



Oil and water: How climate change is threatening our two most precious commodities

As a general rule, the most successful man in life is the man who has the best information

While there is disagreement over its causes – man-made versus natural – the reality of climate change is an incontrovertible fact. The planet is warming, affecting our weather, our oceans, our growing seasons, even our food, as crops fail, causing shortages and price hikes. Storms are becoming more frequent, and more intense, and droughts are lasting longer.



Forest fires are an annual occurrence in Australia, California and British Columbia, and in the United States and the Caribbean, people live in fear of the next hurricane that could literally turn their lives upside down.

Most of us have watched videos of calving glaciers as huge chunks of ice

break off millions-year-old ice sheets and tumble into the sea. They have become emblematic of the highly-politicized cause of climate change, or dare we say, "global warming." Starting with Al Gore's *An Inconvenient Truth*, the global warming alarmists have been on a decades-long crusade against the fossil fuel industry, but few have stopped to think about what are the implications of climate change from an investment point of view.



A warming planet will have a multitude of cascading effects on our resources, and while several examples could be given, we feel the most dramatic will be on our fresh water supplies, and oil operations close to the coasts where higher sea levels could inundate refineries. Rising seas and more frequent storm surges will also have an impact on cities. Some – including New York City – have already started taking pre-emptive measures so that the damage wrought by a natural disaster like Hurricane Sandy is not repeated. Its \$1-billion flood prevention plan includes a \$332 million U-shaped berm that will hug the Lower East Side of Manhattan. What impacts will rising seas have on urban infrastructure that will need to be built to keep the waters at bay?

The worst flooding in years

Hurricanes and tropical storms hitting the United States have been increasing in frequency and degree of devastation. Hurricanes Harvey (which mostly affected Houston) and Katrina were the costliest cyclones on record, with Katrina costing \$161 billion and Harvey \$125 billion in damages mostly from flooding. When Katrina reached landfall it caused a storm surge between 10 and 25 feet, inundating coastal areas across Louisiana and

Mississippi. In New Orleans the levees broke and the city was at one point 80% submerged. The National Guard was called in to help and it is known as the largest displacement of Americans since the Great Depression.

In 2016 Louisiana was slammed again with massive floods. Thirteen people died, 40,000 homes were damaged and there were 30,000 water rescues.



[According to the BBC](#) most of the eastern part of the state received 15 inches of rain in 48 hours; the Amite River rose to 46 feet, beating a previous record set in 1983. Between Katrina in 2005 and the Louisiana floods, other recent natural disasters in the US include the 2014 Washington State mudslide which killed 43; the tornado in Oklahoma in which 24 people died and caused \$2 billion in damages; flooding and tornadoes in Oklahoma and Texas in 2015; and the 2016 East Coast blizzard which killed at least 45. In Puerto Rico, the effects of Hurricane Maria are still being felt, with [nearly half a million residents still without power](#) four months after battering the US island in the Caribbean.

Canadians aren't exempt from flooding either. Between 2000 and 2017 there were 80 flood events, with the worst happening in Calgary in 2013. The cost of damage in the town better known for rodeos than sandbags was an eye-watering \$6 billion (big for Canada). Last summer eight communities in Manitoba declared a state of emergency due to flooding. Earlier this week, overflowing rivers due to heavy rains, snow melt and ice jams forced 5,000 people from their homes in Brantford and had officials announcing a [state of emergency and flood warnings throughout southwestern Ontario](#).

