

WWR / Nasdaq

**SPECULATIVE  
BUY**

Unchanged

**\$1.50**

Unchanged

**CAPITALIZATION**

Shares Outstanding (2/15/19)	74.4 M
Recent Price (2/25/19)	\$0.14

Market Capitalization	\$10.4 M
+ Debt	0.0 M
- Cash	1.6 M
Enterprise Value	\$ 8.8 M

Book Value	\$20.8 M
Working Capital	\$ 1.0 M
Dividend	Nil

Balance sheet figures as of 12/31/18

**MARKET DATA**

Bid-Ask Spread, % Price	1.4%
52 Week High/Low	\$0.13 - \$0.86

Shares Outstanding	74.4 M
Inside Ownership	<1%
Institutional Ownership	15.0%
Estimated Flotation	73.7 M

Average Daily Volume	670 K
Short Interest, % of Float	0.6%
Beta	0.99

Source: Bloomberg LP

**INVESTMENT RETURNS**

	WWR	Sector*
Return on Equity	Neg	18.8%
Return on Assets	Neg	7.5%
Return on Capital	Neg	10.0%

Source: Crystal Equity Research, CSI Markets

**FINANCIAL PROFILE**

	FY17	FY18
Sales	\$ 0.0 M	\$ 0.0 M
EBITDA	(\$12.2) M	(\$11.2) M
EPS	(\$0.78)	(\$0.77)

Source: Company Reports

**HIGHLIGHTS**

- **Quarter report.** Report of fourth quarter 2018 financial results suggests management has a firm grip on spending. Frugality was also in evidence for the full year as cash operating expenses totaled \$11.2 million in 2018.
- **Cash resources.** Westwater has an estimated \$1.0 million in cash at its disposal at the end of February 2019. The Company also has at its disposal \$23.9 million in unused capacity in an 'at-the-market' common stock sales agreement with a leading investment bank.
- **Graphite pilot plant.** Plans to build a pilot plant for graphite refinement are on schedule for completion by year-end 2019, with first sales of *Purified Micronized Graphite (PMG)* in 2020.
- **Vanadium asset.** Early test results show there are concentrations of up to 0.4% vanadium pentoxide in areas adjacent to the Coosa graphite resource. With additional assay work, data on incremental profits could be available before year-end 2019.
- **Valuation.** Review of an early economic assessment of Coosa County graphite resource suggests most assumptions still apply and thus the PEA supports our view of deep undervaluation at the current WWR price.

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INDUSTRY: INDUSTRIAL, ENERGY MATERIALS

WWR: NASDAQ

## RECENT DEVELOPMENTS

Westwater Resources continues to move forward with each of its three energy mineral assets - uranium, lithium and graphite. Tests are underway to add vanadium as a fourth metal to the mix. When the Company eventually begins to mine graphite at the Company's Coosa County project in Alabama in 2026 as planned, it may be possible to exploit the vanadium deposits as a by-product, thereby increasing potential revenue and improving profit margins.

Development of battery-grade graphite has been made top priority. Plans for a pilot plant to produce *Purified Micronized Graphite (PMG)* for the battery market are well underway and appear to be on schedule for completion by the end of 2019. Initial production of PMG is planned in 2020, with volume production to follow in 2021 to deliver the Company's first revenue in several years. Initial production will be accomplished using outsourced graphite materials. At least two potential customers are testing PMG materials in their battery products and another two dozen possible customers have signed non-disclosure agreements to receive samples of Westwater's battery-grade graphite materials.

## RECOMMENDATION

We continue to rate WWR share at Speculative Buy with a \$1.50 price target. Our view is informed by a mix of factors that favor a value greater than the current stock price. Opportunity in the energy minerals market remains robust with sales values totaling over \$1.0 billion. Demand conditions and pricing in each of the markets for the Company's mineral products remain favorable. Despite constrained capital resources, management has moved the ball forward for each of its mineral assets, adding value and moving closer to commercial stage for its graphite asset in particular.

Granted in June 2018, the Company was set back by the loss of uranium mining licenses in Turkey. Legal efforts are well underway to recover losses in Turkey, but the uncertainty of the outcome may continue to weigh on share value for some months to come.

Westwater is also facing a challenge to continued listing on the Nasdaq Capital Market. In April 2019, we expect shareholders to authorize a reverse split to remedy the listing issue and keep the Company in good standing with stock sale agreement that allows the Company to raise capital incrementally at current market prices. While not welcome, we believe the action could preserve the Company's access to capital at more favorable valuation that would be the case if WWR were traded via alternative market venues such as the Over The Counter quotation service as an example.

