AMERICAN-MADE BATTERY-GRAPHITE PRODUCTS

COOSA GRAPHITE PROJECT

BUSINESS PLAN

October 2019
AMERICAN-MADE
BATTERYGRAPHITE
PRODUCTS

COOSA BUSINESS PLAN
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  Westwater Resources’ Competitive Advantages

BATTERY-READY GRAPHITE PRODUCTS
  Product tradename: ULTRA-PMG™
  Product tradename: ULTRA-DEXDG™
  Product tradename: ULTRA-CSPG™
Westwater Resources’ flagship Coosa Graphite Project, located in central Alabama. The Company controls 100% of the mineral rights of the nearly 42,000-acre land package in the past-producing ‘Alabama Graphite Belt’
EXECUTIVE SUMMARY

THE COMPANY

Westwater Resources, Inc. (Westwater Resources) is a 40-year-old, public company trading on the NASDAQ stock exchange under the symbol WWR. Originally incorporated to mine uranium in Texas, our company has been reborn as a diversified energy materials developer. Westwater Resources now has a presence in uranium, lithium exploration, and battery-graphite materials with its Coosa Project in Alabama.

Alabama Graphite, a subsidiary of Westwater Resources based in the state of Alabama, is a developer of high-purity natural flake-graphite materials that are essential components for high-technology battery applications. Combined, the companies possess a unique combination of battery materials knowledge and extensive project-execution experience, coupled with decades of capital markets expertise which makes this business a powerful presence in the new energy marketplace.

THE BATTERY MARKET — GRAPHITE IS A CRITICAL COMPONENT

The global battery market is $86 billion dollars in size and growing at a rate of 7% in 2016 (Sanders, 2018). The greatest share of this market is made up of:

- **Li-ion batteries** — these are rechargeable lithium-based batteries used in everything from cellphones and hand tools to laptop computers and electric vehicles.

- **Primary Lithium batteries** — these are non-rechargeable, lightweight lithium-based batteries like those used in flashlights, smoke detectors, and applications where long life and lightweight matters most.

- **Lead Acid** — these are the workhorse batteries used in automobiles and back-up power supplies and other energy-storage applications where weight is less important than capacity, and make up about 80% of the storage capacities in gigawatt-hours (GWh) of all batteries presently sold worldwide (Sanders, 2018).
• **Alkaline Power Cells** — these are the most popular consumer batteries in the world, with more than 10 billion units produced worldwide each year (Roskill, 2017).

All of these batteries use graphite as a critical, non-substitutable constituent.

THE WESTWATER RESOURCES ADVANTAGE

Our business plan is to develop a battery-graphite manufacturing business in Alabama that produces advanced, high-quality and high-margin products for battery manufacturers. Critical steps in this business plan are:

• Constructing a processing facility that purifies graphite concentrates to 99.95% pure carbon. This construction is planned for 2022 based upon pilot-plant results developed in 2021, using industry standard processes.

• Westwater has secured a supply agreement for graphite concentrate that supports production through mine construction, scheduled for 2028.

• Post-processing purified graphite into three component products needed for battery manufacturing:
  
  o **Purified Micronized Graphite** (PMG)
  
  o **Delaminated Expanded Graphite** (DEXDG)
  
  o **Coated Spherical Purified Graphite** (CSPG)

• Developing customers for our products. To execute this critical function, we have non-disclosure agreements in place with potential customers, and products at those entities for pre-qualification testing.

• Developing a new graphite mine (planned for start-up 2028) on our 40,000-plus-acre mineral-rights holdings that can serve as a hedge against future feedstock costs and
provide in-house quality assurance and quality control (QA/QC) for raw-material inputs.

Our broad base of manufacturing, mining and processing expertise from graphite, base and precious metals to energy minerals is our key competitive advantage. Over the last 40-plus years, members of our team have operated mining, processing and manufacturing facilities ranging in size from small to more than a billion dollars and have the experience required to successfully execute this business plan.

**THE COOSA GRAPHITE PROJECT PLAN AND ECONOMICS**

- Pilot plant start-up expected in 2020 generating products for pre-qualification in large batches to facilitate sales contracts.
- Exploration designed to expand Westwater’s vanadium discovery at Coosa begins in 2020.
- Full scale production expected on purchased feedstock in 2022 producing battery graphite
- Mining to begin in 2028

**Project Economics**

- Project Capex $54.5 million by 2022
- First positive cash flow in 2022
- Project pretax NPV-8% to be $480 million
- Project pretax internal rate of return = 41%
- Vanadium exploration can enhance these economics! (Please see pages for details)

<table>
<thead>
<tr>
<th>Project</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>Line Item Total</th>
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<td>$6.6</td>
<td>$7.7</td>
<td></td>
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<td>Processing Facility</td>
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<td>$16.6</td>
<td>$54.5</td>
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</table>

*All estimates include 15% contingency and allowance for working capital*
Mine and Expansion Built from Cash Flow in 2027
Max Capex Outlay $54.5 million by 2022
COMPANY OVERVIEW

BUSINESS CONCEPT

Westwater Resources, Inc. (“Westwater Resources” or “the Company”), through its wholly owned subsidiary Alabama Graphite Company, is a developer of high-purity, natural-flake graphite materials that are essential components for high technology battery applications. Westwater Resources has a highly successful 40-year history of exploring for (and discovering), developing and producing energy minerals in the United States. Listed on the NASDAQ exchange (NASDAQ: WWR), Westwater Resources brings project execution experience, coupled with decades of capital-markets expertise to this business. The Company is working to fast-track the construction of a graphite processing facility in Alabama intended to produce advanced high-purity battery-graphite materials for battery manufacturers in North America and the world.

The explosive growth of electrically powered automobiles and personal electronic devices is driving an increasing need for batteries and the materials required to manufacture these high-technology electrical storage devices. Graphite is essential in the development of state-of-the-art batteries, and it is a component for which there is no substitute. Westwater Resources is front and center in the rapidly growing battery materials market, with its Coosa Graphite Project — the largest and most advanced natural-flake graphite project in the contiguous United States. Located in central Alabama, the Coosa Graphite Project is slated to produce battery-graphite products in 2022, and is made up of two pieces:

- A graphite purification and processing facility scheduled to be built and in operation by late 2022; and
- A mine and mill scheduled to be built and operational in 2028.

OUR GOAL AND OUR VALUES THAT SUPPORT IT

Westwater Resources’ goal is to be a reliable, premium-quality, low-cost producer and supplier of high-purity battery materials made in the United States. Our Core Values are essential to achieving our goal, and they center on three areas of successful business execution:
Safety:
• Of each other;
• Of our environment;
• Of the communities where we work;
• Of our assets; and
• Of our reputation.

Cost Management:
• Effective and efficient use of our shareholders’ assets; and
• Relentless focus on first-quartile cost performance.

Reliability and Integrity:
• Highest level of performance every day;
• Improving our processes;
• Conservative promises well kept; and
• Using, without fail, high ethical standards while conducting our business.

We are committed to being a good corporate citizen by safeguarding our employees, operations, neighbors, and the communities where our employees and stakeholders live and work.

BUSINESS DESCRIPTION
Westwater Resources will develop advanced battery-graphite materials for the fast-growing electric transportation, grid-power storage and personal electronic device energy-storage markets. With many years of management experience in the space, proven technology for production of battery graphite, and products already at various stages of qualification by potential customers, we are ready to take the important next steps in our evolution. These next steps are:

• Completing pilot scale studies in 2019-2021:
  • This serves as the foundation for the design of the commercial-scale processing facility; and
  • Materials from this phase will be used for further customer-development and product-qualification work.
Designing and constructing the graphite processing facility for production in 2022:

- The graphite purification plant will be built in central Alabama, near the Coosa Graphite Project and will produce advanced battery-graphite products.
- Alabama is a “business-friendly” jurisdiction and has successfully drawn Mercedes-Benz, Honda, Toyota, Hyundai, and the Toyota-Mazda joint venture to the state for automobile manufacturing.
- Mercedes-Benz (Daimler AG) announced that they are bringing a billion-dollar battery factory to the area to complement their existing Alabama based automobile manufacturing facilities.

Purchasing graphite feedstock until 2028:

- The Company has secured a supply agreement to provide the Coosa Project with graphite concentrate for the first years of operation.

Constructing the mine and mill for operations in 2028:

- The Coosa Graphite Project property is located between Birmingham and Montgomery, Alabama.
- The graphite concentrate mined from the Coosa Graphite Project property will serve as the source of feedstock for the graphite processing plant beginning 2028.

Battery consumption is rising at an accelerated growth rate due to recent and robust developments in electric-automobile markets, personal electronic devices and electrical grid storage, an enabling technology for wind and solar power installation. The global shift towards low- and zero-emissions vehicles and power sources will continue to drive increasing demand for graphite-battery materials for the foreseeable future.

Recent developments in this sector include:

- The United Kingdom and France have announced a prohibition on the sale of gasoline- and diesel-powered vehicles by 2040. Electric vehicles using battery storage are the only currently viable technology that can satisfy the demands for new cars mandated by these nations;
- China, the largest new-car market in the world, has mandated that 8% of all new cars sold are to be plug-in hybrid, battery electric or fuel-cell powered;
- Volvo has vowed to cease production of automobiles that rely solely on internal combustion engines, promising that every vehicle built after 2019 will have an electric motor;

Every major automobile company has developed, or is developing, an electric-based technology to replace internal-combustion engines;
• Governments around the world continue to incentivize electric-vehicle ownership through subsidies and other incentives; and

• The installed base of wind and solar power electrical-generating systems is increasing every year. Grid battery storage is the answer to increasing system reliability and unlocking the value of these power sources.

Westwater Resources is developing graphite-purification technology and advanced product-development processes to meet the demands of these customers, as well as the broad base of existing consumers for battery-graphite materials.

THE CHALLENGE FOR BATTERY MAKERS
The real challenge for battery manufacturers is that the sole source of battery-grade graphite is China, presenting the global battery industry with significant risks for their businesses:

• **Supply Chain Management Risks:**
  • A single source of supply, without diversification, risks disruption ranging from weather and normal logistics issues, to political risk and tariffs; and
  • A single source can present unique and unsolvable quality assurance and quality control (QA/QC) issues for battery manufacturers.

• **Economic Risk:**
  • Exposure to a single foreign currency can cause price fluctuations that are uncontrollable for the battery manufacturers.

• **Environmental Unsustainability:**
  • China’s graphite producers are generally not held to the type of environmental performance standards that prevail in the United States; and
  • Battery consumers are fast becoming sensitive to the origin of the materials that go into their electronic devices and vehicles, and the use of poor environmental stewardship in non-US operations can cause controversies at the consumer level.

**Critical domestic production is absent in the United States:**

• A Presidential Executive Order includes graphite on its list of minerals critical to the safety and security of the United States. With no domestic graphite production of any kind, the United States is presently required to source all of its battery graphite from China.
THE SOLUTION: WESTWATER RESOURCES

Westwater Resources is developing methodologies and facilities to produce high purity, battery-graphite products in the State of Alabama. These products are designed to address all major battery sectors, including Li-ion, primary-lithium, lead-acid, and alkaline batteries. In addition, the processes we intend to use are environmentally sustainable and permittable in the United States — where a robust regulatory environment complements our Core Values to reliably deliver safe, well-made products to our customers.