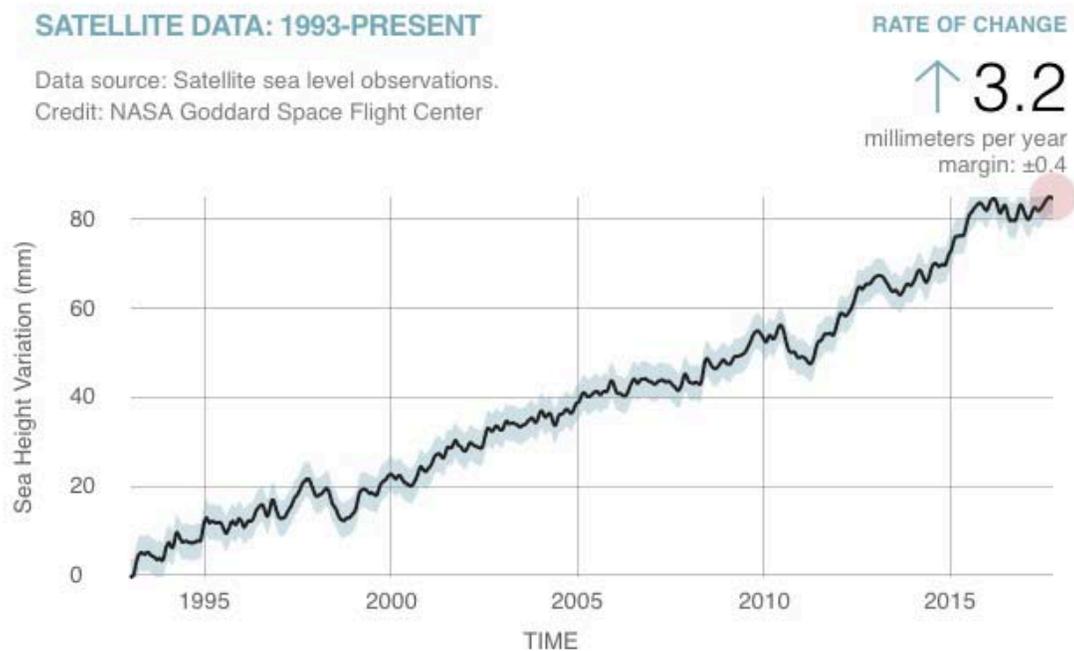
While the floods in North America have been bad and are getting worse, they're eclipsed by what's happening elsewhere. As Texans were worrying about wrecked homes and businesses last summer, heavy flooding in India, Nepal and Bangladesh forced millions from their homes and shut down 18,000 schools. [About 40 million were estimated to have been affected by monsoon rains and 1,200 were killed](#) – putting our own problems with floodwaters in perspective.

The big question is whether all these extreme weather events are isolated incidents or whether they are all connected to a warming planet. [Scientists say they are, even though they can't prove a direct cause and effect](#). They say over the past 30 years there has been a [pattern of increasing average temperatures across the earth](#). Rising temperatures, either due to natural cycles or human-caused emissions trapped in the atmosphere, increase ocean evaporation and the amount of water vapor in the atmosphere. The result is more intense rain and snow storms, and in dry areas, heat waves and droughts. Seventeen of the 18 hottest years on record have occurred since 2001, according to records dating back to 1880; earth's average temperature has risen nearly 2 degrees F since the late 19th century.

The sea is rising

The warming of the earth's surface has caused a widespread retreat of the glaciers at both poles. [According to NASA](#) between 2002 and 2006 Greenland lost 60 cubic miles of ice; in Antarctica it was 36 cubic miles from 2002-05. All of this melting ice has caused sea levels to rise, from between seven and eight inches over the last 117 years, NASA states, with the most rise occurring since 1993. The expansion of ocean water as it warms also causes higher sea levels.

The latest International Panel on Climate Change report predicts sea levels rising between 52 and 98 centimeters by 2100 if nothing is done to stop rising temperatures. An increase of 65 centimeters, or roughly two feet, is expected to cause significant flooding in coastal cities. Satellite images show [sea levels rising 3.2 millimeters a year](#), with the last measurement, taken in October 2017, recording a rise of 84.8mm.



Effects on cities, urban infrastructure

What would happen if the earth warmed by 3 degrees, just one more degree than currently? According to scientists the effects would be calamitous. With eight out of the 10 largest cities near a coast, several millions would be at risk of flooding, shoreline erosion and storm surges. [According to a recent Guardian article](#), the worst-hit cities would be in Asia, including Shanghai, Hong Kong and Osaka. Rio de Janeiro, Miami, The Hague, and Alexandria are also included among the most populated, at-risk cities. Osaka in a 3-degree world would disappear underwater, while in Alexandria, the Egyptian city's beaches would be submerged and 8 million people would be flooded out.

Climate Central ranked the [25 US cities most at risk of coastal flooding](#) and sea level rise. It found that New York is most likely to have problems, with Miami second. Twenty-two of the 25 cities are in Florida. Another reports says the most vulnerable areas are in the mid-Atlantic and south-Atlantic states and the Gulf Coast due to their low-lying topography, high economic value and high storm frequency. Parts of New England are also at risk, while the West Coast with the exception of Puget Sound and San Francisco Bay is less likely to get flooded. According to an [executive summary](#):

The impacts of sea-level rise will vary by location and depend on a range of biophysical characteristics and socioeconomic factors, including human

response. The primary impacts of sea-level rise are physical changes to the environment. These changes, in turn, affect human uses of the coast such as tourism, settlement, shipping, commercial and recreational fishing, agriculture, and wildlife viewing. The most serious physical impacts of gradual sea-level rise on coastal lowlands are (1) inundation and displacement of wetlands and lowlands; (2) coastal erosion; (3) increased vulnerability to coastal storm damage and flooding; and (4) salinization of surface water and groundwater.