## VALUATION

Price/Sales	Neg
Price/Cash Flow	Neg
Price/EPS	Neg
Price/Book Value	0.50 X
Consensus EPS 2019	na
Forward PE	na

## OPERATING PROJECTIONS

	2017A	2018A	2019E	2020E	2021E
Sales	\$ 0.0	\$0.0	\$ 0.0	\$ 0.9	\$ 16.9
Operating (Loss)	(\$ 24.8)	(\$36.0)	(\$12.1)	(\$ 14.7)	(\$ 13.7)
Net Inc (Loss)	(\$ 19.0)	(\$35.7)	(\$ 12.1)	(\$14.7)	(\$ 13.7)
CFO (U)	(\$ 11.6)	(\$11.7)	(\$ 8.9)	(\$10.6)	(\$12.4)
EPS (LPS)	(\$0.77)	(\$0.77)	(\$0.16)	(\$0.15)	(\$0.13)

Dollars in millions except per share earnings

Per share figures estimated 12/31/18

Company Reports and Crystal Equity Research Estimates

## FOURTH QUARTER AND YEAR-END 2018 RESULTS

Report of fourth quarter and year-end 2018 financial results suggests Westwater Resources management has a firm grip on spending. Even with the added burden of legal actions against a government mining authority and expenses for testing of a fourth possible resource in Westwater's mineral portfolio, the Company kept cash operating expenses to \$2.5 million in the final three months of 2018. This compares to \$2.8 million in the previous quarter and \$3.2 million in the same quarter in the previous year.

The majority of operating expenses supported general and administrative activities. The Company's activities focused on developing the natural flake graphite asset in Alabama, initial exploration of lithium assets in Nevada and Utah, and reclamation and maintenance of uranium assets in Texas. Additionally, in the second half of the year, management incurred legal expenses related to an arbitration action against the Republic of Turkey's mining authority.

Spending discipline was in evidence for the long-term as cash operating expenses totaled \$11.2 million in the full year 2018. This compares to \$3.2 million in cash spending in the previous year. General and administrative expenses totaled \$7.4 million compared to \$6.6 million in the year-ago period. Cash usage by operations, which considers additional non-cash charges and expenses as well as the use of working capital accounts as cash resources, was \$11.6 million for the full year 2018.

Table I: Fourth Quarter and Year-end 2018 Summary		
	Quarter Ending 12/31/18	Year Ending 12/31/18
Operating Expenses as Reported	\$8,885	\$36,049
Less Selected Non-Cash Claims and Charges		
Accretion of Asset Retirement Obligations	592	993
Impairment of Assets	5,744	23,712
Depreciation and Amortization	<u>22</u>	<u>116</u>
Adjusted Operating Expenses	\$2,527	\$11,228
<hr/>		
Net Loss from Continuing Operations as Reported	(\$8,671)	(\$35,684)
Plus: Depreciation and Amortization	22	116
Plus: Impairment of Assets	\$5,744	23,712
Plus: Accretion of Asset Retirement Obligations	<u>592</u>	<u>993</u>
Adjusted Net Loss from Continuing Operations	(\$2,335)	(\$10,863)
<i>Dollars in Thousands</i>		
<i>Source: Company Reports and Crystal Equity Research estimates</i>		

## YEAR-END 2018 BALANCE SHEET

### Property and Equipment

Total assets totaled \$30.0 million at the end of 2018, including \$20.6 million for property, plant and equipment. Fixed assets reflected a write-down of uranium mining assets in Turkey and the U.S. following revocation of mining licenses by the mining authority of The Republic of Turkey and the evaluation of uranium resource assets in the U.S. That action in June 2018, triggered a charge of \$18.0 million for impairment of the Turkey mining license assets in the second quarter 2018. In the most recently reported quarter ending December 2018, the Company recorded an additional impairment charge of \$5.7 million related to processing equipment currently located at the Rosita and other uranium projects in Texas.

No longer in use in the U.S. uranium mining program, the Rosita equipment was to be transferred to Turkey as those projects were brought to commercial operation. Since those plans have been extinguished subsequent to the Turkey license revocation and with no immediate plans to resume operations in Texas, accounting standards now require the classification of the Rosita equipment assets as impaired. The impairment charge also related to resource mining and processing assets located at the Kingsville Dome and Vasquez projects in Texas.

The processing assets remain in place at the Rosita facility and could be sold or deployed for future use. Nonetheless, the Company can include the impairment of the asset in its claims against the Turkish mining authority, the General Directorate of Mining Affairs in the Turkish Ministry of Energy and Natural Resources.

### Cash Resources

Westwater also reported \$1.6 million in cash assets at the end of December 2018. We note that subsequent to the end of the fiscal year, the Company received interest and principal payments from Laramide Resources as payment for assets sold to Laramide in 2017, including \$795,000 in cash and 2.5 million shares of Laramide common stock. We estimate that at the recent pace of cash usage to support operating activities, the Company had approximately \$1.0 million in cash at its disposal at the time of this report.

