



Brent Cook's
Exploration Insights
Turning Rocks Into Money

Exploration Insights

by Brent Cook and Joe Mazumdar

August 6, 2017

Alert: Buying Novo Resources (NVO.V)—Previous close at C\$2.82

In the beginning, life created gold



(Photomicrograph of filamentous gold from Carbon Leader, Witwatersrand Deposit South Africa. Micro particles of gold are imbedded between carbon remains of blue-green algae columns formed about 2.7-2.9 billion years ago. The Witwatersrand Basin sediments are responsible for a third of the world's total production)

Field notes from Novo Resources' Karratha Project, Western Australia

By Brent Cook

<http://www.novoresources.com>

Shares Outstanding: 117 million

Share Fully Diluted: 158 million

Market cap: C\$324 million (C\$437 million fully diluted)

Cash: ~C\$15 million (in-the-money warrants bring in ~C\$30 million)

Last financing: May 24, 2017, C\$15 million @ C\$0.66 w/ warrant @ C\$0.90

Major shareholders: Eric Sprott ~9.9 million, Newmont ~18 million, Mark Creasy ~11 million, Quinton Hennigh ~3 million.

Summary

Novo Resources has claimed or optioned over 9,000 km² of ground prospective for conglomerate-hosted gold mineralization in the Pilbara region of Western Australia. I spent two days (August 2 and 3) touring the property and emphasize a few important points below:

1. We are in the very early stages of exploring and testing the conglomerate-hosted gold mineralization, and I have to say this is one of the strangest geologic settings I have ever seen. I don't know for certain how it formed or how big it is; neither does anyone else at this point. It does however appear to be some variant of a Witwatersrand style gold deposit.
2. Outlining areas of better mineralization will take detailed mapping and sampling: time, lots of it. Defining grade and tonnes to a bankable feasibility level will be extremely difficult, if not impossible. Any resource will require large-diameter drilling, channel/trench sampling, and bulk test mining.
3. The concept that viable economic mineralization occurs over tens or even hundreds of kilometers is legitimate but unproven. The conglomerate-hosted gold mineralization could turn out to be a truly world class deposit, or one very large geochemical anomaly and playground for metal detectorists. We just don't have enough hard data to make a definitive assessment.
4. Expect extreme volatility in Novo's share price as positive or negative results and rumors come out. Given the potential size of the prize, we should anticipate claim jumpers, liars, scumbags, and all the snakes and sharks that greed and gold bring out.

Since the July 12 news release, the share price action and resultant market valuation of C\$324 million has been predicated on what amounts to some scattered surface samples and a really big idea—this is irrational to the extreme. Consider that we know little to nothing about grade, continuity, extent or genesis; and we don't even have a feel for how to evaluate this thing—crazy. But when the sky's the limit, market cap doesn't matter—until it does.

Nonetheless, the concept that Archean conglomerate-hosted gold mineralization at Karratha is a Witwatersrand equivalent is legitimate. Gold is scattered across tens to hundreds of kilometers, and there is the real chance this could be a world class discovery. Hence, despite the high valuation and uncertainty, I am buying a small stake, with the expectation of lower entry prices in the future—assuming results warrant. I am “overpaying” for the opportunity—as much for the excitement and chance to be part of what could be a remarkable discovery as for making money. We will comment on relevant news and new data as it comes in.

First, a bit of background



(Figure 1: Three-year NVO share price)

On July 12, Novo announced the discovery of gold nuggets in a bulk sample extracted from Archean-aged (~2.7 billion years old) conglomerates at its Purdy's Reward property near Karratha, Western Australia. The release included [links](#) to videos of local fossickers or prospectors finding gold with metal detectors. The share price jumped from C\$0.96 to C\$1.49, and has subsequently closed as high as C\$3.01, (Fig. 1). On July 15th I booked my flight to Australia, with a scheduled departure immediately after the Sprott Investment Conference in late July. Needless to say, a lot has happened to the share price during those two weeks.

