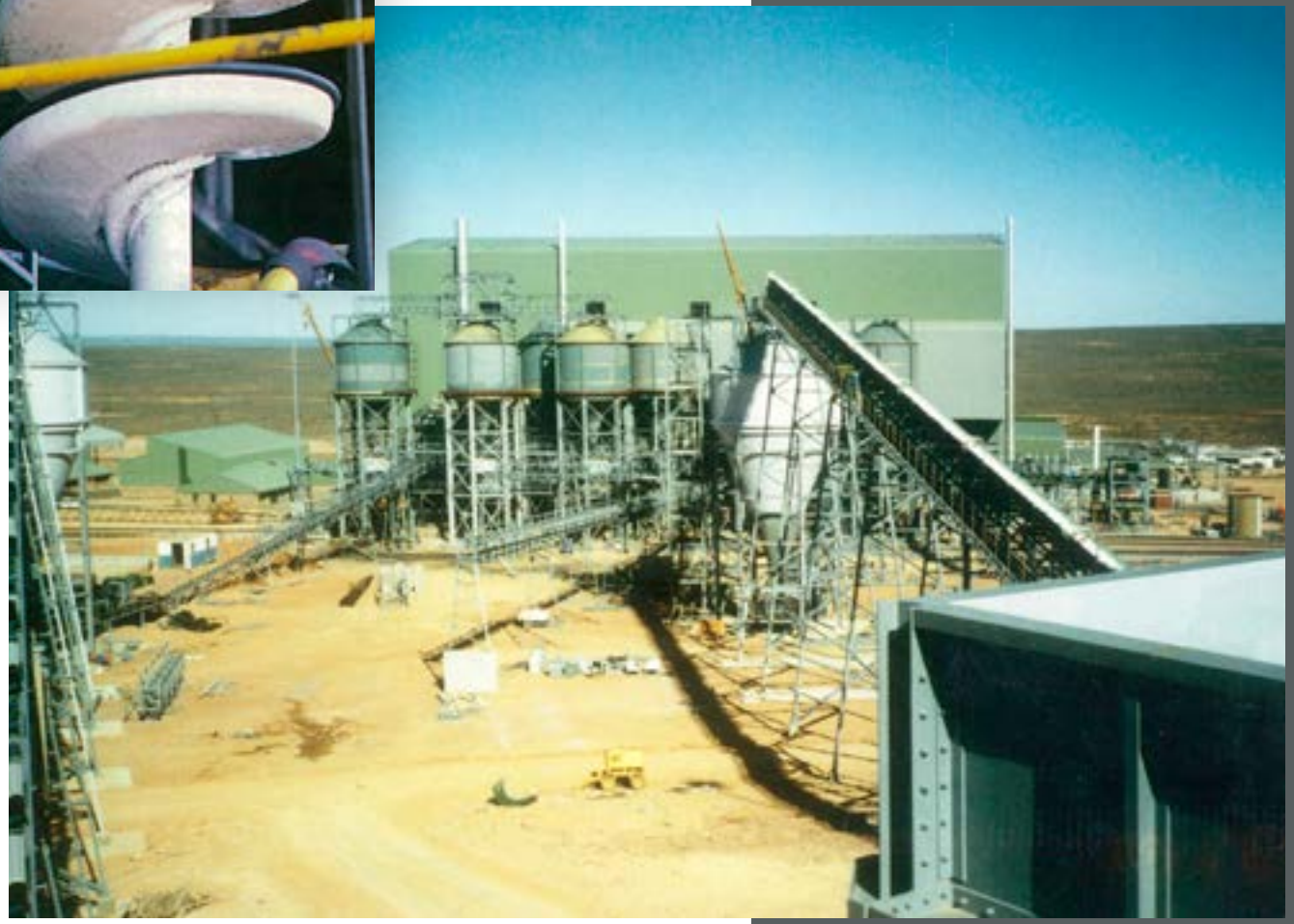
BHP Titanium Minerals 3,000 tph Plant, Beenup, Western Australia, 1997



HG7 Spiral Drawing, 1990s

1990s

Coal Spiral Operation, 1990s



Gravity Separator and
Dry Mill, Namakwa Sands,
South Africa, 1994

Ginkgo Plant, Australia, 2005

2000s

In 2001, Downer merged with Mineral Technologies' parent company, Evans Deakin Industries, to form Downer EDI.