If no safeguards are put in place, we can expect \$1 trillion in damages every year in 136 of the world's largest cities. A [2008 study quoted by Scientific American](#) found 2,400 miles of major roadways would be underwater along the Gulf Coast if the ocean rises four feet. Three airports, 246 miles of railways and three quarters of freight facilities would also be submerged.

Thankfully, some cities, states and companies are taking matters into their own hands before the storm waters come. After Hurricane Irma, the largest power company, Florida Power and Light, saw outages to 90% of its customers. But [the grid was restored within two days due to the state's power companies earlier strengthening the grid](#). Hardening measures included concrete power poles, enhancing main lines, and installing “intelligent” devices that detect power problems. Duke Energy spent around \$2.4 billion to strengthen its grid including replacing 802,000 power poles.



Rolling Stone

As mentioned earlier, New York is working on several flood-prevention projects including a U-shaped berm around the Lower East Side – thus shielding 10 miles of coastline with salt-resistant vegetation – a breakwater

on Staten Island, and a flood prevention plan for Southern Nassau County.

In Rotterdam, the Dutch city has for the past 56 years been building up a series of dikes, dams and drains to curb flooding. But the most impressive [points out Mashable](#), are the floodgates. At 72 feet wide and 688 feet long, the floodgates were built in the 1990s, and automatically open and close to allow ships through. Closing the gates prevents flooding and storm surges. Da Nang, Vietnam helped residents to build more flood-resistant homes; in Surat, India, the city developed a flood warning system; and in Semarang, Indonesia, a flood forecasting system predicts when floods will likely occur and where.

Companies that specialize in flood prevention measures like floodgates, early warning systems, and earthworks (for example in the Maldives, islands at risk of sea rise are being gradually raised) could stand to benefit from these flood prevention measures. Other firms that are more into “soft” versus “hard” prevention (ie. building marshes and water-absorbing land forms versus walls that deflect waves into other vulnerable areas) are also likely to be in high demand. [States NBC News](#):

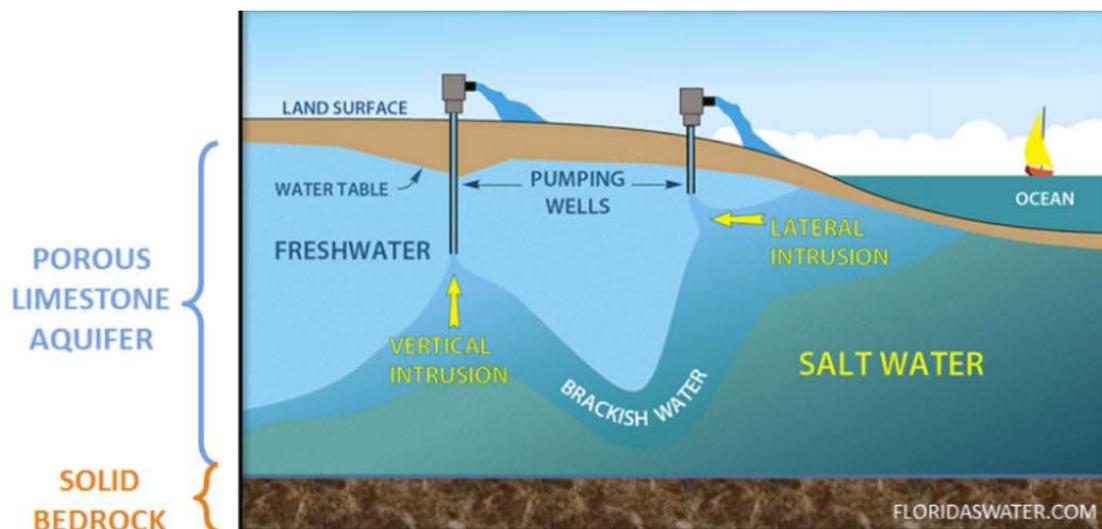
Salt marshes and mangroves trap sediment and organic matter, allowing them to grow in elevation. That affords rising protection against inundation... And according to National Oceanic and Atmospheric Administration, just 15 horizontal feet of marshy terrain can absorb 50 percent of incoming wave energy.

