UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2019
or

☐ **TRANSITION REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

Commission file number: 001-37515

Aqua Metals, Inc.
(Exact name of registrant as specified in its charter)

Delaware	**47-1169572**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification Number)

2500 Peru Dr.
McCarran, Nevada 89437
(Address of principal executive offices)

(775) 525-1936
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act

Title of each class of stock:	Trading symbol	Name of each exchange on which registered:
Common Stock	**AQMS**	**The Nasdaq Capital Market**

Securities registered pursuant to Section 12(g) of the Act:
None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Exchange Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the past 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company (as defined in Rule 12b-2 of the Act):

Large accelerated filer	☐	Accelerated filer	☒
Non-accelerated filer	☐	Smaller reporting company	☒
		Emerging Growth Company	☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act)
Yes ☐ No ☒

State the aggregate market value of voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold, or the average bid and asked price of such common equity, as of the last business day of the registrant's most recently completed second fiscal quarter: $83,247,290.

The number of shares of the registrant's common stock outstanding as of March 10, 2020 was 59,767,720.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement for the registrant's 2020 Annual Meeting of Stockholders to be filed pursuant to Regulation 14A within 120 days of the registrant's year ended December 31, 2019 are incorporated herein by reference into Part III of this Annual Report on Form 10-K.

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CAUTIONARY NOTICE

This annual report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Those forward-looking statements include our expectations, beliefs, intentions and strategies regarding the future. Such forward-looking statements relate to, among other things,

- our ability to collect insurance proceeds in amounts sufficient to fund our capital requirements;
- our intentions, expectations and beliefs regarding anticipated growth, market penetration and trends in our business;
- the ability to maximize selling value from the broken lead-acid batteries, or LABs;
- the timing and success of our plan of commercialization;
- our ability to operate our AquaRefining process on a commercial scale;
- our ability to realize the expected benefits of our strategic partnership with Clarios;
- our ability to procure LABs in sufficient quantities at competitive prices;
- the effects of the putative class action and shareholder derivative lawsuits filed against us;
- the effects of market conditions on our stock price and operating results;
- our ability to maintain our competitive technological advantages against competitors in our industry;
- our ability to have our technology solutions gain market acceptance;
- our ability to maintain, protect and enhance our intellectual property;
- the effects of increased competition in our market and our ability to compete effectively;
- costs associated with defending intellectual property infringement and other claims;
- our expectations concerning our relationships with suppliers, partners and other third parties; and
- our ability to comply with evolving legal standards and regulations, particularly concerning requirements for being a public company and environmental regulations.

These and other factors that may affect our financial results are discussed more fully in “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” included in this report. Market data used throughout this report is based on published third party reports or the good faith estimates of management, which estimates are presumably based upon their review of internal surveys, independent industry publications and other publicly available information. Although we believe that such sources are reliable, we do not guarantee the accuracy or completeness of this information, and we have not independently verified such information. We caution readers not to place undue reliance on any forward-looking statements. We do not undertake, and specifically disclaim any obligation, to update or revise such statements to reflect new circumstances or unanticipated events as they occur, and we urge readers to review and consider disclosures we make in this and other reports that discuss factors germane to our business. See in particular our reports on Forms 10-K, 10-Q, and 8-K subsequently filed from time to time with the Securities and Exchange Commission.

PART I

Item 1. Business

Background

We were formed as a Delaware corporation on June 20, 2014 for the purpose of engaging in the business of recycling lead through a novel, proprietary and patent-pending process that we developed and named “AquaRefining”. Since our formation, we have focused our efforts on the development and testing of our AquaRefining process, the development of our business plan, the raise of our present working capital and the development of our initial lead acid battery, or LAB, recycling facility in the Tahoe Reno Industrial Center, McCarran, Nevada (“TRIC”).

We completed the development of our first LAB recycling facility at TRIC and commenced production of battery breaking and limited operations during the first quarter of 2017. The TRIC facility was designed to produce varying products for commercial sales primarily consisting of ingoted AquaRefined lead, ingoted lead bullion, lead compounds, and plastics. In April 2017, we commenced the shipment of products for sale, consisting of metallic lead, lead compounds and plastics. In April 2018, we commenced the limited production of cast lead bullion, representing a mixture of lead purchased to prime our kettles and AquaRefined lead from our AquaRefining process. In June 2018, we commenced the sale of pure AquaRefined lead in the form of two tonne blocks, and in October 2018, we commenced the sale of AquaRefined lead in the form of battery manufacturing ready ingots. In November 2018, we received official vendor certification from Clarios for our AquaRefined lead and in December 2018, we commenced shipments directly to Clarios owned and partnered battery manufacturing facilities.

During the second and third quarters of 2019 we operated up to four modules from time to time (modules 1 through 4) on a 24x7 basis. Throughout these quarters, we made significant progress related to our goals of ramping up the recycling facility at TRIC to full production. Some of the milestones reached were related to production and revenue records while at the same time reducing general and administrative expense.

During the fourth quarter of 2019, the Company focused its efforts on completing the Phase 2 capital upgrades, including work done to commission the remaining 12 modules. On whole, completion of the Phase 2 capital work was expected to improve the plant's contribution margin. These projects included concentrate production improvements, electrolyte chilling improvements, improvements in briquetting our spongy AquaRefined lead to prepare for melting and ingot casting, water recovery and management systems, upgrades to all the AquaRefining modules and finally, the paste drying system to increase our yields and throughput.