Mineral Technologies acquired the Readings Magnetic Separator and Kelsey Jig technology and designed the new Carrara Insulated Plate High Tension Roll (HTR) separator providing a step change in performance, transforming the design of Mineral Separation plants worldwide. Continuing research into spiral design led to the development of new high capacity mineral spirals and 2 stage spirals for coal treatment.

One of the busiest times in Mineral Technologies' history, the team commenced design of the world's largest spiral plant for Grande Côte Operations in Senegal, Africa. During this period spiral production capacity reached 20,000 starts annually which was a new world record.

Millennium Plant, Brazil, 2000s

Ginkgo Plant, Australia, 2005

Jacinth-Ambrosia, Australia, 2006

Kenmare, Mozambique, 2008

2000s

Test Rig, Mikhailovsky, Russia, 2006

Namakwa Sands, South Africa, 2010

Grande Côte, Senegal, 2014

2010s

Mineral Technologies' flagship MG12, 2-stage rougher/scavenger spiral was developed along with smaller, lower cost units for chrome and iron ore treatment.

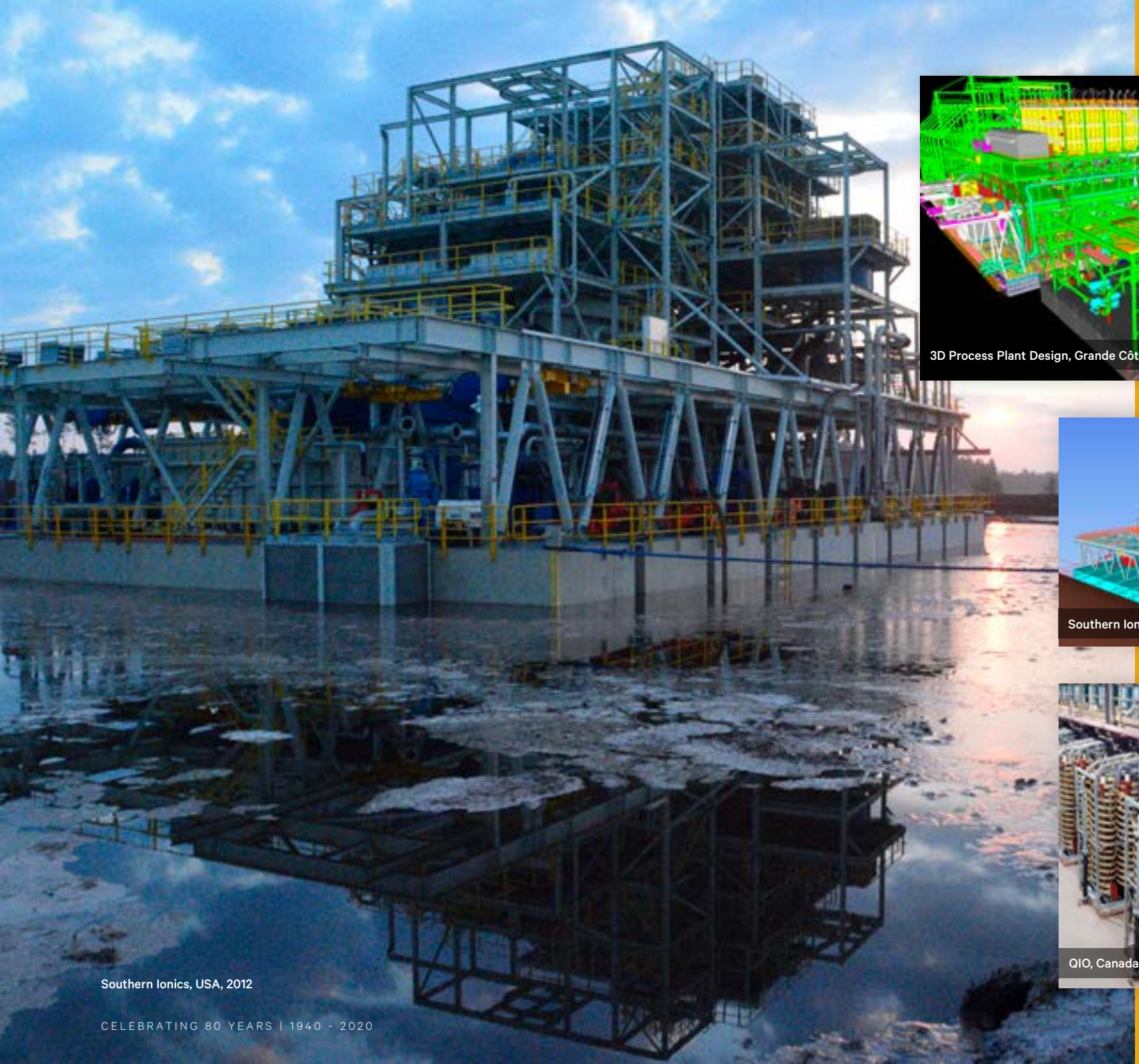
Manufacturing was rapidly expanded to deliver over 8,400 spiral starts to ArcelorMittal's Mont Wright mine in Canada from 2010 to 2012. A key engineering innovation was the development of rubber alternatives to standard polyurethane parts to meet ArcelorMittal's objectives of extended spiral longevity and durability.

