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# Weekly Commentary

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The Mining Investment Experts

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Chart comments at Friday's close

# **Chrysos and Portable PPB - making money out of assays**

Our markets rallied strongly last week as they sought to catch up from a position where they had been lagging. Hopefully that catch-up phase will continue into January, meaning a strong start to the New Year.

Thematics drive markets because they appeal to the emotive side of our characters. It is easier to quote story lines than wade through numbers, which are invariably flawed, anyway. They can drive markets a long way but invariably they run out of puff when delivery falls short. One way to consistently make money in markets is to identify the themes that move money and go with the flow, but you have remember to sell before everyone else.

The latest thematic that is quickly running out of puff is the drive to renewables. Every week we are seeing a retreat from the previous enthusiasm as economic reality starts to bite. Supply issues and rising costs are puting a brake on the renewables sector. The long expected rise in commodity input prices hasn't eventuated and in fact, prices have collapsed e.g. lithium and rare earths. How could so many people have called it wrong? The answer is in the thematics. Sure, Chinese shenanigans will have something to do with it, but it also highlights the dangers in group thinking.

As we go into 2024, with US stock markets reaching all time highs, it is difficult to see what the driving thematic will be. Maybe it is just good old fashioned economic growth and that will be boosted by the dovish sentiment on interest rates. Markets should rise as a result, being in the inverse of what was predictable when interest rates started to rise. In the absence of some exogenous shock to the markets ... a Black Swan event ... 2024 is looking like it will steadily improve.

The desperate selling of 2023 is behind us. There are still plenty of junior zombie stocks out there with no investment or speculative merit, and others that had grandiose plans to develop new projects that are now struggling with reality. So the challenge is to find those that have a new story, the telling of which will encourage buying.

## New assaying companies - Chrysos & Portable PPB

We introduced **Portable PPB Pty Ltd** to readers in the 12 August 2023 issue, being a company that has been exclusively licenced by the CSIRO to commercialise the detectORE<sup>TM</sup> assaying process. This overcomes the problem of obtaining low level gold results by pXRF analysis, using a patented process and single shot consumable. (http://www.fareastcapital.com.au/imagesDB/newsletter/WeeklyComm12August2023.pdf)

PPB offers a number of advantages over the existing assaying method whereby the samples have to be shipped off to laboratories for analysis. That takes time and money and as Tom Petty said "the waiting is the hardest part".

detectORE is capable of being used anywhere, without the need for skilled labour. A facility can be set up in a matter of hours. Sample sizes are about 500 gms.

An added benefit is that the process tells you how much of the gold is extractable i.e. it will only report extracted gold, not refractory gold like what plagued Ampella in Burkina Faso. It works on oxide and fresh rock quite well, but gives an early warning sign if the gold is refractory.

Recall that about 12 years ago Ampella found 3 Moz of gold and reached a market capitalisation of around \$320m. It sat on the news that the orebody was refractory for many months - I'll leave you to guess why - and the share price subsequently collapsed. The project was eventually sold to Centamin for a paltry \$20m, and the orebody is still not developed today. Companies will have no excuse to spentd millions of dollars on drilling, only to subsequently discover they have a metallurgical problem, if they use the detectORETM assaying process.

Orebodies often have a number zones that perform differently in a process plant e.g. in oxide, transitional and fresh rocks, but there can also be zones affected by the chemistry of the rocks into which it is first injected. As an example the detectORE process was tested on a newly discovered four million ounce orebody. About 85% of the assays recovered 60-70% of the contained gold in six hours, but the the remaining assays struggled to achieve a result. That was an early warning that there was a refractory component to the orebody.

Chrysos Corporation IPO'd in May 2022, having raised \$183m at \$6.50 a share. At first it seemed as if it was priced horribly wrongly with the share price crashing to a low of \$2.90 in December 2022, but since then there has been a strong recovery that has seen the shares trading above \$8.00 recently. Today it is capitalised at around \$900m, having raised another \$75m in November, at \$6.60 per share.

Chrysos is operating at the other end of the scale to PPB. Its PhotonAssay™ method that gives a total analysis requires 80 tonnes of equipment and access to a 10 MW power source. It is obviously not portable. The assaying job can take about two hours per sample, but first you have to get the sample to the laboratory. Just as with fire assays, the samples can be sitting around for weeks in a queue.

The business model of Chrysos is very different to that of Portable PPB as it plans to lease its rather expensive equipment. These cost \$3-4m each and the manufacturing obviously has to be financed by Chrysos itself.