On the evening of November 29, 2019, a fire occurred in the AquaRefining area of the recycling facility at TRIC. The fire and related intense heat and smoke caused significant damage to a material amount of equipment in the AquaRefinery area, including all 16 AquaRefining modules, electrical and tank infrastructure, steel superstructure, control wiring and other supporting infrastructure. The floor to ceiling firewall between the AquaRefining area and the rest of the plant isolated the worst of the damage to the AquaRefining area. The firewall also appears to have spared material damage to much of the key front-end process equipment, such as the battery breaker/separation system, concentrate production area, kettles and ingot casting, water treatment and recovery and other important areas of the plant. The administrative office area also remained intact and is now occupied by the remaining employees.

Based on preliminary estimates, as of the date of this report, we believe that the replacement value of the AquaRefining equipment and portions of the plant lost or damaged in the fire is approximately $37 million excluding any business interruption cost recovery. Assets on our balance sheet as of December 31, 2019 that were not affected by the fire total approximately $38 million, including the battery breaker, melting kettles, kiln, filter presses, mixing and storage tanks, water recovery system and the building infrastructure plus the land. The Company has $50 million dollars in combined property, equipment and business interruption insurance. Initial estimates for property, plant and business interruption claims may reach total limits. However, this number could change pending detailed analysis and review. We expect that our insurers will continue to make payments under our policies with the initial $15 to $20 million of payments under our policies coming in over the next three to six months.

The Company has engaged a public adjuster in business for over 50 years who is supporting the Company’s legal and finance team and providing forensic accounting, construction expertise and direct interface with the insurers to assist the Company in quickly and properly documenting the loss and seeking to maximize the speed and amount of the Company’s insurance recovery.

As a result of the fire we have suspended all commercial operations and the date on which we can resume revenue producing operations is currently undetermined. Following the fire, an investigation of the fire was commenced by the Storey County Fire Marshal and we were denied access to the fire damaged portion of the facility until late December 2019, at which time we were given access to the fire damaged area. As of the date of this report, the insurance carriers paid an initial amount of $10.0 million on account of damages suffered as a result of the fire.

As of the date of this report, we are developing and analyzing a proposed capital light business strategy designed to optimize shareholder value that focuses on licensing opportunities, which have always been a core part of our business plans. We believe this path has the potential to maximize shareholder value in that it could be far less capital intensive than a rebuild and could be funded solely or primarily from a combination of cash on hand, insurance proceeds and asset dispositions. The capital light strategy is consistent with our long-held business strategy and objectives. The approach of this strategy is to pursue licensing opportunities within the lead battery recycling marketplace while securing our cash position by first, working on the successful collection of insurance proceeds with the assistance of our retained public adjuster and special counsel to facilitate the collection for property and business interruption losses; second, conducting the disposal of certain assets not essential to the capital light licensing strategy; and, third, restructuring the remaining balance on the USDA-backed loan with Green Bank that was initially set up to provide capital for a running facility and would be impractical with a shift to capital light technology licensing business. The go forward capital light business strategy would require less space and less equipment and focus on the needs of our future licensees. We are working on demonstrating improved electrolyzers that would be specified for future licensees.

Unless otherwise indicated, the terms "Aqua Metals", "Company", "we," "us," and "our" refer to Aqua Metals, Inc. and its wholly-owned subsidiaries.

All references in this report to "ton" or "tonne" refer to a metric ton, which is equal to approximately 2,204.6 pounds.

Since our organization in 2014, we have engaged in several capital raising transactions, the most recent of which are summarized below in "Management's Discussion and Analysis of Financial Condition and Results of Operations - General."

Overview

Aqua Metals is seeking to reinvent lead recycling with its patented and patent pending AquaRefining™ technology. Unlike smelting, AquaRefining is a room temperature, water-based process. Lead is a globally traded commodity with a worldwide market value in excess of $20 billion. Lead acid batteries (LABs) are the primary consumer use of all lead produced in the world. Because the chemical and metallurgical properties of lead allow it to be recycled and reused indefinitely, LABs are also the dominant feed source for lead production across the world. As such, LABs are almost 100% recycled for purposes of capturing the lead contained therein for re-use. We believe that our proprietary and patented AquaRefining process will provide for the existing LAB recycling facility to leverage our capabilities for expanded production of a much higher purity lead with fewer environmental and regulatory issues than is possible with the current conventional methods of lead production.

In recent years, recycled lead has become increasingly important to LAB production. Recycled lead surpassed mined lead in the 1990s and now represents more than 60% of the lead content in new LABs. Whether it is produced from lead ore or recycled LABs, lead has historically been produced by smelting. Smelting is a high-temperature, metallurgical/chemical reduction, energy intensive and often a highly polluting process. As a consequence of the environmental and health issues, lead smelting has become increasingly regulated in many countries. In the U.S., regulatory non-compliance has forced the closure of large lead smelters in Vernon, California, Frisco, Texas and Herculaneum, Missouri over the last several years. In response to increasing environmental regulation over the past three decades, there has been an expansion of LAB smelting capacity in Mexico and other less regulated countries. The resulting transportation of used LABs from where they originate in the U.S. to smelters in Mexico, South Korea, the Philippines and elsewhere is an increasingly significant logistical and global environmental cost.

AquaRefining uses a bio-degradable aqueous solvent and a novel ambient temperature electro-chemical process to produce lead suitable for use in LAB production. Our AquaRefining process produces lead with a purity of 99.996+%, making it the purest lead ever made from a recycling technique that is in fact more pure than lead made from mining processes. We believe that AquaRefining can provide a more efficient production process as compared with alternative methods of producing equivalent grades of lead. For example, licensing the technology to facilities closest to the source of used LABs is more efficient due to minimization of transport costs and supply chain bottlenecks. On this basis, we believe that AquaRefining reduces environmental plant emissions, health concerns and permitting needs compared with lead smelting. We believe that the combined advantages offered by AquaRefining represent a potential step change in lead recycling technology that includes improved product quality, advantages in footprint and logistics as well as reduced environmental impact.