Effects on water

Losing power and being forced to evacuate your home in the event of a flood are usually temporary inconveniences (unless your home is ruined), but an even more troubling effect of rising seas caused by global warming involves our water supplies. A natural disaster usually has cascading effects. Water inundation causes power failure, like during the Japanese earthquake when seawater knocked out power to the nuclear reactors, causing the fuel rods to heat up and release radiation. During Hurricane Sandy around 11 billion gallons of sewage was released into waterways, due to treatment plants either losing power or being flooded. Hurricanes Katrina and Rita in 2005 damaged a number of public services including drinking water supply and sewage treatment plants. During Katrina, thousands of evacuees crammed into the Superdome were not given enough bottled water or food, causing hunger and dehydrations. Toilets broke or ran out of water. The unhygienic, unsafe conditions led to chaos and crime. In the aftermath, legislation was passed to repair storm-damaged sewage treatment and drinking water plants and to provide hurricane assistance to Louisiana, including \$5 billion

for water infrastructure projects. [According to a Congressional report](#), over 1,220 drinking water systems and over 200 wastewater treatment facilities were affected in Louisiana, Mississippi and Alabama. Drinking water and sewage service for over a million customers was severely disrupted in New Orleans.

Another less-known effect of coastal flooding is saltwater inundation. Saltwater inundation is what happens when ocean water infiltrates fresh water aquifers, which can lead to contamination. Imagine drawing a glass of tap water and when you take a sip, the water is salty. Saltwater inundation can occur when groundwater aquifers run dry and the fresh water is replaced by salt water that migrates into the aquifers from the ocean. Primary causes are overpumping of fresh water, a lack of rainwater flowing into aquifers, and storm surges caused by rising sea levels.



Areas where saltwater inundation is a concern include New Jersey, Savannah Georgia, Miami, Tampa Bay, and Los Angeles. In Florida the ocean is already starting to seep into swamp land, which weakens the plants from their peat bedding. "When we start to lose the structure of the plants, essentially this peat, which is otherwise held together by roots, becomes a soupy pond," [explains a University of Florida researcher in an NPR article](#). Millions of people in South Florida get their fresh water from the Biscayne aquifer in the Everglades.

The problem is also [reportedly occurring in China, the Phillipines, and Australia](#). Salt water from the Bay of Bangladesh has penetrated over 100 kilometers inland, due to sea levels rising higher than than elsewhere, thereby [increasing the risk of water contamination and hypertension](#) caused

“The most significant effect of saltwater flooding is not saturation, immersion or resulting organic growth, rather, it is the deposition of salt on vulnerable surfaces.”

by drinking high-salinity water. High river and soil salinity in Bangladesh is also predicted to [reduce rice crop yields, affect the productivity of fisheries, crack road surfaces, and increase poverty.](#)

Climate change is depleting the world's fresh water resources in other ways, too. As the snow cap declines in areas where rivers depend on the freshet, those rivers are shrinking. The best example is the Colorado River, where [warmer weather and lack of precipitation have reduced flows by nearly 20% between 2000 and 2014.](#)

A [study by the University of Arizona](#) predicts that climate change will pull groundwater out of four economically important aquifers at a higher level than they can be recharged. This is because the Southwest region in particular is expected to become drier and hotter. They include the aquifers of California's Central Valley, and the central and southern portions of the High Plains and Arizona's San Pedro aquifers.

Of course, climate change alone can't explain aquifer decline, much of the reason for declining groundwater is due to overuse. For example the Ogallala aquifer, the vast underground reservoir that irrigates fields and towns across eight US states, is gradually depleting. [Scientific American notes](#) that if spread across the US, all 50 states would be covered in 1.5 feet of water. But if it's drained, it will take 6,000 years to refill. The evidence shows that this is happening. The source of the breadbasket of America, responsible for a fifth of American's annual harvest, is being sucked dry at an annual volume equivalent to 18 Colorado Rivers. In a lengthy feature article, National Geographic writes that [the aquifer's decline will be exacerbated by climate change](#), which will make farming days hotter and longer, and cause more frequent droughts:

Already, warmer-than-average evening temperatures in feedlots in southwest Kansas mean that beef cattle drink more water than they did in cooler years. As more farmers return to dryland farming, large farms are likely to swallow smaller family farms, because dry farming, with lower yields, requires more land to be profitable. Irrigation will disappear from most places, so more small towns will fade away. Countless towns across the Plains already teeter on the brink of extinction.

The problem is global. According to two studies led by the University of

California, Irvine, using data from NASA satellites, [a third of the world's aquifers are being rapidly depleted by human consumption](#). The three being diminished fastest are the Arabian aquifer (a water source for 60 million people), the Indus Basin aquifer of northwestern India and Pakistan, and the Murzuk-Djado Basin in northern Africa.