Process plants were designed for tailings retreatment projects and modular designs were introduced providing customers with mobile plants that could be easily moved from site to site.

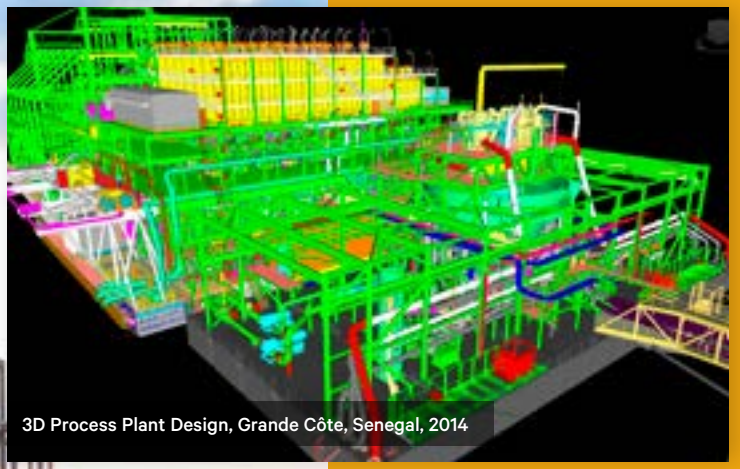
New technologies were explored resulting in smaller compact spirals and new additive manufacturing techniques.

Iron Baron, OneSteel, Australia, 2012

Mineral Technologies' manufacturing process underwent a step change by implementing LEAN Manufacturing principles and training all employees on continuous improvement techniques. Whilst the Australian manufacturing competitive index was falling and key production facilities closing down, Mineral Technologies continued to innovate and remove waste from workflows which allowed the niche intellectual property to be protected by remaining proudly Australian made.