Our business plan is further based upon acquiring graphite concentrates from environmentally responsible suppliers for the first several years of operations, subsequently producing graphite from our more than 40,000-acre mineral lease site in Coosa County, Alabama. The timing of our project allows us to accommodate proper, detailed, environmentally sensitive designs for the mine and allows Westwater Resources to build processing facilities that commence production in 2022. In the meantime, Westwater Resources is working with more than 30 companies to test laboratory-scale battery-graphite products for possible introduction to their production facilities.

As a critical first step, Westwater has now secured a supply contract for graphite concentrates from a reliable source.

The Westwater Resources team has decades of experience in various mineral mining and processing environments — from base to precious metals and energy materials, at all stages of development and production throughout the world. Our wide range of in-house experience, combined with top-tier laboratories to help develop our battery graphite processes and products, will ensure our success in supplying the battery manufacturing sector with the materials needed to satisfy the fast-growing demand for energy storage.
WHAT IS GRAPHITE?
WHAT IS GRAPHITE?
Graphite is the name given to a common form of the element carbon. Occurring naturally as a mineral in numerous deposits around the world, graphite is used in many industrial applications. These end uses take advantage of graphite’s natural characteristics of high lubricity, high resistance to corrosion, ability to withstand high temperatures while remaining highly stable, and excellent conductivity of heat and electricity.

In recent years, graphite has become an essential component for the electrodes used in the production of new and old technology battery materials. This role will continue to be important as demand for these batteries increases with the world’s growing electric vehicle and energy-storage needs.

Natural flake graphite is increasingly supplanting the use of synthetic graphite in battery applications, for cost and performance reasons. Through a series of sophisticated and precise processing steps, flake graphite concentrates are transformed into high-value end products for the battery industry, specifically Purified Micronized Graphite (PMG) and Delaminated Expanded Graphite (DEXDG), used as conductivity-enhancement additives for the manufacture of cathodes for a number of battery-material families (both rechargeable and non-rechargeable batteries), and Coated Spherical Purified Graphite (CSPG) for the manufacture of anodes in Li-ion (rechargeable) batteries.
A FEW WORDS ABOUT LI-ION BATTERIES

The rechargeable (or secondary) lithium-ion (Li-ion) battery is the dominant power source for modern electric vehicles. Although most people have heard of Li-ion batteries, few understand exactly how they function, and why graphite is such an important element in their construction. Each battery consists of numerous subcomponents called cells. The electrical current reaches the cells via metallic conductive surfaces.

As with all modern batteries, Li-ion batteries contain electrodes, to allow the electricity to flow. The cathode is the positive electrode during battery use or discharge and contains high-purity Lithium oxide. The more uniform its chemical composition, the better the performance and life of the battery will be. On the other side of the battery is the anode, which is the negative electrode during use or discharge. This is made of graphite — a form of carbon with a layered structure.

The battery cells are filled with a transport medium known as the electrolyte which allows the Lithium ions that carry the battery’s charge to flow freely. This electrolyte must be extremely pure and as free of water as possible, in order to ensure efficient charging and discharging.

To prevent a short circuit and premature discharging of the battery, there is an insulating layer between the two electrodes called the separator, which is permeable to the Lithium ions only, via micro-porosity. When a Li-ion battery is being charged, the positive Lithium ions pass from the cathode, through the separator, and into the layered graphite structure of the anode. The graphite anode has a carefully engineered microstructure that is particularly amenable to the storage of the Lithium ions during this electrochemical process. Once the anode has been fully loaded with the Lithium ions, the battery is charged.

When the battery is being discharged through use, the flow is reversed, as energy is removed from the individual battery cells. The Lithium ions travel via the electrolyte, through the separator, back to the cathode. The motor of an electric vehicle converts the electrical energy provided by the battery into mechanical energy, propelling the vehicle forward.

The durability and amount of energy available in the battery is closely related to the quality of the materials used. Though it is sometimes overlooked during discussions about other input materials such as Lithium and cobalt, it is clear that graphite plays a critical role in the function of a Li-ion battery. For all Li-ion-battery input materials, higher quality, purer materials, along with customized formulations lead to longer battery life and better battery performance.

When it comes to graphite, Westwater can help battery manufacturers achieve the quality and performance that they require.
The special properties of Li-ion batteries — such as their high charge and discharge speeds, high capacity, and high energy density — are due mainly to the electrode materials. The negative electrode is made of anode graphite, specifically, Coated Spherical Purified Graphite or CSPG, while the positive electrode is made of various Lithium-based compounds containing metals such as manganese, cobalt, aluminum, nickel or iron. These compounds form microscopic tunnel-like structures in which Lithium ions are stored during charging and from which they are released again during discharging.
THE $86-BILLION GLOBAL BATTERY MARKET AND WHY GRAPHITE IS IMPORTANT
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BATTERY GRAPHITE

More than 200 industrial applications call for the use of natural flake graphite, but one demand driver dominates all others for the foreseeable future — batteries.

There is a profound difference between industrial, conventional flake-graphite concentrate and specialty-refined, battery graphite. The latter is a premium technology input material, critical to the battery supply chain.

High-margin battery-graphite demand consistently exceeds the most robust demand forecasts. Flake graphite concentrate is transitioning to a feedstock commodity for the battery-graphite market. As such, mining graphite is not immediately required for Westwater Resources. Additionally, because of the unique electrical and thermal characteristics of natural flake graphite, there is little threat of substitution and the long-term outlook for battery graphite is strong.

Natural battery-graphite products are derived from flake graphite that has been transformed through a series of specialty downstream processes. These processes include, but are not limited to:

- **Purification** to battery-grade carbon as graphite (Cg) content of greater than or equal to (≥) 99.95%;
- **Micronization** (sizing);
- **Intercalation** (expansion);
- **Delamination** (sheering);
- **Spheronization** (shaping);
- **Classification** (sorting); and
- **Surface treatment** (carbon coating).
Li-ion Batteries (rechargeable)

Alkaline Batteries (non-rechargeable)
Primary-Lithium Batteries (non-rechargeable)

Lead-Acid Batteries (rechargeable)
The four major battery-market segments all require battery-graphite products and are as follows:

- **Li-ion** — the fastest-growing battery-market segment with significant, enduring demand and limited/constricted additional capacity. These rechargeable batteries are used in portable, rechargeable electronic devices, such as mobile telephones, tablets, laptop computers, and power tools, electric vehicles and grid-storage/stationary batteries for energy-storage systems.

- **Primary Lithium** — a rapidly growing battery market. These are powerful, lightweight non-rechargeable batteries, used in battery applications when the greatest possible weight reduction is required. They are also used for specialty applications, in particular where miniaturization or longer-term discharges are required.

- **Lead Acid** — the foundation product of the battery industry, lead-acid batteries are the dominant rechargeable battery technology, and they account for 50% of the more than $75 billion annual rechargeable-battery market (Roskill, 2017).

- **Alkaline** — the most popular consumer battery in the world, non-rechargeable alkaline batteries account for 80% of manufactured batteries in the United States and more than 10 billion individual units are produced worldwide every year. These account for 20% of the $86 billion annual global battery market in 2016 (Sanders, 2018).

Westwater Resources is working to develop products for all potential major battery markets. The Company believes that all of these battery markets should be addressed, unlike many of our peers that gravitate towards Li-ion batteries as a final market. Note that primary-lithium, lead-acid and alkaline battery manufacturers have significantly shorter and less onerous qualification requirements compared to large-scale Li-ion battery manufacturers.

Process technologies to manufacture battery-graphite products are complex and require an in-depth understanding of graphite chemistry. There is formidable graphite expertise in both Europe and North America, and we intend to make use of this expertise, in addition to our own capabilities, as we develop our business.

Westwater Resources is confident in its ability to build a world-class, American-based, green-energy supply-chain producer. Since 2015, Westwater has been working diligently on all aspects of battery-graphite product development and has successfully produced some of the highest-performing battery-graphite products, including:

- **Purified Micronized Graphite (PMG)** conductivity-enhancement materials for Li-ion, Primary-Lithium, Lead-Acid, and Alkaline battery markets;

- **Delaminated Expanded Graphite (DEXDG)** conductivity-enhancement materials for Li-ion, Primary-Lithium, Lead-Acid, and Alkaline battery markets; and
Coated Spherical Purified Graphite (CSPG) for Li-ion battery anodes. Approximately 95% of a Li-ion battery’s anode is comprised of CSPG and there is 10 to 30 times more specialty anode graphite required for the production of these batteries than there is lithium in a Li-ion battery.

Moving forward, Westwater Resources’ vertically integrated battery-graphite manufacturing plans will allow the Company to manufacture some of the highest quality, environmentally responsible, US-made battery-graphite – for multiple battery electro-chemistries.

The US and global green-energy and clean-technology industries are undergoing unprecedented change and widespread adoption. The proliferation of electric vehicles and their need for large-format Li-ion batteries has made the United States the focus of the new-age automotive industry.

TRANSPORTATION
- Global electric vehicle sales projected to be half of the global market in 2040 – a 25 fold increase from 2019
- Transportation sector accounts for 23% of greenhouse gas emissions, accelerating demand for low emission alternatives

ENERGY STORAGE
- Demand is expected to be driven by grid and peak demand management
- The enabling technology for renewable energy
- Storage battery demand growth more than 11% per year

CONSUMER ELECTRONICS
- Demand growth will be supported by smart phone, portable PC and tablet battery demand

Synthetic-graphite consumption by anode manufacturers is expected to grow because of the concentration of the industry in China; however, natural flake-graphite demand is forecast to grow at a higher rate because of natural graphite’s performance and cost efficiencies when compared to synthetic graphite.

Westwater Resources is working with potential customers in several battery markets, including the lead acid, alkaline power cell and lithium Ion spaces. This work includes providing samples for testing, and one manufacturer has ordered a 1 metric ton sample to test further. There are numerous major electric vehicle, stationary/grid-storage and Department of Defense Li-ion battery manufacturers in the United States. Our research and
development efforts are ongoing with advanced products and partners in the United States and overseas.

The graph below illustrates the growth in battery-material requirements for five years ending in 2019.

All input material types

Source: Benchmark Mineral Intelligence 2016
Global Li-ion production capacity will increase by 521% between

By 2020, mass production of Li-ion batteries will still be concentrated in just four countries (USA, China, South Korea, and Poland)

*Source: Desjardins, 2017*
Future CSPG demand will be driven by Global Gigafactory/Megafactory Expansions

Capacity increases in the Li-ion-battery space will drive demand for CSPG as shown above (Benchmark Mineral Intelligence, 2017). This is a critical material for the anodes of these energy-storage units and will continue to be driven by the transportation sector.
THE ‘MADE-IN-USA’ SOLUTION

Our Coosa Graphite Project is situated in the most advantageous location of any graphite project currently underway on the North American continent. The Coosa Graphite Project is located in an established, business-friendly jurisdiction — the State of Alabama. It has excellent infrastructure, a year-round temperate climate, and significant support from stakeholders and the local and state governments.