Effects on oil

Despite the shift to renewable energies and all the hype over electric vehicles, the world still uses a lot of oil – [over 35 billion barrels a year according to the IEA](#), which predicts the current 97 million barrels a day will rise to 100 million bpd by 2021.

What is the connection between oil and climate change? The answer is probably easiest to see by playing with the maps [located here](#).

The majority of US refining capacity is clustered along the Gulf Coast and the Northeastern Seaboard, which also happen to be the area's most prone to sea level rise and storm surges either caused or made worse by a warming planet. That's because refineries need to be built close to ports and tankers. A few examples: Valero Energy, the largest US refiner, has nine refineries on US coasts. Of the 11 refineries owned by Phillips 66, three are on coasts. Exxon Mobil has three major refining facilities on the US Gulf Coast, one of which – Baytown, TX – was shut down during Hurricane Rita.

A [2015 report from the US Department of Energy](#) found that "climate change is likely to substantially increase the vulnerability of many energy facilities in the coming decades. As recent hurricane events have demonstrated, this study found that an extensive amount of U.S. energy infrastructure is currently exposed to damage from hurricane storm surge." By extensive, the study means up to 34 refineries, or 8% of current capacity, are currently exposed to storm surge inundation from Category 3 hurricanes. The report says that the Strategic Petroleum Reserve is highly vulnerable due to its proximity to the Gulf of Mexico, and 80 to 100% of US refining capacity is exposed to storm surges.

[The Union of Concerned Scientists urged oil companies to be more transparent about their risks from climate change](#) and said investors should press companies to consider such risks and to take measures to prevent them, including getting refineries to conduct risk assessments, according to a 2015 report.

However [E&E News, which reported on the dangers of flooding to refineries](#) the same year, said none of the refiners mentioned in the Union of Scientists

report discussed the impact to its operations from climate change in filings with the US Securities and Exchange Commission – despite [calls from investors to do so](#).

While many oil companies are staying mum about their plans to address sea rises and other unsavory climate-change-related topics, at least one has taken action. In 2014 the Delaware City Refining Company stated that its shoreline is rapidly disappearing, due to tidal encroachment. The solution? Build a protective ring of buoys “that has the resilience to deal with Sea Level Rise (SLR) for at least 50 years,” [Gawker reported](#). However, in an amusing twist, [a later article stated](#) that the company was trying to get taxpayers, through a federal program, to pay for shoreline protection.

Conclusion

We know that planet earth is warming, and we've shown that the seas are rising, slowly but surely. We don't need or want to get into the reasons why, but the fact is that climate change will have an effect on our water, and likely our oil supplies, in coming years. We've already seen refineries shut down during major hurricanes, which affects supply and hikes the prices of refined oil products like gasoline and heating oil. We've also witnessed the devastating effects that these storms have had on our water infrastructure. Damaged water and sewer pipes took weeks to repair, leaving some of the poorest and most vulnerable citizens lacking basic sanitation and drinking water. Fresh water is also depleting due to saltwater inundation caused partly by rising sea levels, while farther inland, aquifers are being drained due to overuse – a problem that will be exacerbated as temperatures rise.

We don't mean to be alarmist, but a further consequence of climate change could involve money, or more to the point, access to funds. As cities flood, due to storm surges or rising seas, more residents will be driven out of their homes and could even become refugees, as we saw during Hurricane Katrina, when thousands of people were stuck in a crowded stadium without adequate water, food or sanitation.

Calamitous times call for safe havens, and what better safe haven than gold? Gold doesn't require cash machines, it isn't affected by inflation, and it is highly portable and tradeable if cash suddenly becomes scarce.

Like everyone else I'm watching and listening to the evidence of global warming, but I'm not running for the hills. Rather, I'm looking for other investment opportunities that might profit from climate change. And I've got a few on my radar screen. Do you?

If not, maybe you should.

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Ahead of the Herd Updates

As a general rule, the most successful man in life is the man who has the best information

Sernova to employ glucose monitoring system in upcoming clinical trial

Sernova Corp (TSXV:SVA) continues to make progress on its US human clinical trial for Type 1 diabetes, [announcing on Feb. 22](#) that continuous glucose monitoring systems (CGM) will be provided to patients that are enrolled in the trial. CGM will allow Sernova to track the function of the therapeutic cells in order to take key efficacy measurements – including glucose variability and hypoglycemia duration - at multiple time points after the cells are transplanted into the Cell Pouch. The measurements are taken by connecting a glucose sensor, placed inside the body, to a pager-sized monitoring device that stores glucose data over a six-day period.