#### Which process is better?

In reality the two process are complementary. There is a market for both. The greatest differences relate to time and location. You have to get a sample to a Chrysos facility but detectORE can be taken to the drilling location in remote areas. It can run on solar power and it provides the added

information on the leachability of gold from day one. Client assays costs for both methods are similar, but when time is money, detectORE comfortably wins out.

#### Is public or private better?

After the initial rocky start, Chrysos is showing us the greatest benefit of an ASX listing (part from access to greater finance). The share price is a reflection of the enthusiasm management has generated based on anticipation of future sales growth. The shares are selling on a massive prospective PE multiple, but traders can take advantage of this and cash out well ahead of actual delivery. That circumvents delivery risk. Every piece of positive news contributes to the momentum in the share price, but where will it peak? Whether the future success is now fully factored into the \$900m price tag today is open to debate. Will the upwards momentum continue, or will the chart roll over at some point.

It has been said to me that the total addressable market for the Chrysos units is around 600. By mid 2024, the Company expects to have 38 units operating to generate revenue of \$48-58m p.a. Research released by Bell Potter last month estimates net profit after tax of -\$0.5m in 2024 FY, \$7.3m in 2025 and \$13.6m in 2026.

How long will it take to reach the larger number, and what capital is required considering the manufacturing costs are up to \$4m each. We could easily be talking hundreds of millions of dollars. The recent \$75m raising is just the start of the curve. Chrysos has the capacity to manufacture 10 assays p.a., that means it will be spending \$40m p.a. for many years.

Turning to PPB, the numbers are much less daunting but nevertheless very profitable. Current capacity is currently 600,000 assays p.a. (i.e. 600,000 assays). This could generate \$7m p.a. in revenue with a high margin that could provide a gross profit margin of better than \$5m p.a. An expansion to three million units p.a. would only cost \$300,000 but that could boost revenue to more than \$30m p.a. and a gross profit margin of around \$24m. That could be achievable within 3-4 years.

PPB believes the total addressable market is \$300m or 30-40 million units p.a., suggesting a lengthy growth curve awaits the company. You can calculate what earning may be, for each 10% increment of market share. This is targeting exploration resource definition and grade control drilling where up to 200 assays per day may be required on location. Once you get to 300 assays per day, the fire assay method starts to become economical.

#### Portable PPB currently raising \$400,000

PPB is still a private company. While it may decide to do an IPO, attracted by the premiums that we are seeing in Chrysos's share price, it may be happy to stay private and eventually look for a trade sale as an exit strategy. In the meantime it is looking to raise a modest \$400,000 to supplement working capital, on a pre-money valuation of \$18.4m. This is a tiny fraction of what Chrysos is capitalised at today.

This could be suitable for patient investors happy to sit for a few years. Feel free to contact Far East Capital Limited if you want to consider making an investment and we will supply you with a company specific presentation (s708 investors only).

#### Positive perspectives on South Africa

As we have observed previously, South Africa tends to be shunned by investors in favour of higher risk African countries. This doesn't make sense as it defies objective analysis that points to an advanced mining culture and the best infrastructure on the continent, which should make investment decisions easier. It also has one of the best working democracies in Africa. There is clearly a negative prejudicial attitude towards South Africa.

Last week I met with Roger Baxter, the recently retired CEO of the Minerals Council South Africa. Roger provided some encouraging perspectives regarding recent changes in the way things are working over there.

Starting with a commentary on the four recent South African Presidents, Nelson Mandela was undisputedly a great leader who handled the transition from white to black power rule over an eight year period. This was a period of high antagonism but it was managed well by Mandela as the economy was stabilised with good economic management. That good management was continued by Thabo Mbeki as he contended with the GFC.

However, everything took a turn for the worse when Jacob Zuma took over the reins. Corruption became the order of the day and debt levels blew out dramatically. Cyril Ramaphosa became President and has started the reversal of the Zuma years, but the correction is taking longer than the slump. Nevertheless, there seems to be more constructive engagement with business now.

The political reality is that the younger population in South Africa, called the "Born Frees", have never experience apartheid. They are more concerned with economic advancement than black power struggles and they are the reason why observers expect the ANC vote to fall below 50% at the next election, in 2024. That is causing the government to be more responsive to the changing agenda. It is called political preservation.

We have frequently heard of the power supply problems and the load shedding that has hampered South Africa in recent years, owing to the corruption in ESKOM. In response, the private sector has been engaging with the bureaucrats to address the issues. An Energy Reform Commission has been formed, comprising three persons, that has already started to oversee improvements on many fronts.