The project has ready access to the American market, offering US customers a ‘Sourced-in-USA’ and ‘Made-in-USA’ solution. This, in turn, may afford end users the associated US sourcing benefits as they pertain to the US Federal Trade Commission’s Made-in-USA Labeling Act and US materials sourcing claims (source: US Federal Trade Commission, 2014).

Westwater Resources, has the ability as a public company, to access US capital markets. This represents a distinct advantage over other potential graphite producers, domestic or foreign.

We believe the 50-plus flake graphite development companies advancing mining projects outside of China will likely continue to face challenges because the market for conventional, primary-processed (unfinished) graphite concentrate is well supplied. Management believes that (finished) specialty battery graphite for energy storage is the only flake-graphite application where there will be significant, enduring future demand. Alabama Graphite has advanced the development of the Coosa Graphite Project and has enhanced the Company’s prospects in the US market for superior-quality, high performance, specialty battery-graphite products.

Alabama Graphite is committed to the successful optimization of the commercial potential of its US-made, high-quality, specialty battery-graphite business strategy. The Company’s true purpose is to build an enduring, world-class US supply-chain solution to address the US green-energy battery industry. Our management is confident that by remaining focused on this mission, the Company will prevail in executing its long-range growth strategies, thereby significantly increasing long-term value for shareholders.

We believe that the need to grow US battery-graphite processing capacity and supply is now critical, and Westwater is intent on servicing that need.
CUSTOMER ANALYSIS AND CUSTOMER SEGMENTATION
CUSTOMER ANALYSIS AND CUSTOMER SEGMENTATION

Westwater Resources’ customer base falls into four major battery market segments — **Li-ion**, **Primary-Lithium**, **Lead-Acid** and **Alkaline** battery manufacturers — representing the largest, most diversified battery markets in the battery industry. Of the executed nondisclosure agreements the Company currently has with potential end users, most of our potential customers are based in the United States.

The needs of potential customers vary by battery market. Li-ion-battery clients are looking for a consistently high-performing anode material — **Coated Spherical Purified Graphite (CSPG)** — with a high reversible and irreversible capacity, and a long, stable cycle life. However, Li-ion-battery companies are also concerned with improving cathode performance and have expressed strong interest in both of Westwater Resources’ cathode conductivity enhancement products — our premium **Purified Micronized Graphite (ULTRA-PMG™)** and our ultra-premium, high-performance **Delaminated Expanded Graphite (ULTRA-DEXDG™)**. All three of Westwater’s core battery-graphite products are applicable to Li-ion-battery end users.

For primary-lithium, lead-acid and alkaline batteries, cathode conductivity-enhancement additives are key to optimizing battery performance. Westwater Resources’ PMG is ideal for the largest, most established battery market in the world — lead-acid batteries, representing approximately 80% of the storage capacity (in Gigawatt hours or GWh) for all batteries. Historically, the lead-acid-battery industry has used carbon black as a conductivity enhancer. However, one of the world’s largest suppliers to the lead-acid-battery industry, demonstrated that as little as 1wt.% (total percentage by weight) addition of Westwater Resources’ PMG to the negative plate of a lead-acid battery can impart significant performance improvements. Dynamic Charge Acceptance (DCA), a key performance metric in lead-acid-battery testing, improved 194% with our PMG product, with a minimal increase in potential cost.

Our ultra-premium, American-made **ULTRA-DEXDG™** offers superior performance improvements to Li-ion, primary-lithium and alkaline batteries without significantly impacting costs to the battery manufacturer. Corporate social responsibility (CSR), environmental sustainability and best practices, which are an integral part of Westwater Resources’ products and Core Values, are increasingly important
to battery manufacturers. The added unique advantage of a 100% ‘Made-in-USA’ solution is of particular interest to US automobile and battery producers.

### Battery Markets Summary

<table>
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<tr>
<th>Battery Market Segment</th>
<th>Primary/Secondary</th>
<th>Rechargeable</th>
<th>CAGR</th>
<th>Automotive Applications</th>
<th>Demand Drivers</th>
<th>Year Invented</th>
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<td>Li-ion</td>
<td>Secondary</td>
<td>Yes</td>
<td>17%</td>
<td>Yes</td>
<td>portable energy storage (electric vehicles, electronic devices, grid storage/stationary storage)</td>
<td>1991</td>
<td>type of rechargeable battery in which lithium ions move from the negative electrode to the positive electrode during discharge and back when charging.</td>
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<td>Primary Lithium</td>
<td>Primary</td>
<td>No</td>
<td>4.06%</td>
<td>No</td>
<td>automotive, electronics, asset tracking, automation, safety/security, military, aerospace, medical (e.g. pacemakers and medical implants), computer memory protection, utility meters, industrial/medical instrumentation</td>
<td>1972</td>
<td>primary-lithium batteries are the most energy-dense electrochemical cells.</td>
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<tr>
<td>Lead Acid</td>
<td>Secondary</td>
<td>Yes</td>
<td>1.10%</td>
<td>Yes</td>
<td>automotive (starting, lighting, and ignition [SLI]; industrial, including traction and stationary applications, small portable equipment; sealed lead acid (SLA))</td>
<td>1859</td>
<td>invented in 1859 by French physicist Gaston Planté and is the oldest type of rechargeable battery. Despite having a very low energy-to-weight ratio and a low energy-to-volume ratio, their ability to supply high surge currents means that the cells have a relatively large power-to-weight ratio.</td>
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<td>4.60%</td>
<td>No</td>
<td>Premium products, consumer applications, remote controls, flashlights, clocks, toys</td>
<td>1899</td>
<td>primary battery dependent upon the reaction between zinc dioxide (ZnO2) and manganese dioxide (MnO2)</td>
</tr>
</tbody>
</table>

An overview of the major battery markets is as follows:
<table>
<thead>
<tr>
<th>Battery Market Segment</th>
<th>Needs</th>
<th>Westwater Resources Product(s)</th>
</tr>
</thead>
</table>
| Li-ion                 | High-performance graphite-anode material; conductivity enhancement material (cathode) | ULTRA-DEXDG<sup>TM</sup>  
ULTRA-CSPG<sup>TM</sup> |
| Primary Lithium        | Conductivity-enhancement material (cathode) | ULTRA-PMG<sup>TM</sup>  
ULTRA-DEXDG<sup>TM</sup> |
| Lead Acid              | Conductivity-enhancement material (cathode) | ULTRA-PMG<sup>TM</sup> |
| Alkaline               | Conductivity-enhancement material (cathode) | ULTRA-PMG<sup>TM</sup>  
ULTRA-DEXDG<sup>TM</sup> |
COMPETITIVE ANALYSIS

THE FUTURE IS GREEN
As a result of the burgeoning battery/electric-vehicle industry, the US and global green-energy and clean-technology industries are undergoing unprecedented change and widespread adoption. Even with widespread proliferation, electric vehicles still only account for less than one percent of the automotive market. There are numerous major battery manufacturers in the United States — and Westwater is currently in discussion with a number of these potential American end users.

BATTERY-GRAFPITE PURIFICATION
Without question, purification is the most critical step in the manufacturing of battery graphite products. If one cannot purify graphite concentrate or feedstock to battery grade, the subsequent transformation processes and technologies will not be effective and will have little relevance. No battery manufacturer will purchase battery graphite if the finished graphite product is less than 99.95% pure. Regardless of the finished product, purification is the rate-limiting step of the battery-graphite transformation process.

There are three known graphite-purification technologies capable of purifying natural flake graphite to battery-grade purity. Two of the purification technologies are established, continuous, commercial-scale processes (acid leaching and thermal purification) while the third technology (carbochlorination or chlorine-based purification), while capable of achieving the highest graphite purity ever achieved, is a small-scale batch or non-continuous process.
Graphite Concentrate
(feedstock material @ ≥95% Cg)

ACID-LEACHING PURIFICATION
~99.98% purity
(Hydrofluoric and Hydrochloric acid-based purification)
- Continuous, commercial process
- Well established, well understood
- The dominant graphite purification technology in the world

THERMAL PURIFICATION
~99.98% purity
(high-temperature nitrogen-gas-based purification)
Continuous, commercial process, established in the 1970s
- 1 tonne per hour capacity
- Operates at ~ 2,500 °C
- Based on expired patent
- Lowest OPEX
- 70% of OPEX is electrical power

CARBOCHLORINATION PURIFICATION
~99.99+% purity
(low-temperature chlorine-gas-based purification)
- Batch, non-commercial process
- Gram-scale quantities/capacity
- Operates at ~ 1,300 °C
- Highest OPEX/CAPEX
- Can achieve the highest purity of all purification technologies
- Utilized for high-value, non-battery applications (e.g. aerospace, defense)
**GRAPHITE-PURIFICATION TECHNOLOGIES**

A continuous-process purification technology involves removing the graphite’s naturally occurring elemental impurities at each step of the process — with no breaks in time, sequence, substance, or extent. A continuous process can save time, energy and costs. Conversely, a batch or semi-continuous process, as the terms suggest, involves the purification of graphite concentrate in discrete batches. Purification of subsequent batches of graphite must wait until the current batch has completed the purification cycle in the furnace. This method seems economically viable and effective at first glance, but in most cases, falls short of continuous flow and the associated cost efficiencies, quality control and ability to produce quantities required. The advantages of a continuous purification process are clear — saving time, purifying more material and expending less energy. The end result is a leaner, more cost-effective business strategy.

Through its pilot-plant process, Westwater Resources will develop the thermal-purification technologies as a test for economic and practical viability. Purification has no impact on the subsequent technologies utilized to transform the purified graphite into the various battery-graphite technologies.

**SUPERIOR PRODUCT ENGINEERING, RESEARCH AND DEVELOPMENT**

Another significant competitive advantage of Westwater Resources is the Company’s product-engineering capabilities. Aside from our Purified Micronized Graphite (ULTRA-PMG™) and Coated Spherical Purified Graphite (ULTRA-CSPG™) products, Westwater has been engaged in the research and development of advanced, next-generation battery-graphite products for both rechargeable and non-rechargeable batteries. The most unique, advanced premium product is the Company’s ULTRA-DEXDG™ Delaminated Expanded Graphite conductivity-enhancement product, which has applicability in all major battery markets.

**100% Owner of an Alabama-Based Business**

Westwater Resources has materially advanced development of the Coosa Graphite Project and notably enhanced the Company’s prospects of future leadership in the American market for superior-quality, high-performance specialty graphite products.
The only flake-graphite application with significant, enduring future demand is specialty battery graphite. The critical metrics/parameters relevant in assessing a battery graphite company are:

- Has the company demonstrated that it can produce a consistent, high-performance graphite product that meets or exceeds the requirements of battery manufacturers?
- Is it able to do so at a low cost?

Westwater Resources’ test results and plan demonstrates that the Company is able to accomplish the task.