“We believe continuous glucose monitoring of patients may be an important

and sensitive method to closely track the function of the transplanted therapeutic cells within the Cell Pouch,” said Dr. Philip Toleikis, Sernova’s president and CEO. “We are pleased with our collaborators in this study who have shown the foresight to support Type 1 diabetes patients seeking treatment via next-generation regenerative medicine technologies.”

From Wikipedia regarding SVA’s CGM supplier - Medtronic is among the world’s largest medical equipment development companies. In 2015, at the time of its acquisition of Covidien, its market capitalisation was about \$100 billion. Medtronic operates in more than 140 countries. It employs over 85,000 people and has more than 53,000 patents.

The diabetes trial, approved by the FDA in December, is a major milestone for Sernova, which has been developing the Cell Pouch since 2009. The device is essentially an implanted housing vehicle for therapeutic cells that produce and deliver insulin, as needed. [Read more about the Cell Pouch and the clinical trial here](#)

Echelon Wealth Partners, on February 12th, put out an analyst report formally shifting their Sernova (SVA-V) rating from an idea of interest to a Speculative BUY, with a one-year price target of \$1.00

More good news for Sernova came this week in the form of a note by Mackie Research which put the Ontario-based regenerative medicine company on its watch list. The note advises subscribers to keep SVA on their radar screens “because at some point over the next year it’s likely to accelerate rapidly on a major breakout.” Mackie notes that the stock hit a 10-year high of 51 cents a share on Jan. 3, and sees a major move to the upside once the shares break through resistance in the low-\$0.50s.

Aben kicks off drill program at advanced Chico gold play

Drills will soon start turning at the Chico gold property in Saskatchewan being developed by Aben Resources (TSXV:ABN). In a [press release put out Thursday](#), March 1, Aben said it received an exploration permit from the provincial government and has started camp construction at the 4,656-hectare site. Drilling is expected to begin on March 9, and will initially be four to five holes comprising 1,200 meters. Another 2,000 meters will be added if the holes encounter significant mineralization as expected.

Investors should know that the advanced Chico property is within 40 kilometers of the Seabee/Santoy mine operated by Silver Standard Resources which has produced 1.2 million ounces since 1991.

Chico property highlights include 14.5 grams per tonne over 0.4 meters and 9.6 g/t over 2 meters, five significant intercepts up to 9.6 g/t over 2 meters including 36.3 g/t over 0.5m, and surface sampling that contained 113.5 g/t and 76.5 g/t.

The question Aben aims to answer with the drills is whether these promising results are connected to the IP geophysical survey which shows high chargeability up to about 200 meters below surface (higher chargeability often corresponds to the presence of sulfide minerals such as pyrite, pyrrhotite and chalcopyrite, which are commonly associated with gold mineralization). The discovery horizon in the area is 200-250m. Historical drilling has only been done to 150m.

The drill locations have all been chosen based on geophysical and geochemical anomalies that coincide, and are highly prospective for precious metals mineralization. [For more on Chico and Aben's other area plays in BC and the Yukon, click here.](#)

Advantagewon Oil poised to drill six fresh holes

Recently Advantagewon Oil Corp (CSE:AOC) received the permits needed to drill six new holes at its LaVernia oil play in Texas. Drilling has been held back from an earlier Feb. 27 target due to rain and soft ground preventing the movement of heavy equipment, but the rig is standing by and drilling will commence when ground conditions are right.

Each well is expected to produce 15 barrels of oil a day, for a total of 90 barrels, adding to AOC's existing 45 bopd for a new total of 135 bopd. The company breaks even at 60 barrels a day, so the drill program is a game-changer for AOC because it should make the operation cash-flow positive.

And these wells are not expensive. Because Advantagewon is drilling in shallow sands and using the cheapest method of enhanced oil recovery (EOR), water flooding, the cost per well is expected to be well under \$75,000. This is much cheaper than oil wells drilled in Canada. Also, AOC is being paid in WTI, not Western Canada Select (WCS), which trades at a \$15 per barrel discount, as of Feb. 28. Recoveries per well can be increased by up to 75% using EOR. Being a Canadian company, AOC has to pay its expenses in US dollars but earns revenue in USD (USD\$1=CAD\$1.28), giving it a significant advantage over Canadian oil juniors drilling up north.

If the first set of wells are successful, drilling is expected to carry on into the spring and summer, with the potential to reach 200 to 300 bopd. The

company is well-cashed up – more than enough to carry out its drill program. Advantagewon's current land holdings could provide as many as 100 locations, and with easy permitting and private land owners wanting to receive royalties from drilling, there should be no problem finding new wells to up the barrel count even further. For more on AOC and the resurgent US oil industry, read [Advantagewon with Bread and Butter](#) and [Red Queen versus Bread and Butter](#).