The modular nature of AquaRefining makes it possible both to start LAB recycling at a smaller scale than is possible with a typical smelter setup and to add AquaRefining to existing battery recycling operations to expand production capacity or to reduce smelting processes. Our plan is to pursue the licensing of our AquaRefining technology. This strategy is designed to supply AquaRefining and supporting equipment to battery recyclers to improve emissions, throughput and product quality from their battery recycling operations.

Our Markets

The Lead Market

Lead is a globally traded metal commodity and is the essential component of over 80% of the world's rechargeable batteries. Lead is globally traded primarily on the London Metals Exchange (LME), although the smaller Shanghai Metals Exchange (SHME) in China also trades the element. Conventionally in the industry, there are two separate groupings of lead: i) primary lead which refers to lead produced at primary smelters that use mined lead concentrates (generally lead sulfide) as their major feedstock, and ii) secondary lead which refers to lead smelters utilizing LABs as their main feed source.

Originally, the majority of the lead used in batteries was sourced from primary smelters but in recent decades, secondary lead has grown to become the dominate product used. Industry data shows that six million metric tons of lead was produced in 1995, of which approximately 45% was from primary and 55% was from secondary sources. Twenty years later, by 2015, global lead production had increased to approximately 11 million metric tons, of which more than 65% was secondary. Importantly, primary lead production had increased only marginally during this period. This marginal increase is partially due to lead-zinc mine deposits being depleted across the globe in existing mines. As such, an increasing quantity of primary lead is now the predominate byproduct of zinc mining.

In 2005, secondary lead traded on the LME in a range of $1,000 to $1,200 per metric ton. During 2019, secondary lead traded in a range of approximately $1,785 to $2,270 per metric ton.

As noted above, although lead is traded as a commodity on the LME/SHME, the major sales are directly between producers/ traders and users (whom are typically battery manufacturers). The LME daily price is used as the benchmark in forming the basis of physical trades, forward contracts and hedge strategies for both primary and secondary lead. Based on market and product knowledge with buyers of lead in the U.S. and Global lead markets, different grades (termed alloys) of lead are traded at a premium to the base LME price. Lead alloys, which are generally specifically designed for the customer, are also sold at a premium above the base LME, whereas byproducts (generally lead compounds or scrap) are traded at a discount to the LME as they are based on the lead content and its form.

Lead Smelting

Currently, smelters produce virtually all the world's mined and recycled lead. Smelting is an energy-intensive and, in some poorly managed plants, a highly polluting process. At its core, smelting is a relatively high temperature (excess of 900°C) metallurgical reduction process in which lead compounds are heated and reacted with various reducing agents to remove the oxygen, sulfur, and other impurities. The process leaves behind bullion lead and waste slag. In smelting, depending upon the operation, 0.5% to 5% of the lead can be lost to the "slag", with the resultant lead bullion containing both wanted and unwanted impurities.

In developed countries, there is both increased environmental regulation and enforcement of such, including monitoring of permissible blood lead levels in employees and local populations. These regulations and the increasing enforcement have made it more expensive to operate smelters. According to a report titled "Hazardous Trade?" produced by the Secretariat of the Commission for Environmental Cooperation in 2013, this has led to a decline of lead smelters in the U.S., an expansion of smelting operations in Mexico and a resultant increase in the export of used LABs from the U.S. followed by the re-import of recycled lead. This trade is believed to be largely driven by the lower costs related to the less stringent environmental standards and enforcement in Mexico. For the foregoing reasons, we believe that lead smelting facilities are increasingly located in less regulated areas remote from both the source of used LABs and the demand for lead. We believe that the remote location of smelting increases the transport costs to the production of recycled lead.

Lead Acid Batteries

Although the LAB is one of the earliest battery technologies, in terms of energy capacity deployed and installed manufacturing capacity, it still dominates the battery industry today. Historically, the largest market for LABs has been as starter batteries for vehicles. However, with the increasing electrical load on modern vehicles and the adoption of "Stop-Start" conventional 12V "starter batteries", LABs are evolving into more capable and higher value products. At the same time, large new markets such as Cell Tower, Data Center and Industrial back-up are adding to demand. Consequently, existing LAB production facilities are being expanded and new facilities are being built.

According to Grand View Research, annual lead acid battery sales are expected to nearly double to $84 billion by 2025, driving demand for lead. Similar prospects for healthy growth in the lead industry continue to be published and support continued growth in demand for lead for at least the next 20 years. We believe that grid storage and other energy storage applications linked to renewable energy (solar and wind) will also generate increased demand for LABs, where low cost, safety and reliability will make them attractive options.

The increase in LAB manufacturing in general and particularly in China, India and Southeast Asia, has increased demand for lead, putting pressure on global recycling networks to meet this demand. At present, we believe that much of the LAB recycling performed outside of the U.S., Canada, the EU, Japan, and Australia is carried out in outdated facilities with poor environmental standards and insufficient enforcement. China, India, Pakistan and South America appear to be moving toward tougher regulation and enforcement. We believe that this will drive a demand in foreign markets for more less polluting LAB recycling processes.

AquaRefining Process

We developed AquaRefining to be a cleaner and modular alternative to smelting. Our process has two key elements, both of which are integral to our issued patents and pending-patent applications. The first is our use of a proprietary, non-toxic solvent that dissolves lead compounds. The second is a proprietary electro-chemical process and electrolyzer that converts the dissolved lead compounds into high purity lead suitable for use in LAB production.