The Company has at its disposal \$23.9 million in unused capacity in 'at-the-market' equity sales agreement through Cantor Fitzgerald & Co., which Westwater calls the ATM agreement. Additionally, the Company expects to regain access to certain cash assets currently held as restricted in support uranium project contingencies. Westwater may also sell the Laramide shares, as it did with a portion of Laramide's in-kind loan payment received in 2018. We note the Company may well prevail in the dispute with Turkey over the confiscated uranium mining licenses. However, any compensation Turkey could ultimately pay is uncertain and the timing is not likely to be received in the near-term.

### Going Concern Note

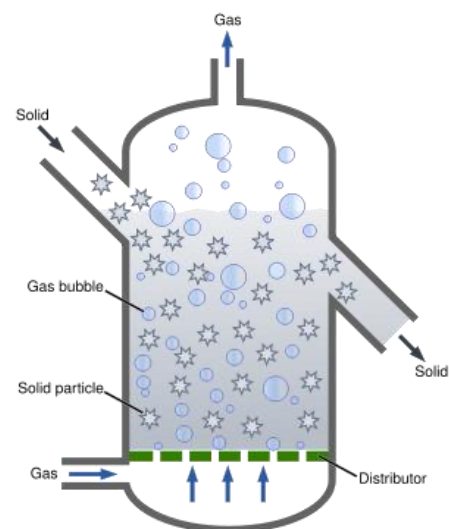
With limited financial resources and capital investment requirements increasing to achieve Westwater's strategic goals, the Company's auditors attached a going concern caution to the 2018 audit. To be a going concern a company must be able to continue operating long enough to carry out its commitments, obligations and objectives. If there is some uncertainty about whether a company has sufficient resources to execute on its strategic plans, auditors may include a 'going concern' caution in the annual audit. A going concern warning suggests that a company may have to liquidate some assets to move ahead. With what is left of Westwater's uranium assets, new lithium bearing claims, well proven graphite resource assets, and now the prospect of valuable vanadium resources, Westwater does have significant assets at its disposal.

## MINERAL MARKETS

### Graphite

Westwater Resources is making graphite its highest priority. During the conference call to discuss fourth quarter results, management indicated that plans to build a pilot plant for graphite refinement are on schedule for completion by year-end 2019. In 2020, the Company plans to begin production battery grade graphite using natural flake graphite sourced from third parties. The first planned product is *Purified Micronized Graphite (PMG)* for use in enhancing performance in certain battery types. At least two potential customers are testing *PMG* for use in their products.

We also note that the Company has disclosed more details on revised plans for its graphite refinement process. The Company plans to upgrade and refine graphite from the Coosa graphite project in Alabama with ore extraction beginning in 2026. Westwater has chosen an 'electro-thermal fluidized bed furnace' favored by established metals processors. The main advantage of treating carbon materials with this type of process is that these furnaces allow precise control and continuous processing. Additionally, the process ensures uniformity of properties and high chemical purity of the resulting refined graphite, two characteristics highly valued in battery-grade graphite. These furnaces can also be economically operated on recycled energy sources even though high operating temperature requires significant energy use.



Electro-thermal Fluidized Bed Furnace Diagram



Alabama Power Coosa River Hydroelectric Dam

It might be possible for Westwater to negotiate long-term power supply arrangements to power its processing furnaces. Management will have their work cut out for them. According to the U.S. Energy Information Administration, average electricity rates in Alabama are near \$0.1265 per kilowatt hour, making the state the second highest among the fifty U.S. states. Indeed, Alabama residents spend more on electricity than any other state except South Carolina. In the area of the Company's planned Coosa County

graphite project, Alabama Power is the primary electricity source. Alabama Power's hydroelectric generating plants are located along several lakes on the Tallapoosa, Coosa and Black Warrior rivers.

Demand conditions remain favorable for Westwater's planned graphite products, particularly for coated spherical graphite used in lithium-ion batteries. An essential metal used in the current design for anodes in lithium-ion batteries, demand for graphite is expected to remain robust over the next decade. New supply has come into the graphite market over the last couple of years, including Syrah Resources (SYR: ASX) and Advanced Metallurgical Group NV (AMG: AS) in Mozambique, Bass Metals (BSM: ASX) in Madagascar, and Imerys SA (NK: PA) in Namibia. Supply from these projects may have contributed to softer prices in recent months. Nonetheless, through the beginning of 2019, prices for various graphite grades have remained economic for most producers.

Benchmark Mineral Intelligence estimates that total natural graphite production is near 1.2 million metric tons per year, including about 300,000 tons of battery-grade graphite. Ultimately, at least 950,000 metric tons of battery battery-grade will be needed to support the planned roll out of new electric vehicles. The estimate includes consideration of alternative materials for anodes such as silicon and the advent of solid state battery designs, most of which will likely be used initially in limited edition and high-end models. New technologies are expected to gain traction, but only partially eliminate the need for graphite over the next decade. Benchmark analysts suggest that at least 2.5 million metric tons of new natural graphite must be produced annually to meet the growing demand.