Several newsletter writers have recommended Novo and its President Quinton Hennigh for years. Although the July 12 new release certainly created some strong buying of NVO, I think newsletter commentary also played a big part in taking it to \$3.00. In particular, Bob Moriarty, with his influential [321 Gold](#) website, has commented extensively on the company, detailing the ups and downs as it explored for [Witwatersrand](#) style gold deposits in Western Australia. [Jay Taylor](#) and the [Korelin Economics Report](#) have also been Novo backers for some time; and, recently, [John Kaiser Research](#) has published some very bullish notes on the new discovery. Photos and videos of the remarkable discovery, plus chat board discussions, have also influenced prices.

The presence of gold nuggets in the Purdy's area only came to light in September 2016. A local bloke was mustering (herding) cattle from a helicopter and noticed a small camouflaged camp where someone had been metal detecting and digging holes to recover the nuggets. He flew in, checked it out, and applied for a prospecting license with a local prospector. The license only allows them to work the surface to a few meters. They have recovered hundreds of ounces in large and small nuggets, (Fig. 2, below). Subsequently, the duo brought in a third partner and staked a couple of large exploration licenses covering the Comet Well area.

Novo recently struck deals with the trio for Comet Well and Artemis Resources (ARV.ASX) for Purdy's Reward. The Artemis ground around Purdy's Reward is a joint venture whereby NVO can earn 50% of all conglomerate/placer style mineralization by spending A\$2 million over two years; thereafter both parties contribute pro-rata. The Comet Well deal allows NVO to earn 80% by making staged payments and expenditures. We will worry about the details later.



(Figure 2: "Watermelon Seed" and alluvial [far right] nuggets from Purdy's. The gold is 96+% pure. The high purity makes it very unlikely that it came from a "normal" hard rock source. *Photo: Exploration Insights*)

Some recent history

Novo's President, Quinton Hennigh, has been chasing Witwatersrand style gold deposits around the globe since the mid-1990s, when, during his doctorate thesis research, he began the search for similar deposits and the genesis of this unique deposit type. However, Gold Fields (GFI.NYSE, GFI.JSE) cut his funding short and Quinton ended up finishing his thesis on the world-class Neves Corvo volcanogenic massive sulphide deposit in Portugal.

In the mid-2000s, Quinton joined Newmont and headed up a global search for Witwatersrand deposits that took him and his team to South Africa, Brazil, India, and Australia. That project was canned in 2007, and in 2010 Quinton acquired prospective Witwatersrand style ground in the Pilbara of Western Australia via Novo Resources. Between 2010 and last year, he and the company struggled with a falling market and various land and partner issues. Longtime EI readers will recall Quinton from a number of articles he contributed to your letter in 2012. One final note: in addition to being one of the best exploration geologists I know, Quinton is honest, sincere, and has always put shareholders first—we want him to win.

Although I have followed this story from the beginning, the stock has never been acquired by EI. Novo's first conglomerate-hosted gold discovery, Beatons Creek, looked marginal and difficult, and there was a battle always simmering between Novo and its neighbor Millennium Minerals (MOY.ASX). Novo wanted to generate cash flow by producing gold at Beatons Creek—a game plan we rarely buy into. However, all that history became irrelevant with the recognition of large tracts of gold at surface by local metal detectorists and the recognition of a gold bearing conglomerate source in the Karratha area by Novo.

Some ancient history

The Witwatersrand Basin in South Africa is the single largest gold district in the world, having produced ~1.5 billion ounces since its discovery in 1886. As exposed today, Witwatersrand style gold has been mined over a 300 km by 150 km area to depths of up to 4 kilometers. Simplistically, the gold occurs within specific sedimentary horizons across this extensive sedimentary basin. Although gold occurs in a number of horizons, it is primarily localized in a lower quartz pebble conglomerate and an upper polymictic conglomerate comprised of volcanic, intrusive, and sedimentary clasts (Ventersdorf Contact Reef).

The basin was part of Earth's first known craton (ancient continent) called Ur (Vaalbara) that is comprised of some of the oldest rocks on Earth (~2 to 3.6 billion years old). During the formation and existence of Ur, Earth's atmosphere evolved from a toxic, acid, anoxic mix to one dominated by oxygen. This oxygenation process, leading up to the Great Oxidation Event (~2.4 billion years), was the result of very primitive blue-green algae (cyanobacteria) that produced oxygen via photosynthesis.