Similar to conventional LAB smelter recycling, our AquaRefining process begins with the crushing of used LABs and the separation of the metallic lead, active material (lead compounds), sulfuric acid and plastic for recycling. The active material (lead compounds) are first processed to remove sulfur and then dissolved in our solvent. Lead is then plated from the solvent using our patented and patent-pending process allowing the solvent to be reused.

Our AquaRefining process can generate the following outputs:

- Lead and lead-based products, including high purity lead, lead alloys and lead compounds which are primarily intended for the LAB industry. We are also exploring higher value lead-based products which may offer performance and life-cycle benefits to the LAB industry; and
- Recovered plastic chips, intended for re-use in the manufacture of battery casings and other recycled plastic products.

A significant benefit of our AquaRefining process is that it is capable of producing higher purity product than that derived from primary smelters with product from secondary sources. As indicated above, primary grade lead is generally sold directly to battery companies.

Another significant benefit of our process is that we designed our AquaRefining equipment to be manufactured on a purpose-built production line in standard sized modules. This is not possible with the smelting process, as smelters need to be constructed on site. This gives us the ability to provide AquaRefining systems with capacities ranging from four metric tons per day to more than 400 metric tons per day all based on our standard module.

Lead recycling is subject to a variety of domestic and international regulations related to hazardous materials, emissions, employee safety and other matters. While our operations will be subject to these regulations, we believe that one of our potential advantages will be our ability to conduct lead recycling operations with less regulatory cost and burden than smelting operators due to the nature of our process. One of our key objectives will be to educate regulators and the public as to the environmental benefits of AquaRefining. We believe that we have the potential to develop a business model that offers the opportunity to conduct, in an environmentally friendly manner, an important recycling activity that historically has been conducted in an often highly polluting manner.

Our Business Model

Overall, our objective is to progress the lead recycling industry from one which is based solely on smelting to one which is based on AquaRefining supplemented by smelting. The business model that we are currently most focused on is the supply of AquaRefining and supporting equipment and services to third parties to use in their recycling operations on a licensing model with running royalties to Aqua Metals for lead produced. We are currently focused on exploring this business stream through our relationship with Clarios and other existing smelters.

The market for lead is global in scale but local in nature and execution, with large differences in local regulation, custom and practice, and access to transportation and electricity costs. In some regions, it is highly regulated, and in others it is not. Consequently, we are evolving our business model to commercialize our technology optimally across multiple locations.

In the U.S. and similarly regulated countries, our plan is to supply AquaRefining technology to LAB recycling facilities, both directly and in association with third parties through joint ventures, licensing and direct sales. We intend to work with all potential parties that would be interested in our AquaRefining technology. As an example, on February 7, 2017, we entered into a series of agreements with Clarios (formerly Johnson Controls, Inc), pursuant to which, among other things, we agreed to work with Clarios on the development of a program for upgrades of Clarios and certain strategic partners of Clarios' existing lead smelters throughout North and South America, China and Europe to a lead recycling process utilizing our proprietary and patented AquaRefining technology and equipment, know-how and services. In June 2019, we signed an agreement with Clarios setting parameters for finalizing a definitive development program. Those performance conditions, however, were based on the operation of up to 16 AquaRefining modules at TRIC, and our ability to meet these performance conditions is unlikely if the Company pursues a technology licensing business plan without rebuilding TRIC to its pre-fire status as discussed in the "Background" section above. We have initiated discussions with Clarios to revise the performance conditions, however as of the date of this report we have been unable to reach an agreement with Clarios on revised performance standards. If we are unable to agree with Clarios on revised performance standards, we may be unable to sell AquaRefining equipment or license our AquaRefining technology to third-parties until the expiration of the Equipment Supply Agreement in June 2021 or the agreement's earlier termination. However, there can be no assurance that we will be able to conclude a definitive development agreement with Clarios on terms that benefit us, if at all. See "Risk Factors - Risks Related to Our Business."

Competition

At the present time, our primary competition in the production of lead comes from operators of existing smelters and other parties heavily invested in the existing supply chain for smelting. Our approach to this competition is to make AquaRefining available for the conversion of existing smelter-based facilities. However, it is prudent to assume that outside of our strategic relationships, a conversion to AquaRefining may be resisted by some of the incumbent lead producers. Competition in the supply of lead from such incumbents may come in the form of price competition for lead produced. However, to the extent we are successful with partners in being a producer of high-quality lead without the regulatory costs or burden associated with smelting, we believe that we may be able to compete effectively with smelting as the preferred method of recycling lead, at least in the more regulated jurisdictions.

Secondary competition comes from other alternatives to lead smelting that are electrochemical based. There are a few groups that have run lab scale and bench tests but to date, no alternate technology has been commercialized to produce large quantities of consistent quality lead whereas Aqua Metals has already done so.

The First AquaRefining Demonstration Plant: McCarran, Nevada

In May 2015, we purchased 11.73 acres of undeveloped land in the Tahoe Reno Industrial Center (TRIC) at McCarran, Nevada where we subsequently built a 136,750 square foot LAB recycling facility.

The building phase was completed by August 2016, at which time we started installing and commissioning equipment. We installed and commissioned the first production AquaRefining module in October 2016 and produced our first lead ingot using electrolyte we produced on-site using materials supplied by a third party, which were recovered from recycled batteries. We verified that the lead we produced by this method was over 99.99 percent pure.