### Vanadium

The decision to develop vanadium deposits at the Coosa County graphite project has added a fourth metal to Westwater Resources energy mineral portfolio. As a by-product of graphite production, development of the Coosa County vanadium resource will follow the timeline for the graphite mine, which is presently targeted to begin operation in 2026. Historically, multi-ore operations deliver higher production efficiency and improved profit margins.



Roscoelite Mineral  
Specimen Typical of Coosa  
County Graphite Project

Westwater gathered over 2,000 core samples and contracted for initial assay work by a third party in December 2018. Test results showed that in areas adjacent to the Coosa project graphite resource there are concentrations of up to 0.4% vanadium pentoxide. This is equivalent to 8 pounds vanadium per short ton. In areas within the graphite resource the tests found values up to 0.26% vanadium pentoxide.

The initial test results were of sufficient quality to warrant additional assay work that could be completed as early as the end of March 2019. The Company will then evaluate processing options with a view to economically recovering the vanadium as a by-product of the planned graphite exploitation. Management expects to have data on incremental revenue, capital requirements, operating costs, and potential incremental earnings well before the end of 2019.

Westwater is not the only company to initiate new vanadium supply projects. One of the Company's competitors in the uranium market, Energy Fuels (UUUU: NYSE) is considering the resumption of vanadium production at its White Mesa uranium project. In late 2018, a scoping study was recently completed for Mustang Resources (MUS: ASX) for its graphite and vanadium assets at the Caula project in Mozambique. Syrah Resources Ltd. (SYR: ASX) has identified potential vanadium deposits at its Balama graphite project in Mozambique.

Despite the appearance of competing projects, Westwater is coming to the vanadium market under highly favorable conditions for new suppliers. Vanadium pentoxide is the most common form of the mineral and is preferred for a wide variety of industrial processes. While the majority of vanadium supply is used in steel production, demand for the metal for vanadium flow batteries is building. Demand has increased at a faster pace than supply, putting pressure on selling prices. Consequently, the vanadium pentoxide price has been on a steady upward move over the last three years, reaching the current price near US\$17.65 per pound. Even as new projects have started up, some sources of supply have been shuttered in the last couple of years, including the Mapochs mine owned by Evraz Highveld. Additionally, China output that has been curtailed following environmental inspections. It is notable that China's domestic demand is growing as new regulations have gone into effect requiring the use of vanadium for steel alloy used in construction rebar.

### Uranium

Westwater remains on hold with its uranium mining assets in Texas and New Mexico. Uranium market prices have yet to fully recover from the correction that followed the Fukushima accident in 2011 and the subsequent closure of a number of nuclear power plants. The price declined to a recent low near US\$13.00 per pound in 2016, rising to US\$29.10 per pound at the end of December 2018. Long-term contracts prices are near US\$31.50 per pound. Price increases have ensued as the power plants in operation have worked through existing uranium stockpiles.



The use of secondary supply sources, in particular underfeeding, has been a key factor in keeping the spot and contract prices for uranium at historic low levels. The persistence of low contract prices has driven several producers to mothball production, including Westwater.

According to the World Nuclear Association at the present time there are 468 power plants in operation, which collectively require about 172 million pounds of uranium each year. There are another 55 nuclear power reactors under construction around the world. Supply requirements are expected to increase to approximately 190 million pounds in 2019. There appears to be a building consensus among uranium mining companies and other industry watchers that the uranium market appears set up for a supply-demand imbalance by the year 2021.

Current global uranium mine production is near 140 million pounds, implying a 50 million pound deficit. Mines provide the majority of uranium supplies, but stockpiles owned by utilities and governments are secondary sources. Dismantled military warheads, recycle uranium, re-enrichment of depleted uranium, and underfeeding by enrichment plants are common alternatives to new supply. Indeed, since the Fukushima accident underfeeding at enrichment plants and the resale of the surplus has been an important source of supply for nuclear power plants.



Georgia Power Nuclear Plant

The costs of incremental production or marginal costs are key to uranium producer decisions to ramp up or curtail production. Marginal costs to extract uranium vary widely from over \$200 per pound in seawater extraction processes to \$50 per pound in some Africa mining operations to \$25 per pound in areas of Eastern Europe. Westwater has cited marginal costs in a range of \$40 to \$45 per pound at its Texas operations. UxConsulting Company (UxC), an industry research firm, estimates that there is sufficient supply from sources with marginal costs below US\$40 per pound to meet expected demand through the end of 2020. After that new demand pressures may entice existing plants back into production or trigger new development where costs exceed US\$40 per pound.

There had been a lengthy dry period for financings in the uranium market. However, recent successful offerings reveal investors are still listening to the value proposition in uranium. In December 2018, Mega Uranium (MGA: TSX) raised CN\$1.8 million in a private placement. Mega is developing uranium properties in Australia and Canada. In early January 2019, Appia Energy Corporation (API: CSE) closed a private place of common stock to raised CN\$1.4 million to supports planned development of the Loranger uranium property in Saskatchewan.