The presence of oxygen in the atmosphere had dramatic effects on the climate (Huronian Glaciation), produced banded iron-oxide formations, life, and, according to Quinton (and others), the precipitation of gold out of the oceans (Quinton's technical paper will soon be posted on our website via the Geo-Insights tab, under Technical Papers). It's worth noting that gold production from Archean rocks exceeds production from all other, younger, rocks, globally, despite their limited extent, (Fig. 3).

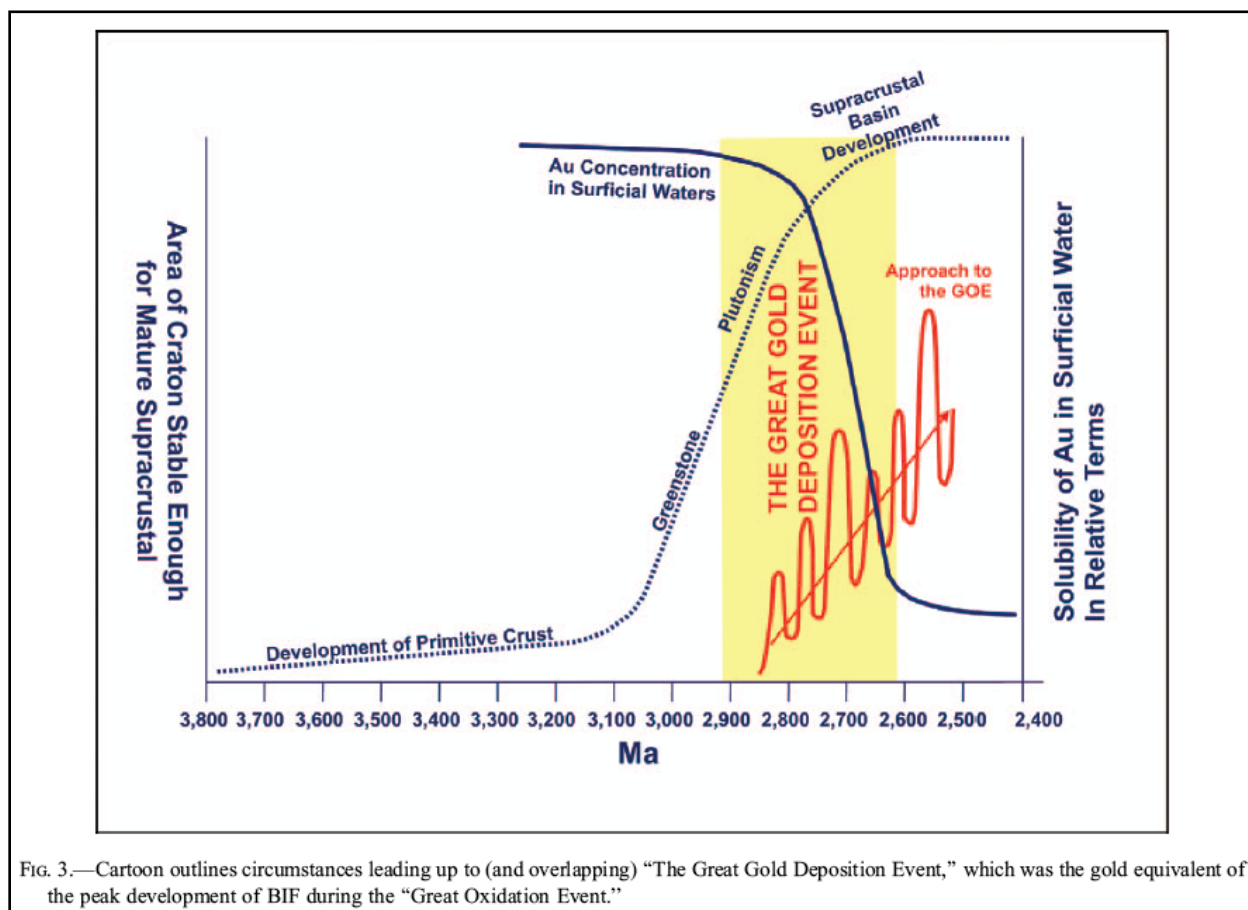
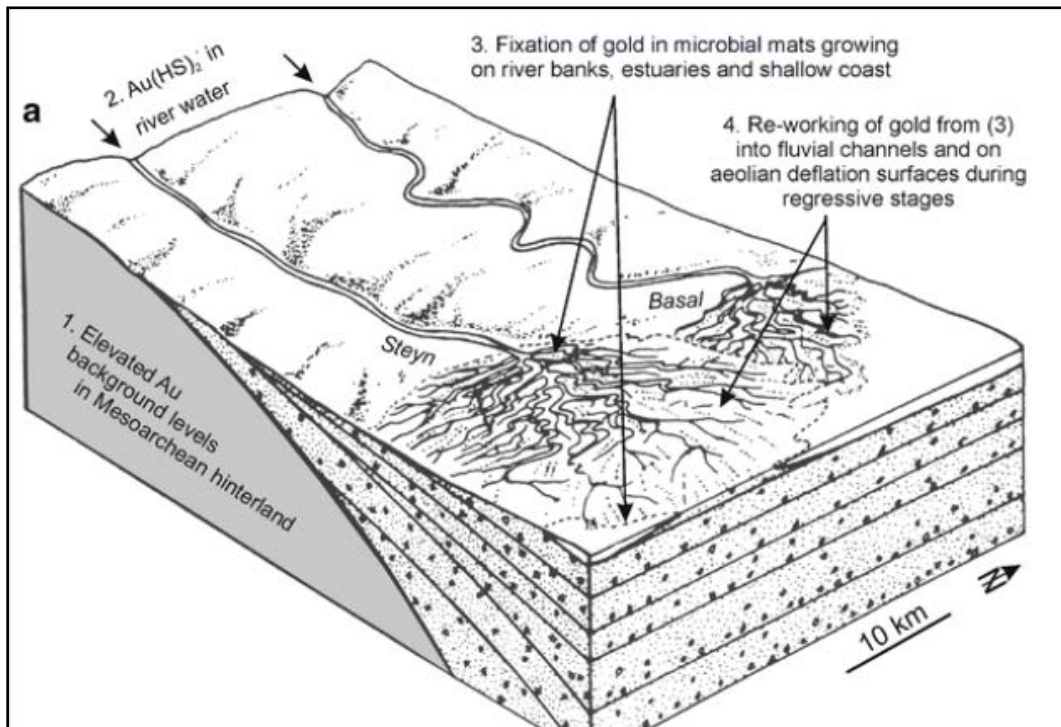