We commenced initial battery breaking during December 2016 and progressed to regular single shift operation of the battery breaker in January 2017. From late 2016 through the date of this report, we implemented a number of upgrades to the facility, the battery breaking and separation processes and other more conventional aspects of our process.

During 2018, we began continuous production of AquaRefined lead and sold it at a premium to the London Metals Exchange ("LME"). The Company also received from Clarios approved lead supplier status and we started shipping directly to their battery manufacturing facility.

During 2019, our facility operated up to four modules (modules 1 through 4) on a 24x7 basis for select periods of time and we were installing capital upgrades needed to commission the remaining 12 modules. These capital upgrades included concentrate production improvements, electrolyte chilling improvements, improvements in briquetting our spongy AquaRefined lead to prepare for melting and ingot casting, water recovery and management systems, upgrades to all the AquaRefining modules and finally, the paste drying system to increase our yields and throughput.

Our recycling facility at TRIC experienced a fire event on November 29, 2019. The fire severely damaged the AquaRefinery portion of the facility and was limited mostly to the AquaRefining area but affected other areas of the facility. Because of the fire, the plant has been shut down. However, we plan to collect the proceeds from the insurance carriers, and we are currently developing and analyzing a proposed plan to use the funds on an accelerated transition to a capital light, technology and licensing business rather than pursuing a rebuild of TRIC to its pre-fire status. There can be no assurance that we will be able to collect additional insurance proceeds or that such proceeds will be sufficient to cover the costs of damages.

Supply, Off-Take and Other Strategic Agreements

In support of our first facility, we entered into a series of agreements and relationships providing for the supply of LABs and the off-take of the recycled lead we produced. As described in more detail below, Interstate Battery has agreed to supply us with LABs pursuant to a written agreement entered into in May 2016. In addition, we have established an important relationship with Battery Systems, Inc. ("Battery Systems"), an independent LAB distributor with a distribution facility located next to our TRIC facility, for Battery Systems' supply of used LABS to us. We have also entered into an agreement with Clarios pursuant to which Clarios has agreed to purchase from us, recycled lead on both a tolling (fee to convert used LABs to recycled materials) and merchanting (sale of recycled materials) basis. In addition, we were able to further diversify our feedstock supply by obtaining used LABs from various other sources at more favorable pricing. Consequently, we believe that we have access to an ample supply of used LABs and demand for our lead-based products for the foreseeable future.

Clarios Agreements

Equipment Supply Agreement. We entered into an equipment supply agreement dated February 7, 2017 with Johnson Controls Inc. ("Johnson Controls") pursuant to which we agreed to collaborate on the development of a program for the installation of new greenfield builds and conversion of existing Johnson Controls and certain strategic partners of Johnson Controls existing lead smelters to a lead recycling process utilizing our proprietary and patent-pending AquaRefining technology and equipment, know-how and services. We have agreed with Johnson Controls to develop an appropriate program blueprint, and enter into a definitive development program agreement reflecting that blueprint, pursuant to which we will provide to Johnson Controls and certain strategic partners of Johnson Controls, by way of licensing or sale, the following products and services in the regions of North and South America, Europe and China:

- AquaRefining technology and the related equipment, engineering and systems integration support sufficient to convert or retrofit existing smelter-based operations and/or the construction of new Johnson Controls and Johnson Controls' strategic partners' battery recycling facilities based on our AquaRefining technology;
- Training, evaluation and certification of Johnson Controls' operations personnel sufficient for such personnel to competently operate our AquaRefining technology and equipment; and
- Ongoing technical support, maintenance services and warranties.

In May 2019, the assets and operations of Johnson Controls Battery Group, Inc., including our agreements and collaboration with Johnson Controls, were sold to Clarios, a newly organized battery and power solutions company formed by Brookfield Business Partners L.P. In this report, we refer to Clarios as the successor to Johnson Controls Battery Group, Inc., when referring to agreements, actions or discussions between us and Johnson Controls Battery Group, Inc., whether prior to or following the latter's transfer of assets to Clarios.

We plan to provide the above services and equipment to Clarios in conjunction with our partner, Veolia North America Regeneration Services, LLC, on a serviced license basis, including Clarios' ongoing licensing fees payable to us based on the operational capacity of the AquaRefining equipment supplied by us. We have agreed not to license our AquaRefining technology and equipment to third parties in the aforementioned regions until such time as we and Clarios have agreed on certain matters relating to the initial conversion of a Clarios facility. In June 2019, we entered into an agreement with Clarios to amend the equipment supply agreement pursuant to which we have agreed to use good faith, commercial best-efforts to conclude the discussion and negotiation of, and enter into, a development program agreement no later than the 90th day following our satisfaction of certain performance criteria agreed upon by Clarios and us, however those performance conditions were based on the operation of up to 16 AquaRefining modules at TRIC, which now seems unlikely. We have initiated discussions with Clarios to revise the performance conditions, however as of the date of this report we have been unable to reach an agreement with Clarios on revised performance standards. If we are unable to agree with Clarios on revised performance standards, we will be unable to sell AquaRefining equipment or license our AquaRefining technology to third-parties until the expiration of the Equipment Supply Agreement in June 2021 or the agreement's earlier termination. There can be no assurance that we will be able to negotiate and conclude a definitive development program agreement with Clarios on commercially reasonable terms, or at all.

The equipment supply agreement allows each party the right to seek early termination based on a material breach by the other party that goes uncorrected for 30 days following notice of breach. The equipment supply agreement contains representations, warranties and indemnities that are customary to commercial agreements of this nature.