Other developers are meeting industry challenges with strategic actions. In July 2018, shareholders of URZ Energy Corporation (URZ: TSX) and Azarga Uranium (AZZ: TSE) voted to approve a merger plan for the two companies. NX Uranium (NXUR: OTC/QB) has reportedly thrown in the towel on uranium altogether and made a switch in management in order to pursue cannabis production.



## Lithium

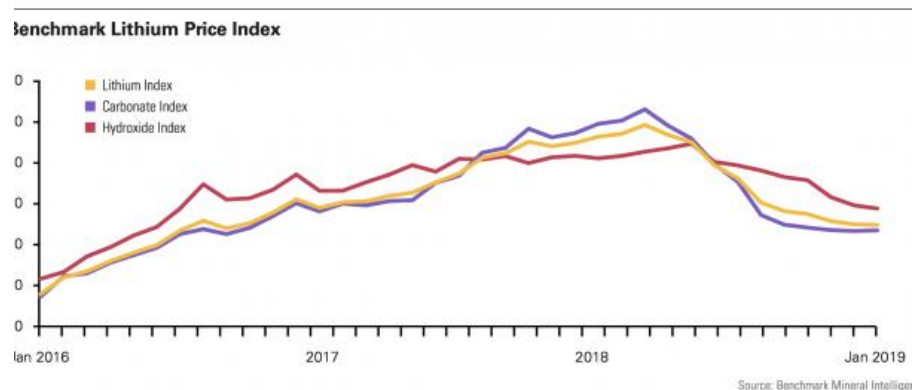
Westwater Resources has acquired a clutch of lithium assets in Nevada and Utah over the last couple of years. The Company continues exploratory testing and assay work to determine the character of lithium deposits. We expect to see periodic announcements relating to assay work, and other engineering activity that provides guidance on the best development alternatives.

The lithium discussion throughout the year 2018, was dominated by fears that burgeoning supply from new lithium development projects in South America would crash selling prices. However, by the end of 2018 prices appear to have stabilized after only a brief move downward. It appears that expectations for new supply were wildly out of step with the realities of bringing new lithium projects into production.

As we noted in our report dated November 12, 2018, delivered supply can be dramatically lower than planned development. We provided the example of how a previous surge in lithium development plans in 2012 made it appear that the industry was poised to more than double in volume. However, by 2016 only about 25% of those planned projects had reached the market. Historically, it has taken about six to seven years to bring a lithium project into production, although new technologies in the lithium brine segment may shorten that timeline. In our view, the predictions of extended oversupply and long-term depressed pricing conditions are well overplayed and failed to take into consideration the realities of project development.

We also note that hard rock sources could be as important as South American brine sources in the current supply story. Developers in South America, including SQM and Albemarle, have experienced multiple headwinds in their respective quests to bring new brine projects into production. Accusations of license violation, allegations of tax underpayment, and regulatory challenges have delayed work. Producers took advantage of missteps in the South America brine projects to send off shipments of concentrate from spodumene operations in Australia to converters and processors in China. In a telling move in October 2018, Albemarle simultaneously announced plans to invest in additional hard rock mining operations in Australia and to curtail investment in Chile by 2021.

According to Benchmark Mineral Resources lithium prices have stabilized. For example, the midpoint price of battery grade lithium carbonate ended 2018 US\$11,500 per metric ton. However, demand pressure from lithium-ion battery producers in particular is expected to rebuild in 2020 and beyond.



## REVISED FINANCIAL MODEL

Our earnings model has been updated to reflect fourth quarter and year-end 2018 financial results. Additionally, we made minor adjustments in cost and expenses estimates. The model continues to reflect the first revenue from battery-grade graphite in 2020 and higher volumes in 2021. It is assumed that the Company remains listed on the Nasdaq Capital Market tier for companies with low market capitalization and thus continues to rely on the ATM agreement to sell common stock to raise needed capital.

	Year 2018A	Year 2019E	Year 2020E	Year 2021E
Sales	-0-	-0-	\$0.9 M	\$16.9 M
Costs and Expenses	\$36.0 M	\$12.1 M	\$15.2 M	\$16.2 M
Operating Loss	(\$36.0) M	(\$12.1) M	(\$14.7) M	(\$13.7) M
Net Loss	(\$36.1) M	(\$12.1) M	(\$14.7) M	(\$13.7) M
Loss per Share	(\$0.77)	(\$0.16)	(\$0.15)	(\$0.13)
Shares Outstanding				
Source: Crystal Equity Research estimates				

## OUTLOOK

Westwater's stock price has remained under pressure despite news that work is on schedule to develop the Company's recently acquired graphite assets that could lead to initial revenue streams before the end of 2020. Even the confirmation of exploitable vanadium deposits at the Coosa County graphite project in Alabama has failed to gain favor.