Southern Ionics, USA, 2012



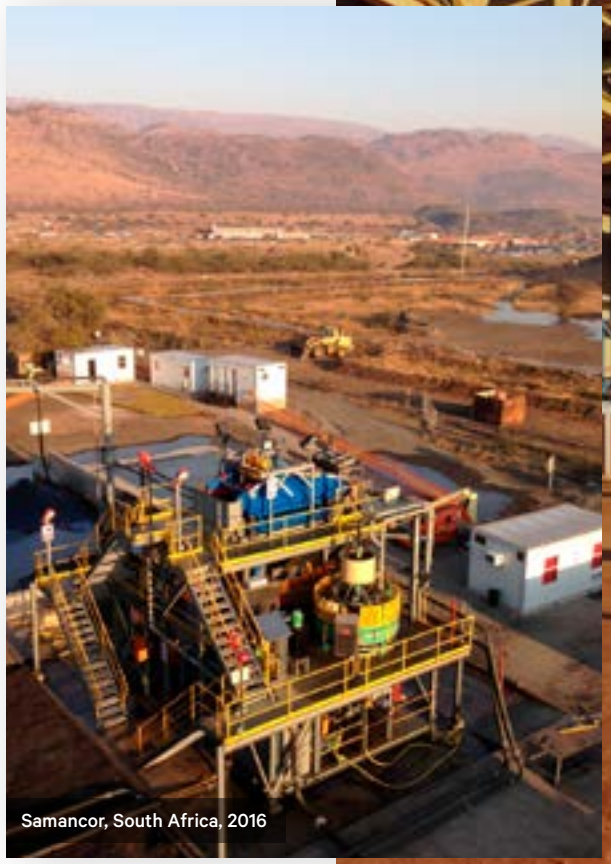
3D Process Plant Design, Grande Côte, Senegal, 2014

Southern Ionics Plant Design, USA, 2010

QIO, Canada, 2018

2010S

Iron Ore Spirals, Canada, 2019



Samancor, South Africa, 2016

Base Resources, Kenya, 2018

Modular Plant Construction, 2020

2020s

Today Mineral Technologies is living its vision to be the leading global provider of quality physical mineral separation solutions that maximise the value of customer mineral assets through highly skilled people and innovative process technologies.

As we move into the 2020s we are bringing new, innovative process solutions to customers. These include new surge bin technology with our Lyons Feed Control Units, truckless mining solutions with our Mobile Mining Units and a new range of Modular Plants which are enabling customers to easily relocate processing operations across mine sites and across different projects, maximising capital expenditure and operational efficiencies.

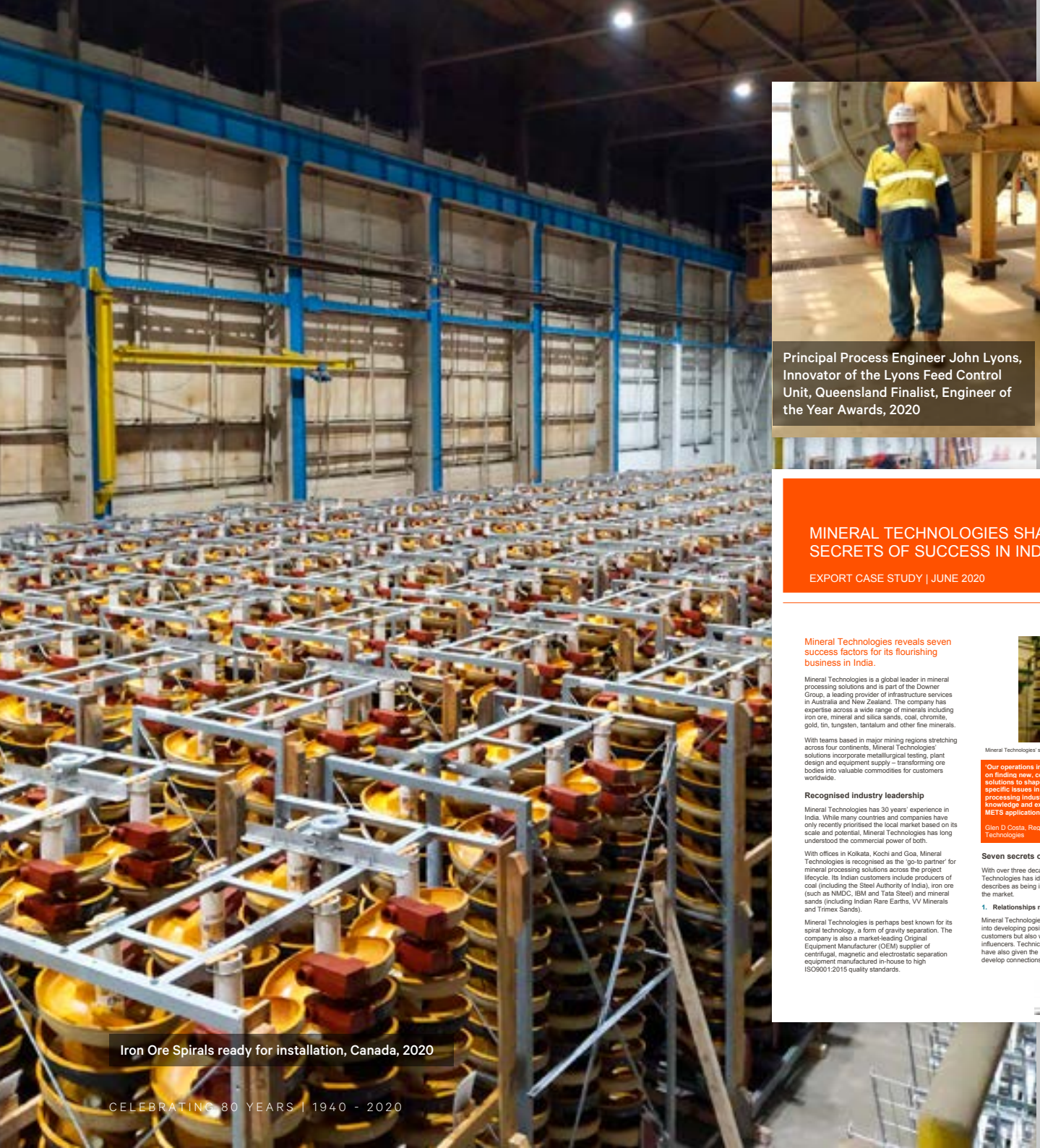
We are introducing Industry 4.0 technologies such as IoT connected sensors and devices, big data management and additive manufacturing to product ranges.