**PEER COMPARISON SUMMARY**

**Graphite Development Companies (outside of China and India)**

**North America**

**United States of America** • Westwater Resources, Inc. (Coosa County, Alabama)

- Graphite One Resources Inc. (Nome, Alaska)
- Global Li-Ion Graphite Corp. (near Carson City, Nevada and Toamasina, Madagascar)

**Canada**

- Berkwood Resources Ltd. (Baie-Comeau, Québec)
- Canada Strategic Metals Inc. (Mont-Laurier, Québec)
- CKR Carbon Corporation (Southern Québec & Bethanien District, Namibia)
- Cavan Ventures Inc. (Ontario and Québec)
- Eagle Graphite Incorporated (Slocan Valley, British Columbia)
- Focus Graphite Inc. (Fermont, Québec)
- Graphite Energy Corp. (Mont-Laurier, southern Québec)
- Great Lakes Graphite Inc. (Mayo, Québec)
- Lomiko Metals Inc. (Laurentians, Québec)
- Mason Graphite Inc. (Baie-Comeau, Québec)
- Nevado Resources Corporation (Fermont, Québec)
- Noram Ventures Inc. (Kootenay, British Columbia)
• Northern Graphite Inc. (North Bay, Ontario)
• Ontario Graphite Ltd. (Kearney, Ontario)
• Gratomic Inc. (Buckingham, Québec) **Brazil**
• Paringa Resources Limited (Rio de Janeiro State, Brazil)
• Nouveau Monde Graphite Inc. (Matawinie, Quebec)

**Greenland**
• Alba Mineral Resource plc (Amitsoq Graphite Project; Southern Greenland)

**Norway**
• Skaland Graphite AS / LNS Group (Northern Norway, Skaland Mountains)

**Sweden**
• Leading Edge Materials Corp. (Flinders Resources Limited) (Gävleborg, Sweden)
• Talga Resources Ltd. (Norrbotten County, Northern Sweden)

**Finland**
• Beowulf Mining plc (south eastern Finland)

**Sri Lanka**
• Elcora Advanced Materials Corp.

**Madagascar**
• Next Source Materials Inc. (Energizer Resources Inc.) (Atsimo-Andrefana, Madagascar)
• BlackEarth Minerals NL (Atsimo-Andrefana, Madagascar and Western Australia)
• DNI Metals Inc. (Toamasina, Madagascar)

**Africa**

**Mozambique**
• Syrah Resources Limited (Cabo Delgado, Mozambique)
• Battery Minerals Ltd. (Metals of Africa Limited) (Cabo Delgado, Mozambique)
• Triton Minerals Ltd. (Cabo Delgado, Mozambique)
• Mustang Resources Ltd. (Cabo Delgado, Mozambique)

**Tanzania**
• Armadale Capital Plc. (southeast Tanzania)
• Black Rock Mining Limited (Morogoro, Tanzania)
• Discovery Africa Limited (Mtwara, Tanzania)
• Graphex Mining Limited (southeast Tanzania)
• Kibaran Resources Ltd. (Morogoro and Arusha, Tanzania)
• Magnis Resources Ltd. (Lindi, Tanzania)
• Volt Resources Limited (southeast Tanzania)
  Walkabout Resources Limited (southeast Tanzania)

(Tanzania’s president John Magufuli signs new mining bills into law; Tanzanian government now owns a minimum of 16% in mining projects; July 10, 2017)

Malawi
• Sovereign Metals Limited (Lilongwe, Malawi)

Namibia, Ghana, Guinea
• Castle Minerals Limited (Upper West Region, Ghana)
• Next Graphite, Inc. (Bethanien District, Namibia)
• Gecko Namibia (Windhoek, Namibia)
• SRG Graphite Inc. (formerly Sama Graphite Inc.) (Lola, Guinea)

South Korea
• Peninsula Mines Limited (South Korea)

Australia
• Anson Resources Ltd. (Western Australia)
• Archer Exploration Limited (South Australia)
• Buxton Resources Ltd. (Western Australia)
• Hexagon Resources Limited (Western Australia)
• Lincoln Minerals Limited (South Australia)
• Quantum Graphite Limited (formerly Valence Industries Limited) (South Australia)
• Renascor Resources Ltd. (South Australia)
• Crater Gold Mining Ltd. (Queensland, Northeast Australia)
• BlackEarth Minerals NL (Western Australia)
GRAPHITE PRODUCERS
(outside of China and India)

- AMG N.V. (Netherlands) / AMG Mining/GK Graphit Kropfmühl GmbH (Cabo Delgado, MOZAMBIQUE)
- GK Ancuabe Graphite Mine, S.A. (Ancuabe, Cabo Delgado, MOZAMBIQUE)
- Imerys Graphite & Carbon Switzerland SA / Imreys SA (France) (Otjiwarongo, NAMIBIA)
- Syrah Resources Limited (Cabo Delgado, MOZAMBIQUE)
- Skaland Graphite AS / LNS Group (Skaland Mountains, northern NORWAY)
- Bass Metals Ltd. (Toamasina, MADAGASCAR; formerly StratMin Global Resources plc)
  Zavalivskiy Graphite (Kirovograd region, central UKRAINE)
- Zavalye Graphite (Kirovohrad Oblast, UKRAINE)
- Eagle Graphite Incorporated (Slocan Valley, British Columbia, CANADA)

Of the entities listed above:

Besides Westwater Resources, there are two potential producers of graphite concentrate in the United States (Graphite One Resources Inc., based in Nome, Alaska which has one of the most remote, inaccessible graphite project locations, coupled with the highest CAPEX of any graphite development project in the world; and, Global Li-Ion Graphite Corp. in Carson City, Nevada which is an amorphous-graphite project and is not suitable for battery-graphite applications)

There are few CSPG producers outside of China and all are located in Asia (Mitsubishi Chemical Holdings and Japanese trading houses, e.g. Mitsui & Co., Ltd.)

There are a handful of battery-graphite conductivity-enhancement-materials producers outside of China (Superior Graphite Co., Asbury Carbons Inc., AMG Graphit Kropfmühl GmbH, and Nacional de Grafite Ltda.)

Westwater Resources has a distinct advantage as a first mover in the US advanced battery-materials space.
The global battery-graphite industry is comprised of producers of conventional graphite — both natural flake-graphite concentrate and man-made or synthetic graphite derived from a petroleum coke (a petroleum byproduct) — as well as specialty graphite processors.

Westwater Resources has the graphite purification and materials-development expertise required to bring a suite of commercial, high-performance, made-in-USA battery graphite products to market — and in the very near term. In order to be successful in the high-value, high-margin battery-graphite space, one must not only be an expert in graphite for specialty, technical applications, but also possess a full-spectrum understanding of the electrochemistry of the battery technologies themselves. In other words, knowing how to purify, size (micronize) and shape (spheronize) graphite is only part of the equation. One must also understand the specific science of the battery technology, in addition to the specific wants and needs of each individual battery manufacturer.

Current competitors, some with formidable production capabilities based in Asia, do not possess Westwater Resources’ unique technologies for producing low-cost, superior performing battery-graphite products — and in an environmentally sustainable manner. Westwater Resources’ extensive, proven technical and operational strengths, coupled with its world-class management team, provide the ability to acquire market share from leading battery-graphite materials producers. The following is a synopsis of Westwater Resources’ competitive advantages.

**Westwater Resources’ Competitive Advantages:**

- Purification Technologies
- Superior Product Engineering, Research and Development
- Made-in-USA Solution
- First-Mover Advantage
- Speed to Market
- Advanced, In-Discussion Relationships with Potential End Users
- 100% Owner of the Most Advanced Flake Graphite Project in the Contiguous United States (Sourced-in-USA products)
- Strong support from the State of Alabama
- Graphite Feedstock supply agreement in place.
MAJOR BATTERY MARKETS

Li-ion (rechargeable)

Primary Lithium (non-rechargeable)

Lead Acid (rechargeable)

Alkaline (non-rechargeable)
BATTERY-READY
GRAPHITE
PRODUCTS
BATTERY-READY GRAPHITE PRODUCTS

As battery manufacturers have different battery-graphite needs contingent on their particular battery electrochemistry, Westwater Resources’ products will not be generically marketed to the battery industry as a whole. Instead, the Company’s products are marketed to the specific individual battery market segments (Li-ion, Primary-Lithium, Lead-Acid, and Alkaline battery manufacturers).

The Company’s initial product offerings are designed to be its conductivity enhancement products — ULTRA-PMG™ and ULTRA-DEXDG™ Westwater’s initial target markets will be lead-acid-battery manufacturers and, concurrently, alkaline-battery manufacturers, as the evaluation and qualification timelines are comparatively shorter than that of the Li-ion-battery manufacturers. The Company has already begun qualifying its products with various battery manufacturers.

Our proposed products are detailed in the following pages. Note that technical data sheets for each of these products are listed in the Appendix.
Product tradename: ULTRA-PMG™

Product Description: Purified and sized graphite for battery-cathode conductivity enhancement. This product is intended for all four major battery markets due to its high performance and low cost. Battery markets/applications:

- Li-ion battery cathodes
- Primary-lithium battery cathodes
- Lead-acid battery cathodes
- Alkaline battery cathodes

Addressable Market Size (2017): 60,000 tonnes

Commercially available benchmark reference product: carbon black

Selling price: USD$2.50 per kg  
USD$2,500 per tonne

Source: RSR Technologies Inc.

Planned Selling Price: USD$3 to $5 per kg  
USD$3,000 to $5,000 per tonne

PMG is used as a conductivity-enhancement additive in Li-ion, primary-lithium, lead acid, and alkaline batteries. The largest demand driver for PMG is the lead-acid battery market. PMG is expected to displace carbon black as a conductivity-enhancement additive to the battery’s negative plate.

Westwater Resources’ ULTRA-PMG™ material has been tested by leading lead producer, they stated, "Westwater Resources’ ULTRA-PMG™ product outperformed all other standard commercially available carbon products we have tested, including carbon black. There are barely any impurities, and of the impurities none of them are even a remote concern for gassing in lead-acid batteries. This was the purest graphite product we have ever studied and analyzed — by a significant margin."
Lead-acid battery technology has existed for more than 150 years, is the oldest rechargeable battery electrochemistry, and still dominates the global energy-storage market. There are more than 254 million cars and trucks in the United States alone, each containing at least one lead-acid battery. The industry continues to improve lead-acid battery technology. Battery manufacturers are working to enhance lead-acid battery performance by utilizing PMG instead of carbon black and/or a hybridization of both PMG and carbon black.

Most technical parameters of modern lead-acid batteries are now markedly enhanced or can be enhanced to match the requirements of automotive original equipment manufacturers (OEMs), including, improved Dynamic Charge Acceptance (DCA), reduced water loss at normal and elevated temperatures, extra-long cycle life at high-rate partial state of charge, and steady performance at elevated temperatures.

Natural crystalline-flake graphite of high purity and conductivity is a new and improved additive to the composition of an ingredient of negative plates (the expander) in lead-acid batteries. Traditionally, the expander is represented by a homogenized co-processed composite of barium sulfate, carbon black and lignosulfonate. The latter is a byproduct of the paper-making industry, which is an inconsistent and impure additive. In recent years, the lead-acid battery industry has been actively investigating the replacement of lignosulfonate with purified forms of natural crystalline flake graphite — a much purer and electrically conductive component. Initial independent test results for Westwater Resources’ ULTRA-PMG™ battery graphite conductivity enhancement product indicate outstanding performance for this substantial market.
Product tradename: ULTRA-DEXDG™

Product Description: Delaminated (sheared) expanded graphite for battery-cathode conductivity enhancement.