FIG. 3.—Cartoon outlines circumstances leading up to (and overlapping) “The Great Gold Deposition Event,” which was the gold equivalent of the peak development of BIF during the “Great Oxidation Event.”

(Figure 3: Gold concentration and solubility in surficial waters over time. *Source: Horscroft, Mossman, Reimer and Hennigh 2011*)

Specifically, Quinton’s Witwatersrand gold deposition model goes something like this: “Sea level rises, sedimentation slows, and gold is chemically precipitated out in microbial mats in shallow water or in situ, along with pyrite in stagnant gravel deposits offshore. Then, sea level falls, reactivating the entire sedimentary system and partially reworking the gold into more classic placer-type deposits, (Fig. 4). The earliest photosynthetic life on earth grabbed the gold out of seawater and held it in algal mats.”



(Fig. 4: Schematic block diagram illustrating depositional environment for gold formation and reworking into placer deposits. Source: Frimmel and Hennigh, 2015)

The biogenetic theory has always made sense to me, explaining away many of the obvious quandaries of a purely alluvial model for the Witwatersrand. Essentially, hydrogen sulfide acid rained down on the earliest continents, dissolving gold that collected in very nasty, gold-rich seas and lakes. Photosynthesis by shallow water algal bio-mats then pulled the gold out of solution and precipitated it in the bio-mats. For the chemistry geeks in the audience it goes something like this: $4\text{Au}(\text{HS})_2 + 15\text{O}_2 + 2\text{H}_2\text{O} = 4\text{Au} + 8\text{SO}_4^{2-} + 12\text{H}^+$. The resultant gold is very pure and fine grained unless re-worked into placer deposits.

What did we see in Western Australia?

In short, lots of watermelon seed-sized gold nuggets, found with metal detectors, immediately on top of, or adjacent to, a relatively primitive Archean conglomerate. Larger, truly alluvial, nuggets are found in washes and streams draining the conglomerate. There has been a surge in locals out detecting with metal detectors; they walk the ground listening for a beep that identifies a shallow nugget. Once found, they systematically circle out around the initial nugget, often coming up with hundreds to thousands of ounces from a small area. If this were West Africa, there would be thousands of miners ripping into the area—*guaranteed*.