Australian Prime Minister, the Hon. Scott Morrison MP, visits Mineral Technologies, 2020

We are also working in collaboration with leading universities and research funding centres as we start to revolutionise the way composite polymers are used to manufacture precision-engineered mineral separation parts.

Our global teams look forward to continuing to bring new technologies and innovation to help improve our customer's mineral processing operations for the next 80 years.

Alex de Andrade, General Manager and Thomas Romeijn, Mechanical Engineer, working on the additive manufacturing project and PhD research.



Iron Ore Spirals ready for installation, Canada, 2020

Principal Process Engineer John Lyons, Innovator of the Lyons Feed Control Unit, Queensland Finalist, Engineer of the Year Awards, 2020

Minister for Industry, Science and Technology Karen Andrews with female engineers, Australia, 2020

MINERAL TECHNOLOGIES SHARES SECRETS OF SUCCESS IN INDIA

EXPORT CASE STUDY | JUNE 2020

Mineral Technologies reveals seven success factors for its flourishing business in India.

Mineral Technologies is a global leader in mineral processing solutions and is part of the Downer Group, a leading provider of infrastructure services in Australia and New Zealand. The company has expertise across a wide range of minerals including iron ore, mineral and silica sands, coal, chromite, gold, tin, tungsten, tantalum and other fine minerals.

With teams based in major mining regions stretching across four continents, Mineral Technologies' solutions incorporate metallurgical testing, plant design and equipment supply – transforming ore bodies into valuable commodities for customers worldwide.

Recognised industry leadership

Mineral Technologies has 30 years' experience in India. While many countries and companies have only recently prioritised the local market based on its scale and potential, Mineral Technologies has long understood the commercial power of both.

With offices in Kolkata, Kochi and Goa, Mineral Technologies is recognised as the 'go-to partner' for mineral processing solutions across the project lifecycle. Its Indian customers include producers of coal (including the Steel Authority of India), iron ore (such as NMDC, IBM and Tata Steel) and mineral sands (including Indian Rare Earths, VV Minerals and Trimex Sands).

Mineral Technologies is perhaps best known for its spiral technology, a form of gravity separation. The company is also a market-leading Original Equipment Manufacturer (OEM) supplier of centrifugal, magnetic and electrostatic separation equipment manufactured in-house to high ISO9001:2015 quality standards.