Much of the Western World went through privatisation processes in previous decades, taking inefficient government owned enterprises and selling them to private organisations in a quest for greater effficiency. That is starting to happen in South Africa, a country known for centralised, State run enterprises. Over the last two years the private sector has become much more pro-active and the driver of changes, seconding engineers and experienced personal to upgrade management in areas such as power generation and rail logistics.

The Mineral Council took the Black Economic Empowerment (BEE) system to court, objecting to the open ended BEE system whereby the BEE ownership levels had to be refreshed on renewal of mining licences. That led to a judgement that "once empowered, always empowered". If a Black Empowered group wants to sell its interest in a company/project, there is no longer

requirement to subsequently re-instate Black ownership levels at a later event. The Minister of Mines has agreed not to appeal the decision.

So, the bottom line is that things are changing in South Africa, for the better. Adam Smith's invisible hand is starting to take effect with a government that is becoming more responsive to the needs of the electorate, and business and government is starting to work together to overcome issues that were too great for an inexperienced bureaucracy. It will never be perfect, just as Australia is never perfect, but business conditions are improving.

## COP struggling to achieve deliverables

I was puzzled to hear that COP28 has made a positive step forward by agreeing to move away from fossil fuels. That is being reported as a major positive breakthrough.

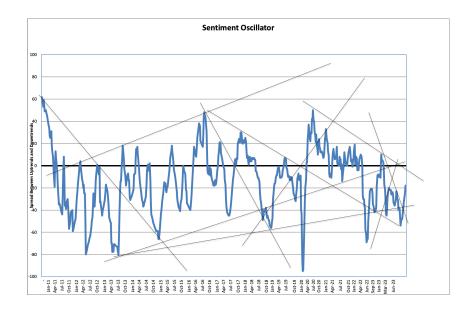
Hang on; what has the last 10 years been all about? Hasn't that been all about renewable energy from wind, solar and anything else that is not from carbon releasing fossils fuels. For all the hot air coming out of the renewable movement I

find it curious that we are back at Go, like we have done a full circuit of the playing board.

The other word featuring on the news was "adaptation". Not only must we move towards alternative energy but we must also have "adaptation". Well, I thought this would have been obvious. It is fine to be saying that but there are a number of supply issues concerning input materials. Why don't they address these? Why don't they promote the necessary mining developments?

The elephant in the room continues to be the reluctance to embrace nuclear energy more effectively, or even talk about it. Now that would be serious progress!

We have added Alligator Energy (AGE), Averina (AEV), Besra Gold (BEZ), Nexgen Energy (NXG) and Paladin Energy to our chart coverage.



**Sentiment Oscillator:** Sentiment continues to improve as markets recover. There were 23% (24%) of stocks in uptrend and 41% (51%) in downtrend at the close of the week.

## **Detailed Chart Comments**

NB. Only the bold comments have been updated. Comments in grey type are from previous weeks and will be less relevant. Please note that this list is a cross section of the market. It IS NOT a list of recommendations.

Indices	Code	Trend Comment	
All Ordinaries	XAO	strongly higher	
Metals and Mining	XMM	breached downtrend	
Energy	XEJ	testing downtrend	
Information Technology	XIJ	breaching downtrend	
Stocks	Code	Trend Comment (updated comments in bold)	Main Interest
Aurora Energy Metals	1AE	sideways through downtrend	uranium

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5EA Advanced Materials	5EA	another new low	boron
92 Energy	92E	rising	uranium
Alpha HPA	A4N	strong recovery	HPA
Adriatic Resources	ADT	slump through support line	zinc, polymetallic
Advance Metals (was Pacific American)	AVM	back to lows	coal, gold exploration
Aguia Resources	AGR	at lows	phosphate, copper exploration
Alkane Resources	ALK	down	gold
Alicanto Minerals	AQI	back to lows	base metals, silver, gold
Alligator Energy	AGE	testing uptrend	uranium
Almonty Industries	AII	breached downtrend	tungsten
Altech Chemical	ATC	sideways	HPA, anodes
Alto Metals	AME	at lows with a placement	gold exploration
American Rare Earths	ARR	sideways	rare earths
Anax Metals	ANX	breached downtrend	copper
Anteotech	ADO	new low on placement	silicon anodes, biotech
Antilles Gold	AAU	new low	gold and copper expl.
Arafura Resources	ARU	new low	rare earths
Ardea Resources	ARL	secondary downtrend	nickel
Arizona Lithium	AZL	breached downtrend	lithium
Astral Resources	AAR	rising	gold
Averina	AEV	sideways	phosphate
Aurelia Metals	AMI	breaching downtrend	gold + base metals
Australian Rare Earths	AR3	new low	rare earths
Australian Strategic Materials	ASM	continuing lower	rare earths
Azure Minerals	AZS	another surge higher then pullback	nickel exploration
BHP	ВНР	surge higher	diversified, iron ore
Barton Gold	BGD	rising	gold exploration
Beach Energy	ВРТ	breached uptrend	oil and gas
Bellevue Gold	BGL	new high	gold exploration
Besra Gold	BEZ	recovering from lows	gold
Black Cat Syndicate	BC8	steep rally	gold
BMG Resources	BMG	down	gold exploration
Boab Metals	BML	rising	silver/lead
Cadoux (was FYI)	ССМ	testing steepest downtrend	HPA
Calidus Resources	CAI	testing downtrend	gold
Caravel Minerals	CVV	strong rally	copper
Carnaby Resources	CNB	breached downtrend	copper
Castile Resources	CST	back to lows	gold/copper/cobalt
Cazaly Resources	CAZ	back to downtrend	rare earths
Celsius Resources	CLA	sideways	copper
Cobalt Blue	COB	down again	cobalt
	СУМ		
Cyprium Metals		forming a base	copper
Dateline	DTR	down	rare earths
Ecograf	EGR	turning down at resistance line	graphite