(Fig. 5: Weekend warriors scraping ounces from the surface. I see a gold tooth in this lucky bloke's future. *Photo: Exploration Insights*)

One of the more successful surface miners is Rob Beeton (Fig. 6, below) who has been working a small patch at Novo's Comet Well for almost a year. Rob has brought in jackhammers, a small crusher, and a crew of five. He has recovered hundreds of ounces from surface and, more importantly, from the Archean bedrock conglomerate. Rob's work shows conclusively that watermelon seed-sized (and up to 4 cm long) nuggets are coming directly out of the conglomerate.



(Fig. 6: Quinton Hennigh in plaid shirt and Rob Beeton in Miami singlet at camp. Metal detector is to the right. *Photo: Exploration Insights*)

All the gold I saw across Novo's tenements was sourced directly from the conglomerates. This is not supergene gold or lag gold deposits—period. In fact, in 1909, the Western Australian government geologist commented on some gold bearing conglomerates at the basal Nullagine series (Archean sequence) and speculated that this formation could become a gold producer in other portions of the Nullagine. The outcrops he discussed occur near Egina, about 110 kilometers from Comet Well.

The zone most extensively worked by detectorists covers a 7-kilometer trend from Purdy's Reward to Comet Well. Fossickers have detected gold from numerous additional areas in the same geologic setting tens of kilometers away. Artemis Resources announced the discovery of gold from conglomerates on its 100% owned Mt Oscar property 15 kilometers away from Purdy's. Novo's Beatons Creek property has produced gold from stratigraphically equivalent conglomerates about 300 kilometers to the east.

Looking into the future

Novo has submitted an initial 700-kilogram bulk sample of bedrock conglomerate from the Purdy's prospect. The sample comes from a 2-meter by 2-meter by 1-meter deep trench into a conglomerate horizon at the top of an 11-meter thick stratigraphic unit. The sample was split into two sub-samples, each of which will be crushed then screened into three composites comprised of coarse visible gold, gravity recovered gold, and fine tails. Negrón Metallurgical Laboratory in Perth is performing the assays.

Visible nuggets were found in the sample, so expect some very high grades in the large fraction assay. However, the fine fraction assays are more important from a resource calculation and mining standpoint, as decent grades would make both considerably easier to access. A few kilometers away from this bulk sample, Rob Beeton has recovered gold from his waste tails, which suggest there may be very fine grained gold in the conglomerate matrix.

The company has begun a detailed mapping program, plus soil and BLEG (bulk leach extractable gold) sampling, and will continue taking bulk samples in the Purdy's and Comet Well areas. It also plans to bring in a wide diameter drill rig to begin testing the conglomerates in October. On a regional scale, Novo is waiting for the tenements to be granted; it can only conduct limited reconnaissance style work on many of the newer concessions at this point.

We don't have enough information to tie down anything concrete with regards to possible mining scenarios, but need to bear in mind that South Africa's manual underground mining method will not work in Australia. Certainly, the near surface mineralization can be open pit mined, with the economic strip ratio dependent on grade and mineralized horizon thickness.