Mineral Technologies' signature spiral separating technology

'Our operations in India have always focused on finding new, cost-effective and innovative solutions to shape the future, and tackle specific issues in the Indian mineral processing industry by drawing from the knowledge and expertise of modern Australian METS applications.'

Glen D Costa, Regional Manager – India, Mineral Technologies

Seven secrets of success

With over three decades in India, Mineral Technologies has identified seven factors it describes as being important to its achievements in the market.

1. **Relationships matter**

Mineral Technologies has invested time and energy into developing positive relationships – not just with customers but also with a broad range of industry influencers. Technical presentations at conferences have also given the company an opportunity to develop connections.

Austrade India Case Study, 2020

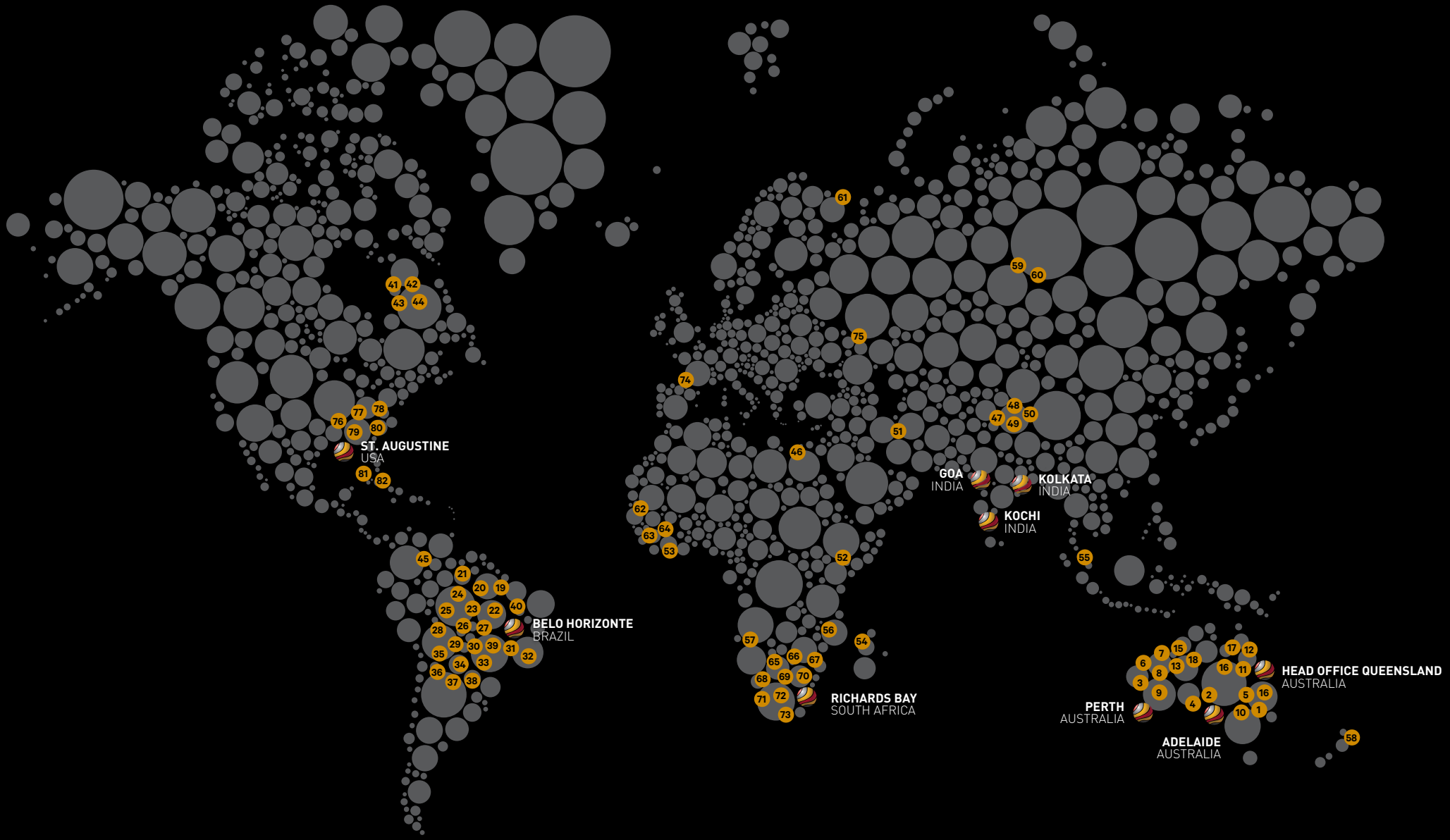
New spiral banks specifically designed to replace the Cone concentrators installed at New Zealand Steel operations in the 1980s