We believe trading in the stock is overshadowed by a couple of significant issues. First, the loss of uranium mining licenses in Turkey. Even with the prospect of resolution through Westwater's request for arbitration there is still considerable uncertainty as to the amount and timing of compensation by Turkey's mining authority. Second, in March 2018, the Company received notice from the Nasdaq Market that its shares do not meet the listing requirement of a stock price over \$1.00 per share. A delisting action could limit trading in the stock and frustrate the Company's ATM agreement with Cantor Fitzgerald. At the time of this report, only a few days remain on a six-month extension offered by Nasdaq for Westwater to regain the \$1.00 price level. The Company may request another extension, but must demonstrate a viable plan to bring the shares into compliance.

## Stock Price Remedies

One obvious remedy to low share price is to win new interest in the Company's plan to develop an energy minerals portfolio and encourage higher bids for the stock price. Unfortunately, the loss of the uranium mining licenses in June 2018, has worked directly against that objective. A resolution of the discrepancy before an arbitration panel could move forward yet in 2019.

A fall back option is to execute a reverse split of the shares, thereby increasing the price above the \$1.00 goal through the reduction in the number of shares outstanding. Indeed, the Company has already placed a proposal before shareholders to authorize a reverse split. The shareholder vote on the reverse split proposal is scheduled for April 2, 2019.



The plan may very well meet Nasdaq's definition of a viable plan, but investors may still fret over the prospect of another reverse split. It may not be enough that the Nasdaq listing ensures access to the capital market at current market prices through the ATM facility set up with the investment banking firm Cantor Fitzgerald. Unfortunately, alternatives may involve as much or more dilution as the ATM facility. For example, one other option is quotation on the Over the Counter service and private placements of common stock with retail investors. Such offering frequently required significant discount to the current market price. Even at market prices, such offerings are often accompanied by the issuance of warrants to enhance future returns.

## Stock Price Catalysts

Shareholders may need a spoonful of sugar to get the reverse split 'medicine' to go down. The sweetener may come in the form of announcements throughout the year on results from additional tests on vanadium deposits at the Coosa graphite project in Alabama. A scoping study is already underway and management expects to have enough information before year-end 2019 to determine the incremental revenue and costs of exploiting vanadium deposits along with graphite. We believe that it is more likely than not that the realization of a second revenue source would add economic value to the Coosa project.

In our view, announcements of test results should provide greater certainty to vanadium as Westwater's fourth mineral asset. Furthermore, revision of the Coosa project income and costs to include vanadium should also be a catalyst for higher valuation. Even if minority investors do not recognize the value creation underway, we expect the progress in testing and evaluating the vanadium opportunity could make the project more interesting to institutional sources of debt and equity financing for the Coosa mine project.

## VALUATION

In our view, Westwater Resources shares remain deeply undervalued. The shares are priced at one half of the Company's book value (assets net of liabilities), suggesting that in the event of asset liquidation shareholders expect to receive only fifty cents on the dollar. The view seems to imply that the Company cannot succeed in its plan to exploit its mineral resource assets and that there is limited market value for those assets.

Table III: Valuation Metrics		
	Reported 12/31/18	Price Multiple @ \$0.14 / sh
Total Assets	\$30.0 M	0.35 X
Property, Plant & Equipment, net	\$20.6 M	0.50 X
Book Value	\$20.8 M	0.50 X
Shares outstanding as of 2/15/19		74.4 M
<i>Source: Crystal Equity Research estimates</i>		

### Valuation Scenario

Finance theory holds that a company is worth the present value of the future cash flows it can deliver to shareholders. A valuation analysis for Westwater Resources can be simplified by excluding from the discussion cash flows from the lithium and uranium assets. Lithium assets are at least five to seven years from commercial stage. Likewise, it could be two to three years before the uranium assets can be returned to full operation. The analysis can be made even more straightforward if the vanadium opportunity is left out. The resource has not been definitively quantified and critical decisions on processing methods have not been made. This leaves the graphite asset as the single provider of value in our stripped down valuation exercise.

### Revisit of Preliminary Economic Assessment

Fortunately, considerable work has been done to evaluate the Coosa County graphite project. A preliminary economic assessment (PEA) was completed in 2015 provides a good starting point to analyze the potential of the 78.4 million indicated tons of graphite ore at that site. Assay results suggested a yield of 1.88 tons of graphitic content that Westwater can process into battery-grade graphite materials. The PEA assumed a 27 year mine life based a processing capacity of 1,650 tons of ore per day.

Is the 2015 PEA report still valid? Importantly, the graphite remains locked in the rocks just below the topsoil and is keeping its carbon character without change. Thus we can continue to

rely on the number of tons and mine life assumptions in the PEA. True enough additional work could find slightly higher or lower figures, but the existence and quantity of graphite in the area has been documented several times since the original geological work and initial mining operations in the mid 1900's. The required mining and processing design is also still valid as well. Management may find new efficiencies or choose more expensive equipment, but the basic mining process is likely unchanged from the preliminary design.