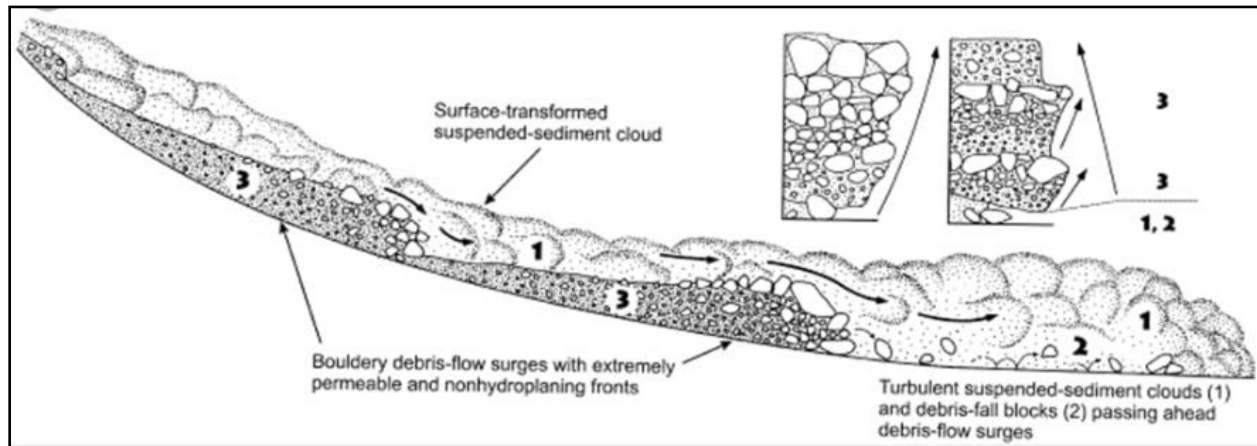
From what I saw, the mineralized horizon could be between 2 and 20 meters thick. The conglomerate dips between 10° and 20°, which would be fine for a bulk mining room and pillar operation *if* the grade is there. It is not possible to visually discern ore from waste without a metal detector; and given the likely grade and geologic variability, we should factor in 100% dilution.

Conclusions

There is no doubt in my mind that Novo Gold and Quinton Hennigh have identified a piece of Ur and a Witwatersrand type basin that covers thousands of square kilometers. Gold mineralization occurs in a regionally extensive conglomerate unit exposed across much of the Hamersley Basin in northwest Australia. A CRA Limited drill hole in the 1980s hit conglomerate at 1,756 meters that assayed 12 grams per tonne over one meter. The drill hole was 50 kilometers from Purdy's in the center of the basin—not conclusive evidence that it was the same conglomerate, but pretty darn interesting.

Based on my observations during this site visit and the limited available information, I suspect that the gold bearing conglomerates in the Karratha area may be similar, or equivalent, to the Ventersdorp Contact Reef in South Africa. The 2.715-billion-year-old Ventersdorp is responsible for ~6% of the world's gold production.

Gold mineralization will not be consistent on the basin scale or even prospect scale—expect high variability at all levels. The majority of conglomerates I saw were clast and matrix supported with a wide variety of clast types (granite, pyroxenite, basalt, tuff, sandstone, etc.), with boulders up to a meter across. There was also a gold bearing basaltic tuff that makes no geologic sense yet. The matrix was generally mafic sand, and gold always occurred in the matrix—never clasts. These appear to be debris flows (Fig. 7); if so, we should expect very local gold concentration and depletion.



(Fig. 7: Internal structure of debris flow illustrating clast size variability. Where does the gold end up? Source: JSedres, Sepmonline.org)

Novo's biggest geologic hurdle will be sampling this chaotic mess hosting nuggety gold. The company has had some experience with this at Beatons, where drilling, trenching, and bulk sampling produced pretty reliable results. Novo has collected a 700-kilogram bulk sample from Purdy's and will be assaying a nugget size fraction, coarse gold fraction, and the fines. If Novo can document that there is very fine gold in the fine matrix this would be a big positive for the project and offer the possibility of both higher and more predictable grades.

It is clear the gold bearing conglomerates occur over kilometers of strike. We can reasonably assume they persist for kilometers down dip. However, the mineralized horizon's thickness (Z-direction) is unknown. At the Rob's Comet Well prospect it looked like maybe 15 meters of mineralized conglomerate were exposed. At Purdy's, maybe 10 meters, while at the 47K diggings the gold seemed to be coming from a 1-meter unconformable contact. Trenching and drilling set to begin in September and October will go a long way to firming up the mineralized thickness (and Z direction for calculating tonnes).

That's the way we see it,

Joe Mazumdar and Brent Cook

Disclosures

Exploration Insights does not own Novo Resources.

[Note that our trading activity is based on our investment thesis, which can be short (tactical) or long term (strategic), but the timing will not always be perfect due to market volatility and share price liquidity.

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We also want to remind all our subscribers that they have access to the open and closed positions in the EI Portfolio via the website. As soon as we execute a trade, we update the price and date of the open (link [here](#)) and closed (link [here](#)) positions, depending on whether the position was purchased or sold. There can be delays due to the illiquidity of some of the junior mining stocks and the time needed to link a new stock to our website.]

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