2020s

3D Image, Mobile Mining Unit

Members of Mineral Technologies North America onsite, USA, 2020

Mobile Mining Unit, USA, 2020


ST. AUGUSTINE
USA
BELO HORIZONTE
BRAZIL
RICHARDS BAY
SOUTH AFRICA
GOA
INDIA
KOCHI
INDIA
KOLKATA
INDIA
PERTH
AUSTRALIA
ADELAIDE
AUSTRALIA
HEAD OFFICE QUEENSLAND
AUSTRALIA

Major Projects

AUSTRALIA

1	Australian Tin Resources	Tin
2	Iluka Resources	Mineral Sands
3	Keysbrook Mineral Sands	Mineral Sands
4	OneSteel	Iron Ore
5	Bemax Resources	Mineral Sands
6	Gwalia	Tin, Tantalum
7	Tiwest Joint Venture	Mineral Sands
8	BHP Titanium Minerals	Mineral Sands
9	AMC Eneabba West	Mineral Sands
10	Mineral Deposits Limited	Mineral Sands
11	Queensland Titanium Mines	Mineral Sands
12	Consolidated Rutile Limited	Mineral Sands
13	BHP Iron Ore	Iron Ore
14	Fortescue Metals Group	Iron Ore
15	Ardlethan Tin	Tin
16	Cape Flattery Silica Mines	Silica
17	Associated Minerals	Mineral Sands
18	Westralian Sands	Mineral Sands

BRAZIL

19	José Mendes Mineração - JMN	Iron Ore
20	Mineração Metais LTDA – MML	Iron Ore
21	Mineração Morro Ipê	Iron Ore
22	SAFM	Iron Ore
23	MBPD	Rutile
24	Magnesita	Chrome
25	MIB - Mineração Ibirité	Iron Ore
26	USIMINAS	Iron Ore
27	Multitécnica	Manganese
28	Taboca SA	Tin, Tantalum
29	London Mine	Iron Ore
30	CSN	Iron Ore
31	Anglo Ferrous American	Iron Ore
32	GERDAU	Iron Ore
33	MINERITA	Iron Ore
34	Herculano Mine	Iron Ore
35	J. Mendes	Iron Ore
36	VALE	Iron Ore
37	AVG	Iron Ore
38	Millennium Inorganic Chemicals	Mineral Sands
39	AMG Mineração	Tantalum
40	Ferbasa	Chrome