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Emerald Resources	EMR	rising, new high	gold
Empire Energy	EEG	rising	gas
EQ Resources	EQR	breached uptrend	tungsten
Euro Manganese	EMN	testing downtrend	manganese
Evolution Energy	EV1	new low	graphite
Evolution Mining	EVN	rising again	gold
First Graphene	FGR	breached uptrend	graphene
Fortescue Metals	FMG	new high	iron ore
Galena Mining	G1A	new low	lead
Genesis Minerals	GMD	new high	gold
Genmin	GEN	suspended	iron ore
Gold 50	G50	down	gold exploration + gallium
Great Boulder Resources	GBR	new low	gold exploration
Group 6 Metals	G6M	down	tungsten
Hamelin Gold	HMG	testing downtrend	gold exploration
Hastings Technology Metals	HAS	back to lows	rare earths
Hazer Group	HZR	breached steepest downtrend	hydrogen
Heavy Minerals	HVY	down	garnet
Hillgrove Resources	HGO	rising gently	copper
Iluka Resources	ILU	heavy fall	mineral sands
ioneer (was Global Geoscience)	INR	down	lithium
Ionic Rare Earths	IXR	breached downtrend	rare earths
Jervois Mining	JVR	rising	nickel/cobalt
Jindalee Lithium	JLL	new low	lithium
Kaiser Reef	KAU	new low	gold
Krakatoa Resources	KTA	surge on lithium drilling	rare earths
Kingfisher Mining	KFM	breached downtrend	rare earths
Lepidico	LPD	improving	lithium
Lindian Resources	LIN	testing downtrend	rare earths + bauxite
Lion One Metals	LLO	surge out of downtrend	gold
Li-S Energy	LIS	new low	Lithium sulphur battery technology
LCL Resources	LCL	back to lows	gold exploration
Lotus Resources	LOT	rising	uranium
Lucapa Diamond	LOM	sideways	diamonds
Lunnon Metals	LM8	new low	nickel
Lynas Corp.	LYC	still down	rare earths
Marmota	MEU	surged higher	gold exploration
Matador Mining	MZZ	breached downtrend	gold exploration
Mayur Resources	MRL	back in uptrend	renewables, cement
Meeka Gold	MEK	down	gold
MetalsX	MLX	down	tin, nickel
Meteoric Resources	MEI	off its high	rare earths
Metro Mining	ММІ	sideways	bauxite
Midas Minerals	MM1	slump	lithium