Battery markets/applications:
- Li-ion battery cathodes
- Primary-lithium battery cathodes
- Alkaline battery cathodes

Product tradename: ULTRA-DEXDG™

DEXDG is a form of processed natural crystalline-flake graphite with improved electrical conductivity in electrode matrices for Li-ion, primary-lithium and alkaline battery cells. Additionally, DEXDG is preferable to conventional air-milled flake and/or premium-quality synthetic graphite when higher conductivity is desired, such as applications with high discharge rates.

Due to its superior performance in batteries as a conductivity-enhancement additive, DEXDG is preferred over competing grades of flake and costlier and environmentally harsh synthetic graphite currently being used for these applications.

DEXDG is used as a conductivity-enhancement additive in Li-ion, primary-lithium, and conventional alkaline batteries.

By design, DEXDG particles are not spherical. Instead, they are sheet-like, twisted and torn up, with multiple breaks on the surface. The more breaks, the more contact points, and the higher the resultant in-matrix conductivity. It is customary to not assemble a battery for the initial assessment of performance of graphite conductivity-enhancement additives. Rather, graphite is blended with a targeted active material and confined under unidirectional load into a cylindrical pellet, whose electrical resistivity is determined by a four-point method and is measured with a milliohm meter or a Kelvin bridge. 4T sensing is also known as Kelvin sensing.

Conductivity-Enhancement Graphite Markets

By unit quantities, alkaline batteries account for 80% of manufactured batteries in the United States and for over 10 billion individual units produced worldwide (Roskill, 2017). The global market for specialty conductivity-enhancement graphite is estimated at approximately 18,000 tonnes and is forecast to grow considerably as battery
manufacturers — regardless of the battery chemistry — look to improve battery performance (Benchmark Mineral Intelligence, 2018).

**Market Size (2025):** 30,000 tonnes

*Source: Benchmark Mineral Intelligence, 2018*

Commercially available benchmark reference product: Imerys’ Graphite and Carbon TIMREX BNC30 expanded graphite (synthetic)

**Selling price:** USD$20.50 per kg (USD$19.50 per kg by the pallet; 1,500kg)

*USD$20,500 per tonne (USD$19,500 per tonne, 1.5 tonne minimum)*

*Source: Imerys’ sales representative (shipped from Terrebonne, Québec)*

**Planned Selling Price:** USD$18 to $37 per kg

*USD$18,000 to $37,000 per tonne*

**Production Process Description**

**Concentrate Feedstock** (95 to 98 wt.% Cg)

Higher-purity feedstock graphite is desired. The purity of the feedstock has direct impact on the lifecycle of the furnace’s crucible lining.

**Purification** via Nitrogen Furnace (≥ 99.95 to 99.98 wt.% Cg)

- *Quality Assurance/Quality Control Acid Intercalation* (HNO₃ + H₂SO₄)
- Washing
- Drying
- Measure and adjust acid concentration and levels
- Waste-water neutralization
- Waste-acid neutralization
- *Quality Assurance/Quality Control*

**Expansion Reactor** (Thermal exfoliation)

- *Quality Assurance/Quality Control*

**Delamination Milling** (jet/air milling)

- 2 cyclones and baghouse produces 3 sizes of DEXDG products concurrently (coarse DEXDG in cyclone 1, fine DEXDG in cyclone 2, ultra-fine DEXDG in baghouse)
- *Quality Assurance/Quality Control*

**Dry Classification by size** (separating spheres from non-spheres)

- *Quality Assurance/Quality Control* / Packaging
- *Quality Assurance/Quality Control*
**Warehousing / Shipping**

For price-sensitive customers, Westwater Resources can have a co-processed (co ground or a co-blended) product (e.g. a DEXDG and PMG blend to sell at a lower price than standalone DEXDG). This ensures maintaining price integrity of $18 per kg product. **The three main producers of delaminated graphite conductivity-enhancement products are:**

**Superior Graphite Co.** (USA) *private company*
http://www.superiorgraphite.com
Processes Chinese-sourced graphite concentrate **Imerys**

**Graphite & Carbon** (Switzerland)

Purification utilizes HF
99.5% Cg purity Low purity;
Acid leaching (in Québec, Canada); Inner Mongolia Batou; Brazilain — 2 grades of DEXDG **Nippon**

**Carbon Co., Ltd.** (Japan)

*listed on the Tokyo Stock Exchange, USD$625 million market cap*
http://www.carbon.co.jp/english/
 Processes Chinese-sourced graphite concentrate
99.99% Cg purity (acid leaching) graphite
Product tradename: ULTRA-CSPG™

Product Description: natural, coated spherical purified graphite for use in the manufacture of Li-ion battery anodes

Battery markets/applications:

Li-ion battery anodes

Market Size (2017): 120,000 tonnes (60% natural, 40% synthetic);
Market Size (2020): 400,000 tonnes (70% natural, 30% synthetic)
Market Size (2025): 624,000 tonnes (70% natural, 30% synthetic)

Source: Benchmark Mineral Intelligence, 2018

Selling prices:
USD$7-12 per kg
USD$7,000-12,000 per tonne

Synthetic price:
USD$20 per kg / USD$20,000 per tonne

Source: Benchmark Mineral Intelligence

Planned Selling Price:
USD$10 per kg
USD$10,000 per tonne

Due to environmental and cost concerns, the burgeoning Li-ion battery industry requires a US-based, cost-competitive midstream alternative to current sources of CSPG (mainly acid-purified CSPG, sourced from China).

The world’s future upstream graphite demand is expected to be driven primarily by the expanding downstream demand for Li-ion batteries (for use in electronic devices, transportation and stationery-battery markets). Graphite’s unique properties make it the ideal anode material for Li-ion batteries; however, downstream clients require the performance characteristics of CSPG (finished) graphite — not traditional run-of-mine (unfinished) graphite. Accordingly, upstream graphite exploration and development companies may need the services of a midstream processor to advance the quality of the graphite so that it can later be utilized as the anode in a Li-ion battery. This midstream technological process involves taking natural graphite (an upstream product) and then making a secondary product, by utilizing a process that involves purification, micronization, spheronization, classification, and surface coating, and further optimization of the aforementioned to manufacture a higher-quality and better-
performing product.

3 Targeted Grades of ULTRA-CSPG™ material

- $D_{50} = 25-26 \mu m$ (electric vehicles and grid storage; $D_{50} = 18-20 \mu m$ (hybrid vehicles, electronic devices)
- $D_{50} = 12-15 \mu m$ (US DoD and specialty applications)

Production Process Description

- **Concentrate Feedstock** (90 to 95 wt.% Cg)
- **Purification via Nitrogen Furnace** ($\geq 99.95$ to 99.98 wt.% Cg)
- **Micronization Milling** (jet/air milling or vertical hammer mill)
- **Spheronization** (~ 50 to 75% yield)
- **Wet Classification by size** (separating spheres from non-spheres) • **Drying**
- **Blending** (screening various cuts)
- **Surface Treatment/Carbon Coating** (of the spherical product; non-spheroidal particles are not coated and are captured and converted into Purified Micronized Graphite)
- **De aggregation** (separating agglomerate/satellite particles)
- **Quality Assurance/Quality Control**
- **Packaging**
- **Warehousing/Shipping**
Westwater Resources, Inc.

Business Plan

MARKETING & SALES
MARKETING & SALES

Westwater Resources has developed a marketing strategy with two primary objectives:

1. Obtain a significant share of the current American markets for battery-graphite materials, while maintaining the historic, premium pricing for these products.

2. Expand the markets for these products beyond the current customer base. To achieve these objectives, Westwater Resources is committed to provide its customers with:

   • The highest quality, American-made battery conductivity-enhancement products available on the market (for Li-ion, Primary-Lithium, Lead-Acid, and Alkaline battery market segments);
   • The highest quality, American-made battery-anode graphite products available on the market (for the Li-ion battery market);
   • Reliable and on-time delivery; and
   • Outstanding customer service and support.

We commit to meet and strive to exceed these objectives. By doing so, Westwater Resources should obtain a significant share of the American battery market and maintain this position over the long term.

The following sections will provide an overview of Westwater Resources’ strategic marketing and sales plan for the US and international market. This overview will address the following topics:

MARKETING STRATEGY

As a new battery-graphite manufacturer, Westwater Resources will work strategically to gain a position in the well-established market with many producers. China, Japan and South Korea have been the major producers although they utilize only one provider of American-made battery-graphite.

Westwater Resources should become recognized as a leading source of these very important products in North America and around the world by supplying high-quality, consistently high-performing anode and conductivity-enhancement products, and establishing a system to promptly and reliably deliver these products.

There are three important factors that together play the most critical role in the buyer’s decision to select one battery-graphite product over another:

   • Quality Products. Not only must the product from the supplier meet or exceed the industry’s performance standards and physical/technical specifications, but its quality
must remain consistent. With Westwater Resources’ ability to utilize the latest technology to produce its battery-graphite products, the Company should be able to consistently offer superior-quality products to its customers. The ability to provide premium-quality products will be a particular advantage for Westwater Resources in competing with imported (Chinese-manufactured) products where consistency of product quality and performance is regularly a concern.

- **Reliability.** In today’s highly competitive battery-graphite market, a supplier must be counted on to deliver product when and as promised. This is of critical importance to Westwater Resources as customer service and fulfillment is as vital as producing a superior product. In addition, the supplier must be prepared to promptly resolve any potential problems or issues with the customer’s product or delivery if complications should arise. Because Westwater Resources is committed to providing its customers with the best possible service, part of that commitment will be to be promptly and effectively handle any and all potential problems pertaining to quality or delivery.

- **Be Competitive.** The supplier must be competitive, not just in terms of price, but also in all aspects that matter to a customer. As a new supplier of battery-graphite products, Westwater Resources will offer its products at prices that are competitive in the market, but also be very aware of each customer’s unique requirements and will diligently work with customers to address their specific needs. Westwater Resources’ goal is to outperform its competitors in servicing its customers and in developing programs to help support its customers.

Because Westwater Resources will be a new supplier, the Company’s strategy is not expecting to gain a major share of a customer’s battery-graphite requirement. Rather, it should be able to obtain a portion of each customer’s requirement, with the objective of proving its superior product quality and demonstrating Westwater Resources’ ability to consistently perform.

**This approach to the market will serve two purposes:**

- By taking a low-key approach to penetrating the battery-materials market, there will be less chance of Westwater Resources causing an undue response on the part of its competitors, with the possibility of negatively impacting prices.

- Because it will take Westwater Resources 18 to 24 months to build full production to design capacity, a gradual entry into the market should avoid the possibility of sales commitments getting ahead of production capability.