What could have changed in the four years since the PEA was completed in 2015 are capital and operating costs as well as graphite selling prices. Investors are well advised to review revenue and cost assumptions included in the original PEA. For example, the PEA itself provided clues on the sensitivity of the analysis to changes in prices, suggesting that a 20% decrease in assumed selling prices could reduce value by \$94 million from the base case conclusion.

Ranges of selling prices for the Company's planned graphite materials products were used with midpoints of \$8,165 per ton for *Coated Spherical Purified Graphite (CSPG)* and \$1,815 per ton for *Purified Micronized Graphite (PMG)*. Throughout 2018, we found selling prices held firm as graphite remained in tight supply, but today prices are closer to the low end of the range used in the PEA. As of early 2018, coated spherical graphite appears to be selling near \$7,000 per ton, which compares to \$7,257 used in the low case of the PEA. Upgraded graphite like the Company's *PMG* is selling near \$900 per ton. This also compares well to the \$907 assumption for *PMG* selling price used in the PEA's low case. The comparison suggests it is prudent to focus on the low price case featured in the PEA.

Inflation can impact capital operating costs. The U.S. has experienced 2% average annual inflation over the last four years and we applied this rate to the operating costs detailed in the PEA. It appears infrastructure project cost indices on average have increased at a pace greater than average inflation. Commercial construction has averaged 4% for the last five years, due in part to steel price increases in higher labor costs. Accordingly, we increase capital costs by 4% per year for the last four years to the PEA budget of \$44.4 million for initial capital costs and a total of \$127.6 million over the life of the mine.

In the interests of conservatism we focused on the highest and thus the most conservative of the discount rate used in the PEA. Using the low-price case detailed in the PEA, adjusting for higher capital and operating costs, and using the 12% discount rate, the value today of the potential cash flows from the Coosa graphite project could be as much as \$130 million after taxes.

This is dramatically higher than the current market capitalization of Westwater Resource near \$10.4 million, supporting our view that the stock is oversold. Even considering current, liabilities and the maintenance and remediation liabilities for the Company's various mineral assets, the fundamental value of the graphite resource asset far exceeds current market value.

**ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST.**

Table IV: Valuation Scenario Based on Preliminary Economic Assessment

	Unit	Original PEA			Adjusted PEA		
		Low Case	Base Case	High Case	Low Case	Base Case	High Case
<b>Metal Prices</b>	US\$/Ton						
CSPG		7,257	8,165	9,072	<b>7,257</b>	8,165	9,072
PMG		907	1,814	27,522	<b>907</b>	1,814	27,522
<b>Operating Costs</b>	US\$M						
Open Pit Mining		113.9	113.9	113.9	<b>123.3</b>	123.3	123.3
Processing		136.0	136.0	136.0	<b>147.2</b>	147.2	147.2
G&A		31.8	31.8	31.8	<b>34.4</b>	34.4	34.4
Purification Plant and Trucking		251.1	251.1	251.1	<b>271.8</b>	271.8	271.8
Subtotal Operating Costs		532.8	532.8	532.8	<b>576.7</b>	576.7	576.7
<b>Capital Costs</b>	US\$M						
Open Pit Mining		8.3	8.3	8.3	<b>10.1</b>	10.1	10.1
Processing Plant		33.6	33.6	33.6	<b>40.8</b>	40.8	40.8
Purification Plant		32.5	32.5	32.5	<b>39.5</b>	39.5	39.5
Infrastructure		8.9	8.9	8.9	<b>10.9</b>	10.9	10.9
Environmental Costs		1.3	1.3	1.3	<b>1.6</b>	1.6	1.6
Indirect and Contingency		42.9	42.9	42.9	<b>52.2</b>	52.2	52.2
Subtotal Capital Costs		127.6	127.6	127.6	<b>155.1</b>	155.1	155.1
<b>Cash Inflows - Outflows</b>							
Total Revenue	US\$ M	2,141.9	2,233.5	2,827.3	<b>2,141.9</b>	2,233.5	2,827.3
Royalties (2.5%)		38.2	45.1	51.9	<b>38.2</b>	45.1	51.9
Net Revenue		2,103.7	2,188.4	2,775.4	<b>2,103.7</b>	2,188.4	2,775.4
Operating Costs		532.8	532.8	532.8	<b>576.7</b>	576.7	576.7
Capital Costs		127.6	127.6	127.6	<b>155.1</b>	155.1	155.1
Net Cash Flow, Pre-tax		1,443.3	1,528.0	2,115.0	<b>1,371.9</b>	1,456.6	2,043.6
Taxes		378.8	412.6	583.1	<b>360.1</b>	393.3	563.4
Net Cash Flow, After-tax		1,064.5	1,115.5	1,531.9	<b>1,011.8</b>	1,063.3	1,480.2
<b>Analysis</b>							
NPV @ 12%	US\$ M	137	176	215	<b>130</b>	168	208