Tolling/Lead Purchase Agreement. We entered into a tolling/lead purchase agreement dated February 7, 2017 with Clarios pursuant to which we have agreed to sell to Clarios, and Clarios has agreed to purchase from us, recycled lead on both a tolling (fee to convert used LABs to recycled materials) and merchanting (sale of recycled materials) basis.

Pursuant to the agreement, Clarios has agreed to purchase from us, and we have agreed to sell to Clarios, up to 100% of the recycled lead we produce for automotive applications, other than by way of tolling arrangements, on a monthly basis, unless we receive notice from Clarios six months advance of its intention to purchase less than 100% of our output in any given month. Our agreement with Clarios excludes, and we are free to manufacture and sell to third parties, recycled lead for non-automotive uses, such as stationery batteries for back-up power systems for Internet/Cloud applications or grid scale storage applications. During fiscal year 2019 and 2018, approximately 69% and 88% of our revenues, respectively, were derived from sales to Clarios.

We have also agreed to provide tolling services to Clarios whereby Clarios will deliver to us used lead acid batteries, or LABs, and we will recycle the used LABs and return the recycled lead to Clarios for a fee. Clarios has agreed to send to us for tolling, and we have agreed to toll for Clarios, used LABs representing a significant allocation of the production capacity of our initial recycling facility in McCarran, Nevada. To date, none of our sales to Clarios have been from tolling.

The tolling/lead purchase agreement has a minimum term of five years and upon the expiration of the initial term of the agreement, either party can terminate the agreement upon three years prior written notice. Either party may elect to terminate the agreement for any reason after the second anniversary of the agreement, which termination shall be effective on the third anniversary of the notice of termination. Either party may terminate the agreement on ten days' prior written notice of breach that goes uncorrected during the notice period. The tolling/lead purchase agreement contains representations, warranties and indemnities that are customary to commercial agreements of this nature.

Veolia Agreement

On February 26, 2019, we entered into an Operations, Maintenance and Management Agreement with Veolia North America Regeneration Services, LLC, or Veolia, pursuant to which Veolia will provide operational, maintenance and managerial services in regard to our AquaRefining facility located at the TRIC. As a result of the November 2019 fire at TRIC, we have suspended all operations at TRIC pending our clean-up of the fire damage and development of our plan with respect to operations. In January 2020, we declared a force majeure under the Veolia Operations, Management and Maintenance Agreement and suspended payments to Veolia thereunder. If we do not rebuild TRIC to its pre-fire status, as discussed above, we expect that our Operations, Management and Maintenance Agreement would expire according to its terms in February 2021. The Operations, Management and Maintenance Agreement with Veolia contemplates entering into good faith negotiations with Veolia for a long-term agreement concerning Veolia's participation in the commercial licensing and management of our future AquaRefining facilities developed by licensees of Aqua Metals. We have agreed with Veolia to use our good faith commercial best-efforts to conclude negotiations for the long-term licensing and future facilities agreement by June 30, 2020. Because of the force majeure and suspension of activity with Veolia there can be no assurance that we will be able to negotiate and conclude definitive long-term agreements with Veolia on commercially reasonable terms, or at all. If we are unable to conclude long-term agreements with Veolia, it is likely that we will lose Veolia as our partner in the commercial licensing and management of our future AquaRefining facilities.

Intellectual Property Rights

We regard the protection of our technologies and intellectual property rights as an important element of our business operations and crucial to our success. We endeavor to generate and protect our intellectual property assets through a series of patents, trademarks, internal and external policy and procedures and contractual provisions.

Patent Portfolio

Currently, we have secured three US patents, 24 international patents, and two allowances (one US and one international). In addition to the US patents, we have international patents/allowances in the European Union, the Eurasian Patent Organization, Honduras, India, Indonesia, South Korea, Japan, China, Australia, Canada, African Intellectual Property Organization, Mexico, South Africa, Vietnam, and the Ukraine. We also have 86 patent applications pending in the United States and numerous corresponding patent applications pending in 20 additional jurisdictions across seven distinct patent applications relating to certain elements of the technology underlying our AquaRefining process and related apparatus and chemical formulations. The claims of the granted patents substantially address the same subject matter and are drawn to various aspects of processing lead materials using an aqua refining process. Differences in the claim number and scope are due to local rules and practice.

We intend to continue to prepare and file domestic and foreign patent applications covering expanding aspects and applications of our technology, as circumstances warrant.

There can be no assurance that any patents will issue from any of our current or any future applications. Also, any patents that may issue may not survive a legal challenge to their scope, validity or enforceability, or provide significant protection for us. Competitors may work around our patents so they are not infringing. Our patent portfolio and our existing policy and procedures safeguarding our trade secrets nonetheless may face challenges so that our competitors can copy our AquaRefining process.

Trademark Portfolio

We have filed for trademark registration in the US and foreign countries for the following trademarks:

- AQUA METALS (US and 15 foreign countries)
- AQUAREFINING (US and 11 foreign countries)
- AQUAREFINE (US only)
- AQMS (US only)
- AQUAFIT (US only)

Trade Secrets and Contract Protection

We have developed our internal policy and procedures in safeguarding our trade secrets and proprietary information. Our procedures generally require our employees, consultants and advisors to enter into confidentiality agreements. These agreements provide that all confidential information developed or made known to the individual during the course of the individual’s relationship with us is to be kept confidential and not disclosed to third parties except under specific circumstances. In the case of our employees, the agreements provide that all of the technology that is conceived by the individual during the course of employment is our exclusive property. The development of our technology and many of our processes are dependent upon the knowledge, experience and skills of key scientific and technical personnel.