Once a customer develops confidence that Westwater Resources’ products and services are better than traditional sources of supply, Westwater Resources should be in position to capture a share of a customer’s requirement for battery-graphite products.
MARKETING PLAN

Since 2015, we have held discussions with battery manufacturers (including automobile manufacturers and US DoD contractors and manufacturers) for the purposes of evaluating the Company’s battery-graphite products, with the goal of executing multi-year supply agreements. To date, Westwater Resources has executed more than 30 NDAs with potential customers and has conveyed more than 24 evaluation samples to battery manufacturers and potential end users. Additionally:

- Since 2015, Westwater Resources has attended and exhibited at the following battery industry conferences to engage with potential end users and to build corporate profile:
  - The International Battery Seminar & Exhibit
  - AABC Europe: Advanced Automotive Battery Conference
  - AABC North America: Advanced Automotive Battery Conference
  - The Battery Show Exhibition & Conference
  - NAATBatt International Annual Conference
  - Benchmark Mineral Intelligence World Tour
- In 2016 Westwater Resources joined an important battery industry association — NAATBatt International — for the purpose of building profile and further credibility within the battery industry.
- In 2017 and 2018 Westwater Resources traveled to China to meet with various graphite miners and battery-materials producers, in order to observe first-hand Chinese standards and operational practices in the graphite industry, as well as to gain intelligence about the evolving Chinese graphite market.
- Westwater Resources is expected to officially enter the market for battery-graphite products in Q3 2020.
- Westwater Resources intends to execute definitive, binding sales contracts for supply agreements in 2021 for delivery commencing in 2022.
MANAGEMENT & TECHNICAL TEAM
MANAGEMENT & TECHNICAL TEAM

The Westwater Resources management team and board has many decades of experience in the mineral, energy and manufacturing sectors. Key members of the team are listed below.

MANAGEMENT TEAM

Christopher M. Jones  
President and Chief Executive Officer, Director

Christopher Jones joined Westwater Resources as President and Chief Executive Officer in April 2013. Mr. Jones has more than 30 years of experience in positions of increasing responsibility in senior management as CEO and in operational leadership roles in the mining and energy industries. He was most recently President and CEO of Wildcat Silver Corporation, where his team effectively doubled the size of the resource twice using proven metallurgical technologies. Prior to that, he was the COO and the Mining General Manger at Albian Sands Energy, where he led the post start-up, stabilization, and optimization of the Muskeg River Mine in Alberta. Mr. Jones also held management positions at RAG Coal West Inc., Phelps Dodge Sierrita Corp. and Cyprus Amax Coal Company. He is a member of the American Institute of Mining, Metallurgical, and Petroleum Engineers and is a Professional Engineer registered in Utah and Alberta. Mr. Jones received a Bachelor of Science in Mining Engineering at the South Dakota School of Mines and a Master of Business Administration from Colorado State University.

Jeffrey L. Vigil  
Vice President — Chief Financial Officer

Jeffrey Vigil was appointed Vice President — Chief Financial Officer in June 2013. He is responsible for the Company’s financial and management reporting, tax planning and compliance, treasury and risk management functions, and financings. Mr. Vigil has more than 30 years of financial management experience in both production stage and development stage enterprises, including more than ten years in the uranium sector. Previously, he served in various financial positions, including as CFO at Energy Fuels. Mr. Vigil also has experience in M&A activities, including conducting financial, operational and legal due diligence for acquisitions. Prior to Energy Fuels, he served as CFO for Koala Corporation, which was a durable goods manufacturer publicly listed on NASDAQ. Mr. Vigil’s early uranium sector experience includes serving as a mill cost analyst and contract administrator for the White Mesa uranium processing facility. Mr. Vigil is a graduate of the
University of Wyoming with a Bachelor of Science in Accounting and is a licensed Certified Public Accountant in the State of Colorado.

**Dain A. McCoig**  
**Vice President — Operations**

Dain McCoig, now Vice President of Operations, joined the Company in 2004. He has served in various positions of increasing responsibility including Plant Engineer and Kingsville Dome Plant Superintendent. Mr. McCoig earned a Bachelor of Science in Mechanical Engineering from Colorado School of Mines and is certified as a Professional Engineer from the Texas Board of Professional Engineers.

**Dean T. (Ted) Wilton**  
**Chief Geologist**

Ted Wilton has more than 45 years of experience as a geologist in the minerals industry, having served as an exploration and production geologist for a variety of mineral commodities ranging from gold, potash, sulphur to uranium. He has held technical and senior management positions within the Freeport-McMoRan group of companies, Minorco and Kinross Gold organizations, amongst others, and has worked in a variety of geographic locations, including the western United States (including Alaska), Latin America, Russian Far East, Yukon Territory, Australia and several of the island nations of the southwest Pacific region.

He is a graduate of the New Mexico Institute of Mining & Technology and the 2011 recipient of the university’s Distinguished Alumni Achievement Award. Mr. Wilton was a former member of the Nevada State Commission on Multiple Use of Public Lands, and a former member of the US Bureau of Land Management’s Northwest Great Basin Resource Advisor Council.

**Cevat Er**  
**Vice President — Technical Services**

Cevat Er has been serving in Turkey as the Country Manager for Westwater Resources since 2015. He has been in various aspects of mining business for more than 30 years. He contributed in geochemistry and hydrogeology to the development of numerous projects in US, South and Central America, Europe and Turkey when he worked for SRK Consulting Group for 15 years, including the start-up of SRK’s Turkish office. Mr. Er was General Manager Caldag Nickel Corporation for 7 years. At Caldag Nickel, he developed atmospheric leaching and SX-EW technologies for the nickel and cobalt processing. Mr. Er holds a Bachelor of Science degree in Geological Engineering from the Middle East
Technical University in Turkey and a Master of Science degree in Geochemistry and Hydrogeology from the University of Arizona.

**John W. Lawrence**  
*General Counsel and Corporate Secretary*

John Lawrence joined Westwater Resources as General Counsel in October 2012 and was appointed Corporate Secretary in May 2013. Mr. Lawrence has more than 35 years of experience in legal, licensing and regulatory affairs in the energy, environmental and natural resource industries. Mr. Lawrence has advised public and private corporations as well as state and local governmental entities on a wide variety of business and legal matters. He has served as General Counsel for two other corporations, and he was previously associated with several major law firms providing corporate advice and counsel. Mr. Lawrence is a graduate of Purdue University with a Bachelor of Science in Nuclear Engineering and obtained his juris doctorate from the Columbus School of Law at Catholic University. He is licensed to practice law in Maryland, the District of Columbia and New Mexico.

**WESTWATER RESOURCES, INC. BOARD OF DIRECTORS:**

**Terence J. Cryan**  
*Chairman of the Board*

Terence Cryan is the Chairman of the Board of Directors of Westwater Resources, and the Chairman of its Nominating and Corporate Governance Committee, with over 30 years of international business experience based in both the United States and Europe. He also currently serves as Chairman of the Board of Ocean Power Technologies Corporation. Previously Mr. Cryan has served on a number of boards or as president for other publicly traded corporations.

Earlier in his career, Mr. Cryan served as Managing Director and global head of the Energy & Natural Resources Industry Group and member of the Investment Banking Operating Committee at Paine Webber. He joined Paine Webber following its acquisition of Kidder, Peabody in 1994. Mr. Cryan holds a Bachelor of Arts degree in Economics from Tufts University and a Master of Science degree in Economics from The London School of Economics. Mr. Cryan has also served as an adjunct professor at the Metropolitan College of New York Graduate School of Business.

In January 2015, Mr. Cryan was named a National Association of Corporate Directors Board Leadership Fellow, one of the highest levels of credentialing for corporate directors and corporate governance professionals.
Marvin K. Kaiser
Director

Marvin Kaiser has served as a Director on the Board of Directors of Westwater Resources since July 12, 2007. He is Chairman of the Audit Committee. Mr. Kaiser previously worked with The Doe Run Company, a privately held natural resources company and the largest integrated lead producer in the Western Hemisphere, where he served as Executive Vice President and Chief Administrative Officer. Prior to his thirteen years with Doe Run, Mr. Kaiser held the positions of Chief Financial Officer for Amax Gold, Olympic Mining Corporation and Ranchers Exploration at various times over a 24-year period. Mr. Kaiser graduated from Southern Illinois University and is a Certified Public Accountant.

Tracy D. Pagliara
Director

Tracy Pagliara is a member of the Board of Directors for Westwater Resources, and currently serves as President and CEO of Williams Industrial Services Group Inc., a publicly traded provider of engineered products and services to the power, energy and process industries. Prior to joining Williams Industrial Services Group in April 2010, Mr. Pagliara served as the Chief Legal Officer of Gardner Denver, Inc., a leading global manufacturer of highly engineered compressors, blowers, pumps and other fluid transfer equipment. He also had responsibility for other roles during his tenure with Gardner Denver, including Vice President of Administration, Chief Compliance Officer, and Corporate Secretary. Prior to joining Gardner Denver, Mr. Pagliara held positions of increasing responsibility in the legal departments of Verizon Communications/GTE Corporation and Kellwood, ultimately serving in the role of Assistant General Counsel for each company. Mr. Pagliara has a Bachelor of Science in Accounting and a Juris Doctor from the University of Illinois. He is a member of the Missouri and Illinois State Bars and a Certified Public Accountant.

Karli S. Anderson
Director

Karli Anderson has over 15 years of experience in finance and capital markets in the mining industry. In addition to her board service with Westwater, she currently is a General Partner of Carteggi Holdings and a Board Member of the Women's Mining Coalition. She previously served as Vice President, Investor Relations for Royal Gold, Inc., a precious metals stream and royalty company engaged in the acquisition and management of precious metal streams, royalties, and similar production-based interests with over 190 properties on six continents. Previously, Karli was a Senior Director of Investor Relations for Newmont Mining Corporation, one of the world's largest gold producers, and Director of Investor Relations at Coeur Mining, a major
silver and gold producer. Karli has an MBA in finance from the Wharton School at the University of Pennsylvania and she is an NACD governance fellow.
OPERATIONS

Operation Implementation Schedule

Westwater Resources’ business objective is to accelerate the commercial-scale production of ultra-pure battery-graphite products for various end users in the battery and conductivity-enhancement markets.

The schedule of activities and milestones are listed in the following table:

Pilot Scale Operations

Westwater Resources expects to operate a pilot-scale demonstration plant (Pilot Plant) that purifies graphite which will then be further processed into advanced specialty products used in the manufacture of high-capacity rechargeable (secondary) and non-rechargeable (primary) batteries.

The operation of the Pilot Plant is expected to provide the following data:

- Verify the process of purifying graphite concentrates to a minimum purity of 99.95% Cg from purchased externally sourced concentrate products, and for concentrates prepared from materials from the Company’s Coosa County, Alabama graphite deposit;
- Establish operational parameters for the full-sized facility design;
- Provide sufficient data to design and construct a commercial-scale purification plant and emission control devices;
• Produce representative ultra-high purity specialty graphite products such as ULTRA-PMG™, ULTRA-DEXDG™ and ULTRA-CSPG™ that should be available to potential customers for testing purposes, and

• Compile data to be utilized for health, safety and environmental-control measures.

During Pilot operations Westwater Resources will utilize graphite concentrates obtained through its existing supply contract, as well as concentrate from the company’s Coosa graphite deposit.