Cypress releases technical report; maiden resource imminent

Cypress Development Corp (TSXV:CYP) has moved another peg on the board as it continues to advance its Clayton Valley Lithium Project in Nevada. The company on [Feb. 21 published a technical report](#) on the project and while it does not yet contain a resource estimate, that is expected soon, likely just after the PDAC conference in Toronto March 4-7. All eyes are on that maiden resource because it is expected to be BIG. Eye-poppingly huge. Cypress has discovered a different type of deposit than the usual brine or hard rock lithium deposits, which must either be mined using drill and blast methods, or pumped into shallow ponds and allowed to evaporate, after which the concentrated lithium carbonate is extracted.

The company is working to establish a resource and economic metallurgical process for what Cypress believes is a large, bulk-tonnage deposit of leachable, non-hectorite claystone. If, as indicated by early results, the claystone is proven to be a significant lithium source rock, then Cypress will have the best of both hard rock lithium and brine - a combination of mining an at-surface leachable deposit, the claystone, that's capable of producing a 'synthetic lithium brine'.

Cypress has tested surface samples of Dean claystone and determined that a synthetic brine can be created that is similar to those produced by Albemarle – its nearby Silver Peak operation is the only producing lithium mine in the US - and Pure Energy brines immediately to the west of the Glory property. In fact a synthetic brine from Dean shows double the lithium value compared to an actual production well from Pure Energy and four times the Albemarle production brine. Recent metallurgical results revealed that the rate of lithium extraction increased to 74% by adding a small amount of sulfuric acid to water to leach the lithium-bearing claystones.

Speaking to head geologist Bob Marvin, Ahead of the Herd learned the deposit starts at the top of an outcrop and descends to around 350 feet below surface. The high-grade portion, with grades between 500 and 1,000 parts per million (ppm) lithium, is now estimated to be nearly 70 meters thick. Recent drilling showed dark green to black, ash-rich "mudstone" starts

at 50m depth. The grade increases at a so-called redox boundary, where material above the boundary is oxidized and below is reduced (oxide and reduced represent two parts of a chemical reaction). The two best holes from the latest Dean property assays showed 107 meters at 1,134 ppm Li and 76 meters of 733 ppm Li. The first of three new holes was completed to a depth of 27m, where oxidized and reduced claystones were encountered throughout. Two more holes are expected to be completed in early March and their results will be included in the resource estimate.

The tonnage numbers of this monster lithium deposit are very impressive, but remember these are your authors numbers, they are NOT 43-101 compliant and are not to be relied on for investment purposes:

3,500 meters length X 2,000 meters width X 70 meters thick X 1.75 specific gravity (density) = 857,500,000t of lithium enriched claystone (approx. 4.5m tonnes of lithium carbonate equivalent - LCE).

Since we have no assays from Glory, these numbers are from what CYP has, so far, drilled on their 100% owned Dean claims only.

A comparison of other lithium deposits is illuminating, to say the least.

Albermarle's Silver Peak Mine is the only operating lithium mine in the US with the capacity to produce 6,000 tonnes of LCE per year. The possibility of Albermarle partnering with, or outright taking over, a junior like CYP has always been intriguing to your author. After all, Silver Peak has been in operation for many decades and its lithium brine grades are rumored to have declined by a significant amount. Add in what might be the beginnings of a global US started trade war and additional lithium in the US might start to look even more attractive.

Neighboring Pure Energy Minerals has a total inferred resource (not reserves) of 218,000 tonnes – which is about 20 times smaller than Cypress' Dean deposit. Lithium X Energy has lithium properties in both the Clayton Valley and Argentina. Its flagship Sal de los Angeles project, which also covers Salar de Diabillos, has an NI 43-101 resource of 1.037Mt indicated and 1.007Mt inferred (again, resources not reserves). This is about half the size of my estimated lithium carbonate equivalent contained in the Dean deposit.

A more fitting comparison is to some of the largest lithium deposits in the world. The Cauchari-Olaroz lithium project in Argentina – a joint venture between SQM, the largest lithium producer in Chile, and Lithium Americas – shows an updated 2017 mineral reserve summary of 1.499 million tonnes of

LCE, to be extracted from the brine operation at a production capacity of 50,000 tonnes per annum, targeted for 2020. The biggest lithium mine in Australia, jointly owned by Albermarle and Talison Lithium (owned by Chinese company Tianqui Lithium) has proven and probable reserves of 2.39Mt of LCE.