Government Regulation

Our operations in the United States will be subject to the federal, state and local environmental, health and safety laws applicable to the reclamation of LABs. While the lead reclamation process itself is generally not subject to federal permitting requirements, depending on how any particular operation is structured, our facilities may have to obtain environmental permits or approvals from federal, state or local regulators to operate, including permits or regulatory approvals related to air emissions, water discharges, waste management, and the storage of LABs on-site should that become necessary. We may face opposition from local residents or public interest groups to the installation and operation of our facilities. Failure to secure (or significant delays in securing) the necessary approvals could prevent us from pursuing some of our planned operations and adversely affect our business, financial results and growth prospects.

In addition to permitting requirements, our operations are subject to environmental health, safety and transportation laws and regulations that govern the management of and exposure to hazardous materials such as the lead and acids involved in LAB reclamation. These include hazard communication and other occupational safety requirements for employees, which may mandate industrial hygiene monitoring of employees for potential exposure to lead. Failure to comply with these requirements could subject our business to significant penalties (civil or criminal) and other sanctions that could adversely affect our business. Changes to these regulatory requirements in the future could also increase our costs, require changes in or cessation of certain activities, and adversely affect the business.

The nature of our operations involves risks, including the potential for exposure to hazardous materials such as lead, that could result in personal injury and property damage claims from third parties, including employees and neighbors, which claims could result in significant costs or other environmental liability. Our operations also pose a risk of releases of hazardous substances, such as lead or acids, into the environment, which can result in liabilities for the removal or remediation of such hazardous substances from the properties at which they have been released, liabilities which can be imposed regardless of fault, and our business could be held liable for the entire cost of cleanup even if we were only partially responsible. Like any manufacturer, we are also subject to the possibility that we may receive notices of potential liability in connection with materials that were sent to third-party recycling, treatment, and/or disposal facilities under the Federal Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (“CERCLA”), and comparable state statutes, which impose liability for investigation and remediation of contamination without regard to fault or the legality of the conduct that contributed to the contamination, and for damages to natural resources. Liability under CERCLA is retroactive, and, under certain circumstances, liability for the entire cost of a cleanup can be imposed on any responsible party.

As our business expands outside of the United States, our operations will be subject to the environmental, health and safety laws of the countries where we do business, including permitting and compliance requirements that address the similar risks as do the laws in the United States, as well as international legal requirements such as those applicable to the transportation of hazardous materials. Depending on the country or region, these laws could be as stringent as those in the US, or they could be less stringent or not as strictly enforced. In some countries in which we are interested in expanding our business, such as Mexico and China, the relevant environmental regulatory and enforcement frameworks are in flux and subject to change. Therefore, while compliance with these requirements will cause our business to incur costs, and failure to comply with these requirements could adversely affect our business, it is difficult to evaluate such potential costs or adverse impacts until such time as we decide to initiate operations in particular countries outside the United States.

Employees

As of the date of this report, we employ 23 people on a full-time basis. None of our employees are represented by a labor union.

Financial and Segment Information

We operate our business as a single segment, as defined by generally accepted accounting principles. Our financial information is included in the consolidated financial statements and the related notes.

Available Information

Our website is located at www.aquametals.com and our investor relations website is located at https://ir.aquametals.com/. Copies of our Annual Report on Form 10-K, Quarterly Report on Form 10-Q, Current Reports on Form 8-K, and amendments to these reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, are available, free of charge, on our investor relations website as soon as reasonably practicable after we file such material electronically with or furnish it to the Securities and Exchange Commission, or the SEC. The SEC also maintains a website that contains our SEC filings. The address of the site is *www.sec.gov*. Further, a copy of this Annual Report on Form 10-K is located at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. Information on the operation of the Public Reference Room can be obtained by calling the SEC at 1-800-SEC-0330. The contents of our website are not intended to be incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC, and any references to our websites are intended to be inactive textual references only.

Item 1A. Risk Factors

Investing in our common stock involves a high degree of risk. Before purchasing our common stock, you should read and consider carefully the following risk factors as well as all other information contained in this report, including our consolidated financial statements and the related notes. Each of these risk factors, either alone or taken together, could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our common stock. There may be additional risks that we do not presently know of or that we currently believe are immaterial, which could also impair our business and financial position. If any of the events described below were to occur, our financial condition, our ability to access capital resources, our results of operations and/or our future growth prospects could be materially and adversely affected and the market price of our common stock could decline. As a result, you could lose some or all of any investment you may make in our common stock.

Risks Relating to the Recent Fire at TRIC

We have experienced a fire at our TRIC facility which has caused significant damage and resulted in the suspension of all revenue producing operations On the evening of November 29, 2019, a fire occurred at our LAB recycling facility at TRIC. The cause of ignition is likely related to on-site contractor work that was being performed on the day of the fire. The fire was substantially contained to the AquaRefining area of the plant, however the fire destroyed or impaired beyond recovery substantially all of the AquaRefining equipment, including all 16 AquaRefining modules, control wiring and other supporting infrastructure. While we continue to assess the economic loss due to the fire, as of the date of this report we estimate that the value of the equipment and plant lost or damaged due to the fire is approximately $37 million excluding any business interruption cost recovery. We maintain insurance policies covering a total of up to $50 million of combined property, equipment and business interruption insurance. As of the date of this report, the insurance carriers have paid a total of $10 million on the covered claims and we expect the carriers to make significant additional payments over the coming months up to the presently estimated value of the equipment and plant lost or damaged due to the fire (approximately $37 million). However, there can be no assurance that we will be able to collect additional insurance proceeds to cover the loss. In the meantime, we have suspended all revenue producing operations pending our clean-up of the fire damage and development of our plan for the overall business. As of the date of this report, we are unable to estimate when we expect to resume any meaningful commercial or revenue producing operations. As of the date of this report, we intend to fund our resumption of commercial operations through our receipt of insurance proceeds, however there can be no assurance that the proceeds will be collected.