CANADA

41	ArcelorMittal	Iron Ore
42	Wabush Mines	Iron Ore
43	Iron Ore Company of Canada	Iron Ore
44	Quebec Iron Ore	Iron Ore

COLOMBIA

45	MILPA	Coal

EGYPT

46	Egyptian Black Sand Company	Mineral Sands

INDIA

47	Trimex	Mineral Sands
48	IRE (Chavara)	Mineral Sands
49	Bhushan Power and Steel	Iron Ore
50	JSW Steel	Iron Ore

IRAN

51	IMIDRO	Mineral Sands

KENYA

52	Base Titanium	Mineral Sands

LIBERIA

53	ArcelorMittal	Iron Ore

MADAGASCAR

54	QMM	Mineral Sands

MALAYSIA

55	Terengganu Silica Consortium Sdn Bhd	Silica

MOZAMBIQUE

56	Kenmare Resources	Mineral Sands

NAMIBIA

57	Namdeb Diamond Corp	Diamonds

NEW ZEALAND

58	New Zealand Steel Limited	Iron Ore

RUSSIA

59	OAO TGOK Ilmenite	Mineral Sands
60	Mikhailovsky	Iron Ore
61	Kovdorsky GOK	Mineral Sands

SENEGAL

62	Grande Côte Operations	Mineral Sands

SIERRA LEONE

63	Tonkolili Iron Ore (SL) Limited	Iron Ore
64	Sierra Rutile Ltd	Heavy Mineral Concentrate

SOUTH AFRICA

65	Samancor	Chrome
66	Namakwa Sands Ltd	Mineral Sands
67	Iscor Heavy Minerals	Mineral Sands
68	Richards Bay Minerals	Mineral Sands
69	Tronox	Mineral Sands
70	Anglo Coal	Coal
71	Exxaro	Coal
72	Palabora Mining Company	Zircon
73	Anglo American	Mineral Sands

SPAIN

74	Advanced Mineral Processing	Various Minerals

UKRAINE

75	Motronovsky	Mineral Sands

USA

76	Southern Ionics Inc	Mineral Sands
77	Twin Pines Minerals	Mineral Sands
78	Chemours	Mineral Sands
79	TE Consolidated	Mineral Sands
80	Mineral Recovery Systems	Mineral Sands
81	RGC (USA) Mineral Sands	Mineral Sands
82	Dupont	Mineral Sands

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Relationships creating success

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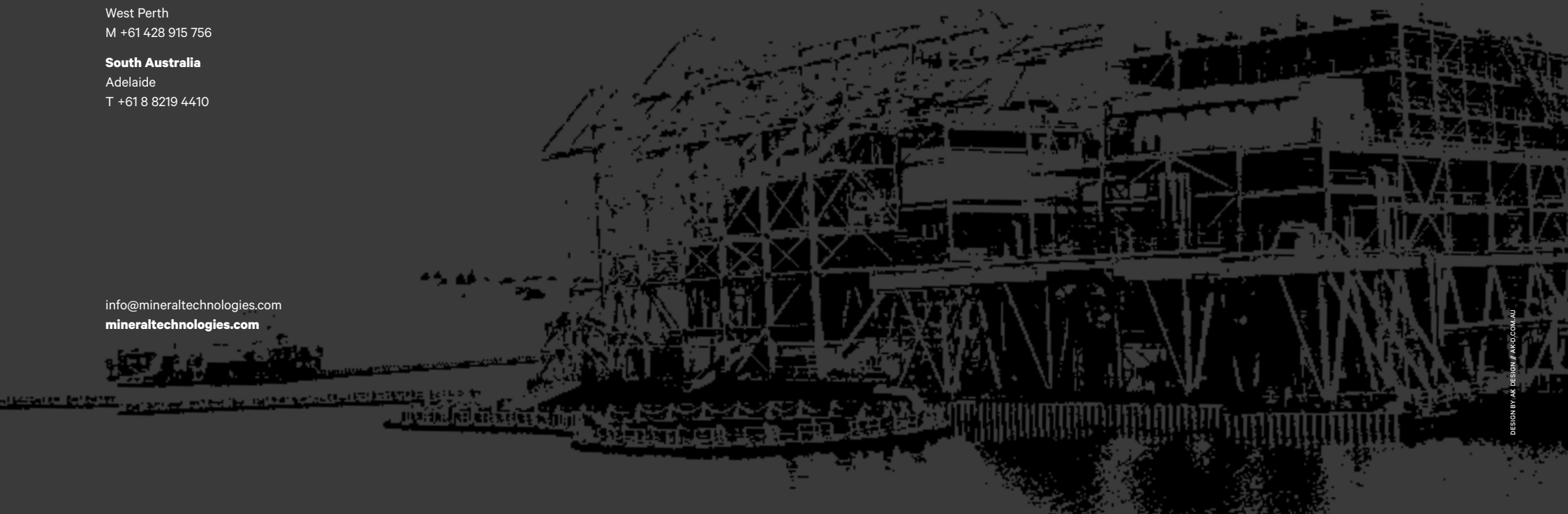

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