**Commercial-Scale Operations**

During 2022, Westwater Resources is scheduled to start the operation of the purification plant, with an initial annual capacity of 5,000 tonnes, and subsequently increasing the plant capacity to 15,000 tonnes of product per annum during 2026 as the market matures. Initially, the purification plant is expected to utilize the graphite-concentrate feedstocks purchased from selected vendors to make ultra-pure graphite products. Once mining of graphite from the Coosa deposit commences in 2028, the mill is expected to start operation utilizing the concentrate ultimately originating from the Coosa mine.

**Purification Plant**

Graphite ore from the primary-processing stage will contain impurities that are trapped in the graphite matrix. Secondary processing will be required to remove those impurities. Once these residual contaminants have been removed, the resulting purified graphite should be suitable for the manufacture of high-value conductivity-enhancement and anode products including PMG, DEXDG and CSPG.

The coarse flakes of purified graphite (+50 mesh or +300 µm) produced from the purification process are used to manufacture DEXDG. The DEXDG manufacturing process involves intercalation, expansion and delamination processes. Intercalation of graphite is the process of introducing sulfate and nitrate molecules between the individual layers of graphite flakes. This is accomplished by washing the purified graphite flakes with a solution of nitric and sulfuric acids. After washing and drying the intercalated graphite flakes, they are expanded in a furnace. The expanded graphite flakes are then delaminated via a jet-milling process. Delaminated graphite flakes are then dry-classified through screening for different sizes of products. Each size is packaged separately for different end users.
Basic Flowchart for the Graphite Purification Process:

The fine fraction (-50 mesh or -300 µm) of graphite from the purification step will be directed to the micronization unit to reduce the average particle size to some value within the 10 to 25 µm size range. This will be achieved using jet milling, where the graphite flakes are drawn into streams of high-velocity gases that cause the flakes to collide with each other and to break apart, reducing their size to the target value. The process is controlled by altering the duration, gas pressure and velocity in the system, and the mass of flake material processed at any given time. Once jet milling is complete the resulting graphitic powder is then classified into precise particle-size-based fractions of the overall material. PMG product obtained by milling is supplied to some end-users. Some of the PMG is utilized for producing CSPG.

Spheronization (also known as spheroidization) is the process of converting the graphite particles into rounded, “potato-like” (spheroidal) shapes. The closer the particles are to being spherical in shape, the greater the performance of the anode in the battery. Westwater Resources will utilize a proprietary spheronizing process that causes the graphite particles to “smooth” each other through collisions that eventually result in the desired spheroidal shape. Sharp edges present in the original flakes are broken off and are redeposited onto the surface of the spheroids. The subsequent yield of the process, is approximately ≥50%. The rejected pieces of graphite, will also be recovered and converted to PMG product.

Coating of spheronized particles is done to improve the safety of battery operation and to increase the life of the battery. Westwater Resources will use a proprietary method for applying a 10-nanometer (nm) carbon-based coating on each of the particles, which is subsequently cured to polymerize the coating at the surface. The coating provides continuous coverage of each particle to reduce the surface area, while at the same time allowing Li ions in the electrolyte to pass through small pores or channels, to contact the surface of the graphite particles in the anode. The coating process is the final step in the production of the CSPG material, and the graphite is then ready to be used in the production of anodes for testing.
Coosa Graphite Deposit

Westwater Resources’ Coosa graphite deposit is located at the southern end of the Appalachian mountain range, in Coosa County, Alabama. The deposit area is approximately 52 miles (83 kilometers) south-southeast of the city of Birmingham, and 23 miles (37 kilometers) south-southwest of the town of Sylacauga.

The project mineral tenure is comprised of approximately 41,965 acres (16,982 hectares) of privately-owned mineral rights that the Company holds under a long-term lease. The Coosa graphite deposit is hosted in high-grade metamorphic rocks. Graphitic material is present in two types of schist, a quartz-graphite schist (QGS) that generally has grades greater than (>1% Cg and a quartz-biotite-graphite-schist (QMBGS) that has grades generally less than (<1% Cg.

The uppermost 60-100 feet (20-30 meters) of the graphite-bearing rocks have been weathered and oxidized such that they could be easily mined by simple excavation equipment without any blasting. As currently defined, mining will mainly be centered on these weathered units.

Mining Methods

The Coosa graphite deposit will be mined by conventional small-scale open-pit mining methods through several shallow pits (less than 100 feet deep each) that will be developed over life of the project. At full-scale production the mining rate will be 590,000 short tons per annum, at an average grade of 3.2% Cg. Mine operations will employ small conventional loading and haulage equipment, including a 6.0 cubic yard excavator and 45-ton articulated haul trucks. Mineralized material will be ripped with a bulldozer to prepare the mineralized material for mining with the excavator. Additional support to the mine and plant will be provided by graders and smaller dozers to maintain access roads, stockpiles and overburden storage areas.

Coosa Graphite Deposit Mineral Resources

The mineral resource estimate for Coosa project, as set forth in a Preliminary Economic Assessment (PEA) completed for the company in 2015, demonstrated an Indicated Mineral Resource of 78.4 million short tons averaging 2.39% Cg and an Inferred Mineral Resource of 79.4 million short tons averaging 2.56% Cg. The Indicated and Inferred Mineral Resources presented in the table below are reported at a graphitic carbon cutoff grade of 1% Cg, and the resource estimates are based on assay data from 109 drill holes, totaling 25,905 feet (7,896 meters), and assays from 9 trenches totaling 3,800 feet (1,258 meters) in length. Assay data from the trenches were treated as drill-hole data for mineral-resource estimation purposes.
A recent vanadium discovery, which appears to be coincident with the graphite, has potential to increase the value of this resource. A sampling program was initiated in December 2018, and Four-hundred-forty-one of the 1,923 samples collected for geochemical analysis returned vanadium grades greater than 0.15 percent V2O5 (3 pounds of V2O5 per short ton). Several of the assays exceeded 0.40% V2O5 (8 pounds of V2O5 per short ton). Individual sample intervals ranged from 1.52 feet to 5.0 feet in length each. Numerous continuously mineralized zones (at grades of 0.15% V2O5 or more) have apparent thicknesses in drill holes ranging from 2 feet to 72 feet and apparent widths in trenches ranging up to 50 feet. Limited QEMSCAN and EDX analysis by Actlabs in Ontario, Canada indicated that the vanadium occurs in several mineral phases including roscelite, low V biotite and low V Fe-hydroxides. Roscoelite is recognized visually in the field by the presence of some bright green minerals and has been a historical source of vanadium from mines in western Colorado and eastern Utah, as well as other localities from the early 1900s to the early 1980s.

These analytical results demonstrate the wide-spread distribution of vanadium mineralization throughout the central portion of the Company’s mineral holdings within the Coosa Project. Key target areas displaying strong and continuous vanadium mineralization include the PEA graphite resource area, known as the Grid deposit area, the eastern margin of the Grid deposit area, the northeastern extension of the Grid deposit, and a parallel belt of favorable quartz-graphite schist (QGS) and quartz-muscovite-biotite graphite schist (QMBGS) that includes the former Fixico graphite mine, the Roscoe Ridge prospect and the Holy Schist target. Data indicates that zones of strong vanadium mineralization are clearly accompanied by strong graphite mineralization.

The wide-spread distribution of highly anomalous vanadium mineralization, commonly in association with strong graphite mineralization, points to the need for comprehensive follow-up drilling and trenching to more fully define the ultimate distribution and intensity (grade) of the graphite and vanadium resources of the Coosa Project. Planning is underway for additional core drilling and surface trenching of individual target areas and extensions of known mineralized zones. Additionally, Westwater will initiate a program to evaluate and assess various processing options to economically recover vanadium as a byproduct to graphite.
Coosa Graphite Project Mineral Resource Estimate

**Resource**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Tonnage (short tons)</th>
<th>Graphitic Carbon (%)</th>
<th>Contained Graphite (short tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated</td>
<td>78,488,000</td>
<td>2.39</td>
<td>1,876,000</td>
</tr>
<tr>
<td>Inferred</td>
<td>79,433,000</td>
<td>2.56</td>
<td>2,034,000</td>
</tr>
</tbody>
</table>

**Concentrate Plant**

Ore from the Coosa mine is projected to have an average grade of 3.2% Cg, and will contain impurities consisting of quartz, muscovite, iron oxides and calcite. Most of the impurities are present on the surfaces of the graphite flakes and can be easily removed during the flotation process. Processing design maximizes the removal of these impurities while avoiding degradation of graphite flakes.

The concentration plant will consist of two-stage crushing, rod and ball-mill grinding, and multi-stage flotation units. The plant will operate 24 hours per day, 7 days per week, 52 weeks per year. The concentrator operating availability will be 93%. The concentrator plant capacity has been planned to handle approximately 590,000 short tons of ore to produce 16,500 tonnes per annum of final concentrated product with minimum 95% Cg and a 90% graphite recovery rate. The flotation concentrate will be transported to a purification plant for secondary processing and cleaning to produce the ultra-pure final products.

**Quality Management System**

Westwater will be producing specialty graphite products that involves several complex processing steps. The operation of the mineral-processing phase will require many processes and procedures that must be performed properly and consistently. Westwater will be developing a Quality Management System (QMS) that will meet with the standards of ISO 9001:2015 requirements. The QMS program will have written procedures and controls and will provide the framework for producing and delivering the highest purity products possible, through well-documented paper trails, careful management of all operations and internal and external audits. Quality-control measures will be implemented to carefully manage each process stream. Analytical and optical methods will be utilized to certify the product quality.

Westwater’s battery applications are developed as “green technologies”. These technologies must value the health and safety of people and must be protective of environment. Green energy applications should consider the full cycle of the materials that are utilized by the technology. Graphite and other materials used in Li-ion batteries, for example, must be mined, processed and cleaned in such a way that environmental impacts are minimized. Westwater is committed to manufacturing ultra-pure graphite products with a sustainable environmental footprint, and minimizing the impact of their
activities to the environment to levels acceptable to all stakeholders including its customers. Westwater will be certified for ISO 14001 and would seek continuous improvements on water use, waste management, emissions and discharges.