Of course, we have to be careful in comparing lithium resources versus reserves, since resources do not have any demonstrated economic viability. But if we take a leap of faith and assume that CYP's estimated 4.3 million tonnes are economically viable to extract, at an average 2017 price of \$13,900 a tonne for battery-grade lithium carbonate... I'll let you do the math. The deposit is world-class. And with lithium prices predicted to rise 16% a year for the next half-decade, its value can only increase. A 43-101 compliant resource report is coming very soon, followed shortly thereafter by metallurgy (lithium recovery) news. I own just one lithium company, Cypress.

Investors piling into Manganese X

Shares of Manganese X Energy (TSXV:MN) are heating up, indicating that this year long Ahead of the Herd hold may have some very interesting news to come. Since Feb. 13 the New Brunswick-based company has been on quite a tear, with the stock price moving from 13 cents a share to 22 cents on Wednesday, just 2 cents away from its 52-week high.

Fresh off a private placement financing that raised \$792,750 (oversubscribed from the initial \$750,000), Manganese X on Tuesday revealed that it has received a [technical study examining the results of 5,188 meters of drilling in 2016-17](#). According to the study which looked at 25 holes from three mineralized areas of the Battery Hill property in New Brunswick, the exploration target potentially has 14 to 31 million tonnes of ore grading between 8 and 11% manganese, and 11-15% iron. The Moody Hill zone hosts higher grades, including 13.4% Mn over 23.6 meters. The mineralization is open for expansion with six targets identified for further drilling.

Manganese X has yet to release a maiden resource for Battery Hill, but historical exploration from 1957 shows 71 million tons at 12% Mn, still open at 700 feet depth with five mineralized zones yet to be explored. An NI 43-101 technical report highlighted in a [corporate presentation](#) shows chip samples with manganese values ranging from 0.72% to 25.9% manganese oxide and iron oxide values between 7.7 and 33.7%.

Manganese X Energy Corp will not be caught up in the US imposed steel

tariffs battle or trade war with the US as they have always maintained they are not interested in the steel market.

From a news release dated the 28th of February;

High extraction levels

The outcome of the extraction testing program spread over two research establishments was extremely positive, demonstrating high manganese extraction levels of up to 96 per cent with variable iron and alkali metal solubility levels, which the company can now leverage in selecting specific ore zones for further metallurgical testing based on higher manganese recovery potential with lower processing costs. Contrary to the common pyrolusite ore, the Battery Hill ore does not require a prereduction step.

High-purity manganese sulphate

The 2017 metallurgical work led to a comprehensive understanding of the technical steps to achieving a high-purity manganese sulphate, which is a precursor to the production of manganese compounds for use in the burgeoning lithium ion battery, as well as the pharmaceutical and other industries.

Future work

Manganese X Energy is currently in an advanced stage of launching a metallurgical program to further develop processing alternatives to upgrade the ores. The company is also creating a dedicated process technology division to develop the most cost-competitive purification techniques for production of market-leading high-purity manganese sulphate.

And just released on Friday was this potential positive cash flow tidbit;

MANGANESE X NEGOTIATING SIGNIFICANT OIL AND GAS TRANSACTION

Manganese X Energy Corp. is currently in negotiations to purchase an interest in a privately owned Canadian oil and gas company (Privateco). Privateco has a contract with Schlumberger Ltd., an oil and gas services company (SLB on the New York Stock Exchange with a market cap of \$92.2-billion (U.S.)), to utilize a newly developed technology that increases oil and gas yields. Privateco will utilize this with its existing oil and gas properties, as well as any future oil and gas acquisitions, which have been approved by

Schlumberger. Schlumberger will finance this implementation and receive 30 per cent of the profits from the increased outputs.

The investment in Privateco is expected to generate dividends to Manganese X, which will finance the Battery Hill project and reduce further dilution to Manganese X shareholders. Further details will be released at the appropriate time.

From Wikipedia regarding Schlumberger; "Schlumberger Limited is the world's largest oilfield services company. Schlumberger employs approximately 100,000 people representing more than 140 nationalities working in more than 85 countries."

You have to like that.

Conclusion

Are our junior resource companies whose place in the resource food chain is to explore for and find, metals, oil and minerals that enable your modern lifestyle on your radar screen? I can guarantee you they are on mine.

If they are not on yours, maybe they should be?

Richard (Rick) Mills

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Richard Mills owns shares in Sernova Corp (TSX.V:SVA), Aben Resources (TSX.V:ABN), Advantagewon Oil Corp (CSE:AOC), Cypress Development Corp (TSX.V:CYP) and Manganese X Energy (TSX.V:MN)