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Nagambie Resources	NAG	breached downtrend	gold, antimony
Neometals	NMT	new low	lithium
Newfield Resources	NWF	down	diamonds
Nexgen Energy	NXG	rising	uranium
Northern Star Res.	NST	rising	gold
Nova Minerals	NVA	spiked higher	gold exploration
Pacific Gold	PGO	breached short term uptrend	gold exploration
Paladin Energy	PDN	sideways through downtrend	uranium
Pantoro	PNR	breached downtrend	gold
Patriot Battery Metals	PMT	breached uptrend	lithium
Peak Resources	PEK	new low	rare earths
Peninsula Energy	PEN	collapse on \$60m raising	uranium
Perseus Mining	PRU	rising again	gold
Poseidon Nickel	POS	collapse	nickel
Provaris Energy	PV1	turning down	hydrogen
QMines	QML	new low	copper
Queensland Pacific Metals	QPM	long term down	nickel/cobalt/HPA
RareX	REE	breached downtrend	rare earths, phosphate
Regis Resources	RRL	breached steepest downtrend	gold
Renergen	RLT	strong bounce from lows	gas, helium
Richmond Vanadium	RVT	heavy fall on release of escrowed shares	vanadium
RIO	RIO	rising again	diversified, iron ore
Rumble Resources	RTR	secondary downtrend	gold exploration
S2 Resources	S2R	sideways	gold exploration
Sandfire Resources	SFR	sideways through downtrend	copper
Santos	STO	weaker	oil/gas
Sarama Resources	SRR	at rock bottom	gold exploration
Sarytogan Graphite	SGA	new low	graphite
Siren Gold	SNG	new low	gold exploration
South Harz Potash	SHP	testing downtrend	potash
Southern Cross Gold	SXG	surge higher	gold exploration
Southern Palladium	SPD	breached downtrend	PGMs
Stanmore Coal	SMR	new high	coal
Strandline Resources	STA	suspended	mineral sands
Sunstone Metals	STM	meeting resistance line	gold/copper exploration
Suvo Strategic Minerals	SUV	sideways	kaolin
Talga Resources	TLG	heavy fall	graphite
Tamboran Resources	TBN	improving	gas
Technology Metals	ТМТ	down	vanadium
Theta Gold Mines	TGM	strong rise	gold
Thor Energy	THR	back into downtrend	uranium
Tietto Minerals	TIE	surge on takeover approach	gold
Vanadium Resources	VR8	drifting lower	vanadium
Venture Minerals	VMS	down	tin, tungsten

Vintage Energy	VEN		breached downtrend	gas
Voltaic Strategic Resources	VSR		new low	REO + lithium
West Cobar	WC1		breaching downtrend	rare earth + lithium
Westgold Resources	WGX		new high	gold
West Wits Mining	WWI		sideways	gold
Whitehaven Coal	WHC		testing downtrend	coal
Xantippe Resources	XTC		down	lithium
Zenith Minerals	ZNC		strong rise	gold exploration
Totals	23%	32	Uptrend	
	41%	58	Downtrend	
		140	Total	

#### **Guides to Chart Interpretations**

- Charts usually go pass from one trend (up or down) into the other via a period of indecision and uncertainty during which the trend can either recover or change. This period is signified by the orange colour. The orange represent both the greatest risk and greatest reward possibilities.
- Once a chart is in confirmed up or downtrends it is not uncommon for 10-20% of that trend to have already transpired.
- There are trends within trends. The focus of this chart review is the immediate trend that affects the sentiment i.e. it can be a downtrend within a long-term uptrend.
- · Not every chart warrants a new comment every week. The new comments are in bold type. Grey type comments may be dated.
- Individual charts provide a single view. It is valuable to look at charts of other companies in similar commodities, and the overall sentiment is also very
  valuable. Not many stocks can swim against the tide.
- We periodically add or delete charts, some times for obscure reasons. If a chart consistent gives poor signals or is very erratic, we may delete it. Sometimes we add a chart because we want to see what all the fuss is about. We do have a preference for charting stocks that we cover in our research as well.
- Errors and omissions may occur from time to time, especially in fast moving markets.

Amber Lights in Tables: Just a reminder if when the amber light is used in the table – it is when the charts are ambiguous or when there is a change of trend taking place. If a chart is breaching a downtrend it can either be a positive sign or a trap. Only once it has done more work can it be confirmed as a new uptrend. Maybe it is a new uptrend (or conversely a new downtrend); the risk takers can decide to jump on board early (or sell). They will maximise their profits (or minimise their losses if indeed it is the start of the new uptrend (downtrend). More risk-averse investors should wait a little longer, being prepared to give up some of the gains in return for greater certainty.

Weightings of Sectors Represented in the Company Charts					
Sector	No. of Companies	Weighting			
Gold Exploration	19	13.6%			
Gold	19	13.6%			
Rare Earths	15	10.7%			
Lithium	10	7.1%			
Copper	9	6.4%			
Uranium	9	6.4%			
Oil/Gas	8	5.7%			
Nickel	6	4.3%			
Iron Ore/Manganese	5	3.6%			

Graphite/graphene	5	3.6%	
Silver	4	44.4%	
Tungsten	3	2.1%	
Mineral Sands	2	1.4%	
Vanadium	3	33.3%	
Zinc/Lead	2	1.4%	
Coal	2	1.4%	
Potash/Phosphate	3	2.1%	
Bauxite	2	1.4%	
Tin	2	1.4%	
Cobalt	1	0.7%	
Diamonds	2	1.4%	
Other	9		
Total	140		

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