Source: Coosa County Graphite Project, Preliminary Economics Assessment, 2015 and Crystal Equity Research Estimates

Table V: Historic and Projected Annual Financial Performance

Dollars in Thousands	2014A Year	2015A Year	2016A Year	2017A Year	2018A Year	2019E Year	2020E Year	2021E Year	2022E Year
Total revenue	-	-	-	-	-	-	900	16,900	84,750
Operating expenses:									
Mineral property expenses	3,502	4,470	3,248	4,584	3,538	3,800	5,500	6,000	6,500
General and administrative	9,132	7,488	7,650	6,614	7,357	7,500	8,500	9,000	10,500
Accretion of asset retirement obligations	425	450	480	1,039	993	600	1,000	1,000	1,000
Depreciation and amortization	331	336	247	142	116	160	160	160	160
Impairment of mineral properties	160	960	1,673	11,436	23,712	-	-	-	-
Other	-	3,048	-	1,003	333	-	-	-	-
Total operating expenses	13,550	16,752	13,298	24,818	36,049	12,060	15,160	16,160	18,160
Operating income (loss)	(13,550)	(16,752)	(13,298)	(24,818)	(36,049)	(12,060)	(14,710)	(13,710)	6,040
Other income (expense)									
Interest income	-	-	-	614	735	-	-	-	-
Interest expense	(2,368)	(2,645)	(2,800)	-	-	-	-	-	-
Gain on derivatives	2,919	-	-	-	-	-	-	-	-
Gain on uranium properties	2,313	4,268	-	4,927	104	-	-	-	-
Loss on extinguishment of convertible debt	-	-	(3,322)	(39)	-	-	-	-	-
Other, net	2	(14)	(185)	28	(474)	-	-	-	-
Total other income (expense)	2,866	1,609	(6,307)	5,530	365	-	-	-	-
Income (loss) before income taxes	(10,684)	(15,143)	(19,605)	(19,288)	(35,684)	(12,060)	(14,710)	(13,710)	6,040
Provision for income taxes (benefit from)	-	-	-	-	-	-	-	-	1,812
Unrealized change in value, mkt. securities	-	(67)	(49)	287	(861)	-	-	-	-
Realized loss on sale securities	-	-	116	-	484	-	-	-	-
Net income (loss)	(10,684)	(15,210)	(19,538)	(19,001)	(36,061)	(12,060)	(14,710)	(13,710)	4,228
Net EPS (LPS), comprehensive	\$ (5.28)	\$ (5.65)	\$ (3.72)	\$ (0.77)	\$ (0.77)	\$ (0.16)	\$ (0.15)	\$ (0.13)	\$ 0.04
Wtd shares outstanding, diluted in 000s	2,023	2,691	5,252	24,737	46,384	76,828	106,078	106,578	108,578

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## ANALYST

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The analyst who is primarily responsible for this research and whose name is listed first on this front cover certifies that: 1) all of the views expressed in this research accurately reflect his or her professional views about any and all of the subject securities or issuers, and 2) no part of any of the analyst's compensation was, is or will be directly or indirectly related to the specific rating expressed by analyst in this research.

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Buy	Price appreciation expected 10% or more over a 12-month period.
Hold	Price appreciation/depreciation expected between 10% and -10% over 12 months.
Sell	Price depreciation expected 10% or more over a 12-month period.

## CRYSTAL RESEARCH UNIVERSE

Buys	70%
Holds	5%
Sells	<u>25%</u>
Total	100%

## HISTORICAL RECOMMENDATIONS AND TARGET PRICE: Westwater Resources / WWR

<u>Report</u>	<u>Date</u>	<u>Price</u>	<u>Rating</u>	<u>Target Price</u>
Initial	4/10/18	\$0.53	Buy	\$1.50
Update	5/24/18	\$0.42	Buy	\$1.50
Update	7/2/18	\$0.40	Buy	\$1.50
Update	8/14/18	\$0.30	Buy	\$1.50
Update	11/13/18	\$0.20	Buy	\$1.50
Update	12/20/18	\$0.16	Buy	\$1.50
Update	2/26/19	\$0.14	Buy	\$1.50



**DISCLOSURES**

<u>Name</u>	<u>Symbol: Exchange</u>	<u>Disclosures</u>
Westwater Resources, Inc.	WWR: Nasdaq	D*

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- A A member or employee of Crystal Equity Research, LLC serves on the board of directors of the company.
- B A controlling member of Crystal Equity Research, LLC has a beneficial interest in the common stock of the company.
- C A person or persons preparing this report or an immediate family member of the preparer has a beneficial interest in the common stock of the company.
- D Crystal Equity Research, LLC received compensation for research coverage from the company or one of its agents. The fees are paid in advance in cash.
- E The company has a convertible issue outstanding.
- F The securities covered in this report can be optioned.
- G The securities covered in this report can be margined.

\* *Crystal Equity Research previously published research on Alabama Graphite and received compensation from the company.*

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