Government and Community Relations

The location of the Coosa project provides several advantages to the project’s feasibility. The Coosa mine will be located on private land; permitting for the project will rest primarily at the State level (with limited levels of Federal permitting), which should provide a relatively straightforward process when compared to mining projects on land administered by the Federal government. There is significant local and state-level support for the Coosa project, given the number of potential jobs that would be created from it. The proximity to the Sylacauga marble mine suggests that there are significant numbers of skilled workers in the area. Labor costs are favorable in Alabama. Stakeholders were identified and communicated with during the course of the project. Among some of the stakeholders are:

• **Alabama Department of Commerce**: The Alabama Department of Commerce is focused on economic and workforce development within the State. They may be able to help offer tax incentives for the project, Additionally, they are promoting the Westwater Resources story to potential industry partners in the State and others that are considering locating to Alabama, including both Chinese and Korean battery manufacturers;

• **Alabama Power Company**: The Alabama Power Company is a utility company that provides electrical power to 1.4 million customers in the southern two-thirds of Alabama. It is one of four U.S. utilities operated by the Southern Company, one of the nation’s largest generators of electricity. Alabama Power can assist Westwater by offering competitive prices on electricity, free/discounted electric utility infrastructure, electrical engineering services, and even potential direct investment into the company;

• **Coosa County Commission**: The Coosa County Commission is the governing body for Coosa County, Alabama. Westwater Resources has received support from the Coosa County Commission since our Company’s inception and received a signed Resolution from all of the members of the Coosa County Commission in November 2017 to illustrate their commitment to helping make Westwater Resources’ Coosa Project a success;

• **Lake Martin Economic Development Alliance (LMEDA)**: The Lake Martin Economic Development Alliance is a two-county (Tallapoosa and Coosa) economic development group that works to attract new business and industry to the Lake Martin area and also to retain existing business and industry. The LMEDA informed Westwater Resources that they will be able offer Alabama work force development programs to assist in job
training, potential tax incentives and abatements that Westwater could qualify for during project construction and once in production, and potential site locations for Westwater Resources’ advanced manufacturing graphite plant in Coosa County, Alabama. LMEDA also manages a 327-acre industrial park in Coosa County which could be offered to Westwater at a discounted rate;

• **Manufacture Alabama Trade Association**: Manufacture Alabama is the only trade association in the state dedicated exclusively to developing and maintaining the competitive, legislative, regulatory and operational interests and needs of manufacturers and their partner industries and businesses in the State. Manufacture Alabama has assured Westwater Resources that they can assist with political support and any potential challenges that might arise from the permitting process, community relations, opposition from environmental/conservation groups, etc. Westwater Resources has been a member of Manufacture Alabama since 2013
TERMS AND DEFINITIONS
## TERMS AND DEFINITIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>4T Sensing</td>
<td>Four-terminal testing, a standard test in the battery industry for measuring the electrical resistivity of electrode materials. Also referred to as Kelvin sensing</td>
</tr>
<tr>
<td>Alkaline battery</td>
<td>Typically, primary battery with Zn metal anode and Mn dioxide cathode, with a KOH-based alkaline electrolyte</td>
</tr>
<tr>
<td>Anode</td>
<td>Negative electrode during discharge; positive electrode during charge</td>
</tr>
<tr>
<td>Battery</td>
<td>An assembly of cells</td>
</tr>
<tr>
<td>CAGR</td>
<td>Compound Annual Growth Rate</td>
</tr>
<tr>
<td>Carbon black</td>
<td>Manufactured organic compound containing carbon, typically produced from petroleum products</td>
</tr>
<tr>
<td>Cathode</td>
<td>Positive electrode during discharge; negative electrode during charge</td>
</tr>
<tr>
<td>Cell</td>
<td>Electrochemical unit containing electrodes, separator and electrolyte</td>
</tr>
<tr>
<td>Cg</td>
<td>Carbon as graphite (i.e. the portion of carbon in a sample that is graphitic in nature)</td>
</tr>
<tr>
<td>Charge / Charging</td>
<td>Putting electrical energy into a battery</td>
</tr>
<tr>
<td>Charge carrier</td>
<td>In battery systems, an atom or molecule with a positive electrical charge (i.e. an ion) or an electron (which carries a negative electrical charge)</td>
</tr>
<tr>
<td>Classification</td>
<td>Sorting of processed graphite particles by size and shape</td>
</tr>
<tr>
<td>Coated Spherical Purified Graphite</td>
<td>A value-added graphite material for use in Li-ion battery anodes, produced by applying a surface-coating unit operation to Spherical Purified Graphite</td>
</tr>
<tr>
<td>Conductivity enhancement additive</td>
<td>Material typically added to cathode material to increase the conductivity of that electrode</td>
</tr>
<tr>
<td>CSPG</td>
<td>Coated Spherical Purified Graphite</td>
</tr>
<tr>
<td>D&lt;sub&gt;50&lt;/sub&gt;</td>
<td>The median diameter of a sample of particles, i.e. the diameter at which half the sample consists of particles larger than the D&lt;sub&gt;50&lt;/sub&gt; value, and half consists of particles smaller than this value</td>
</tr>
<tr>
<td>DCA</td>
<td>Dynamic Charge Acceptance</td>
</tr>
<tr>
<td>Delaminated Expanded Graphite</td>
<td>A value-added graphite material, produced by applying intercalation, expansion and delamination unit operations to Purified Graphite</td>
</tr>
<tr>
<td>Delamination</td>
<td>Splitting and shearing of graphite previously subject to expansion</td>
</tr>
<tr>
<td>DEXDG</td>
<td>Delaminated Expanded Graphite</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Discharge</td>
<td>Drawing electrical energy from a battery through use</td>
</tr>
<tr>
<td>DoD</td>
<td>United States Department of Defense</td>
</tr>
<tr>
<td>Dynamic Charge Acceptance</td>
<td>A measurement of the ability of a cell or battery to absorb the input of electrical charge, in relation to the cell or battery's capacity to accept that charge</td>
</tr>
<tr>
<td>Electrode</td>
<td>Electrical conductor in contact with the electrolyte in a cell</td>
</tr>
<tr>
<td>Electrolyte</td>
<td>Transport medium through which positive charge carriers migrate from one electrode to the other</td>
</tr>
<tr>
<td>Expander</td>
<td>Additive to negative plate of lead-acid battery to increase surface area and to stabilize the physical structure</td>
</tr>
<tr>
<td>Expansion</td>
<td>Physical expansion of intercalated Purified Graphite using thermal processes</td>
</tr>
<tr>
<td>Flake-graphite concentrate</td>
<td>An intermediate precursor product, the result of applying primary processes to natural flake graphite</td>
</tr>
<tr>
<td>Graphite</td>
<td>A semi-metallic form of the element carbon, with a hexagonal crystalline structure</td>
</tr>
<tr>
<td>H₂SO₄</td>
<td>Sulfuric acid</td>
</tr>
<tr>
<td>HCl</td>
<td>Hydrochloric acid</td>
</tr>
<tr>
<td>HF</td>
<td>Hydrofluoric acid</td>
</tr>
<tr>
<td>HNO₃</td>
<td>Nitric acid</td>
</tr>
<tr>
<td>Intercalated Intercalation</td>
<td>Infusion of HNO₃ and H₂SO₄ between the individual layers of Purified Graphite materials as a precursor to expansion</td>
</tr>
<tr>
<td>Ion</td>
<td>Electrically charged atoms or molecules</td>
</tr>
<tr>
<td>KOH</td>
<td>Potassium hydroxide</td>
</tr>
<tr>
<td>Lead-acid battery</td>
<td>Secondary battery utilizing Pb and Pb oxide electrodes and a H₂SO₄-based acidic electrolyte</td>
</tr>
<tr>
<td>Li</td>
<td>The metallic element lithium</td>
</tr>
<tr>
<td>Li-Ion battery</td>
<td>Secondary battery utilizing Li ions as charge carriers</td>
</tr>
<tr>
<td>Micronization</td>
<td>Particle-size reduction to a (typically) narrow size range (typically with a D₅₀ of 10 to 25 µm)</td>
</tr>
<tr>
<td>Mn</td>
<td>The metallic element manganese</td>
</tr>
<tr>
<td>Natural flake graphite</td>
<td>Naturally occurring form of graphite with plate-like structures</td>
</tr>
<tr>
<td><strong>Negative plate</strong></td>
<td>Anode in a lead-acid battery</td>
</tr>
<tr>
<td><strong>Pb</strong></td>
<td>The metallic element lead</td>
</tr>
<tr>
<td><strong>PMG</strong></td>
<td>Purified Micronized Graphite</td>
</tr>
<tr>
<td><strong>Positive plate</strong></td>
<td>Cathode in a lead-acid battery</td>
</tr>
<tr>
<td><strong>Primary battery</strong></td>
<td>Single-use, non-rechargeable battery</td>
</tr>
<tr>
<td><strong>Primary process(es)</strong></td>
<td>Unit operations required to transform mined natural flake graphite into flake-graphite concentrate, typically including standard mineral-processing steps such as grinding, attrition and flotation</td>
</tr>
<tr>
<td><strong>Primary-lithium battery</strong></td>
<td>Primary battery utilizing an anode of Li metal</td>
</tr>
<tr>
<td><strong>Purification</strong></td>
<td>Removal of impurities from flake-graphite concentrate</td>
</tr>
<tr>
<td><strong>Purified Graphite</strong></td>
<td>An intermediate graphite material, produced by applying a purification unit operation to flake graphite concentrate</td>
</tr>
<tr>
<td><strong>Purified Micronized Graphite</strong></td>
<td>A value-added graphite material, produced by applying purification and micronization unit operations to flake-graphite concentrate</td>
</tr>
<tr>
<td><strong>QA/QC</strong></td>
<td>Quality Assurance and Quality Control. Process designed to monitor and correct product quality.</td>
</tr>
<tr>
<td><strong>Secondary battery</strong></td>
<td>Rechargeable battery that can be used multiple times</td>
</tr>
<tr>
<td><strong>Secondary process(es)</strong></td>
<td>Unit operations required to transform flake-graphite concentrate into value-added products such as Purified Graphite and derivative products</td>
</tr>
<tr>
<td><strong>Separator</strong></td>
<td>Insulating permeable layer between the two electrodes to prevent short circuits and premature discharge</td>
</tr>
<tr>
<td><strong>Si</strong></td>
<td>The semi-metallic element silicon</td>
</tr>
<tr>
<td><strong>Si-CSPG</strong></td>
<td>A value-added graphite material for use in Li-ion battery anodes, produced by introducing small quantities of silicon (Si) into Coated Spherical Purified Graphite</td>
</tr>
<tr>
<td><strong>SPG</strong></td>
<td>Spherical Purified Graphite</td>
</tr>
<tr>
<td><strong>Spherical Graphite</strong></td>
<td>Purified</td>
</tr>
<tr>
<td><strong>Sphonization</strong></td>
<td>Process for converting graphite particles into rounded, potato-like spheroids</td>
</tr>
<tr>
<td><strong>Stationary battery</strong></td>
<td>Battery used for fixed-position applications, such as grid storage</td>
</tr>
<tr>
<td><strong>Synthetic graphite</strong></td>
<td>Manufactured graphite, typically derived from the processing of coal tar pitch and petroleum coke</td>
</tr>
<tr>
<td><strong>Zn</strong></td>
<td>The metallic element zinc</td>
</tr>
</tbody>
</table>
### Units:

<table>
<thead>
<tr>
<th>Mesh</th>
<th>Micron (µm)</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1700</td>
<td>0.0661</td>
</tr>
<tr>
<td>50</td>
<td>300</td>
<td>0.0117</td>
</tr>
<tr>
<td>200</td>
<td>75</td>
<td>0.0029</td>
</tr>
<tr>
<td>500</td>
<td>25</td>
<td>0.0010</td>
</tr>
</tbody>
</table>

*micron or micrometer (µm) = one millionth of a meter (m) or 0.000001m nanometer (nm) = one billionth of a meter (m) or 0.000000001m (The diameter of a human hair is ~ 70 microns and a single grain of table salt is ~ 100 microns)*
REFERENCES


Benchmark Mineral Intelligence, internal communication with Alabama Graphite Corporation, 2016.


AMERICAN-MADE BATTERY-GRAPHITE PRODUCTS