While we have $50 million of combined property, equipment and business interruption insurance, there can be no assurance that one or more carriers will not attempt to deny coverage. To date, we have submitted claims to each of our insurance carriers. Each of the insurance carriers have accepted coverage under the polices subject to the customary reservation of rights, but no carrier has to our knowledge indicated that it would deny or attempt to deny coverage. Each of our insurance policies contain customary exclusions from the carriers' obligation to cover claims made under the policies, including exclusions based on certain of our intentional acts or omissions, including our willful failure to maintain an adequate fire suppression system. We had acquired and installed a comprehensive fire suppression at TRIC, however the preliminary investigation by the local fire marshal indicates that the fire suppression system at TRIC failed to activate at the time of the fire. We had, at all times leading up to the fire, engaged a nationally recognized fire detection and prevention service company to service and maintain our fire suppression system. The service provider had serviced our fire suppression system as recent as November 12, 2019. As of the date of this report, we have not determined the reason for the failure of our fire suppression system to activate at the time of the fire. However, we have no reason to believe that the failure to activate is due to any action or failure to act on our part that would justify a carrier to exclude payment on our insurance claim. However, there can be no assurance that a carrier may not deny coverage based on its claim that we failed to maintain a fire suppression system as required by the policy or for some other exclusion under the policy. In the event that one or more carriers deny coverage under their policies, we may be unable to finance our recovery and resume commercial operations, in which case you could lose your investment.

Our ability to utilize insurance payments is subject to our credit facility with our secured lender. As of the date of this report, we are indebted to Green Bank for approximately $9.2 million ($8.6 million net of issuance costs), which is secured by liens on substantially all of our assets, including the proceeds of any payments made on our insurance claims. Pursuant to the credit agreement governing such indebtedness, Green Bank is the loss payee on our insured claims and all funds are paid directly to Green Bank, which in turn disburses the proceeds to us based on our submission of a use of funds. To date, Green Bank has disbursed to us funds requested by us, however there can be no assurance that Green Bank will not deny future disbursements. In the event that Green Bank denies future disbursements, we may be required to allocate approximately $10 million of insurance payments towards the repayment of the Green Bank loan, which payment would include a $0.5 million prepayment penalty.

As a result of the fire, we are revising our plans for the commercialization of our AquaRefining technologies and there can be no assurance that such plans will be successful. When we designed and developed TRIC, we did so at a time when our business model assumed that TRIC would be the first of many LAB recycling facilities owned and operated by us. Commencing in 2017, we began to shift our focus away from the development of additional Company-owned LAB recycling facilities and towards the licensing of our AquaRefining technology to partners engaged in LAB recycling. We continued to develop TRIC as a LAB recycling facility for purposes of demonstrating AquaRefining on a commercial scale. However, as a result of the fire and our high costs of capital we believe that the cost of restoring TRIC to its pre-fire state would not be the best use of our available cash and that we may be able to achieve the benefits of operating 16 AquaRefining modules, namely the demonstration of the scalability of our AquaRefining technologies, through a less costly commercialization program. As of the date of this report, we plan to focus on licensing opportunities within the $20+ billion lead battery recycling marketplace. We believe this path is far less capital intensive than a rebuild of TRIC to its pre-fire state and we believe this plan could be funded solely or primarily from cash on hand plus ongoing insurance proceeds and asset disposition of the AquaRefinery. However, there can be no assurance that our revised business model will be successful or that we will acquire insurance proceeds sufficient to fund our revised business plan.

Risks Relating to Our Business

Since we have a limited operating history and have only recently commenced revenue producing operations, it is difficult for potential investors to evaluate our business. We formed our corporation in June 2014 and only commenced revenue producing operations in the first quarter of 2017. From inception through December 31, 2019, we generated a total of $11.4 million of revenue, all of which was derived primarily from the sale of lead compounds and plastics and, to a lesser extent, the sale of lead bullion and Aqua Refined lead. To date, our operations have primarily consisted of the development and testing and limited operations of our AquaRefining process, the construction of our initial LAB recycling facility at TRIC, the continuing development of our LAB recycling operations at TRIC and limited revenue producing operations as we brought those LAB recycling operations online. As a result of the November 2019 fire at TRIC, we have suspended all plant based revenue producing operations pending our clean-up of the fire damage and development of our plan for resuming operations. As of the date of this report, we are unable to estimate when we expect to resume any meaningful commercial or revenue producing operations. Our limited operating history makes it difficult for potential investors to evaluate our technology or prospective operations. As an early stage company, we are subject to all the risks inherent in the initial organization, financing, expenditures, complications and delays in a new business, including, without limitation:

- the timing and success of our plan of commercialization and the fact that we have suspended operations at TRIC;
- our ability to demonstrate that our AquaRefining technology can be operated on a commercial scale;
- our ability to profitably operate our AquaRefining process on a commercial scale; and
- our ability to realize the expected benefits of our strategic partnerships with Clarios and Veolia.

Investors should evaluate an investment in us in light of the uncertainties encountered by developing companies in a competitive environment. There can be no assurance that our efforts will be successful or that we will ultimately be able to attain profitability.

Our business is dependent upon our successful implementation of novel technologies and processes and there can be no assurance that we will be able to implement such technologies and processes in a manner that supports the successful commercial roll-out of our business model. While much of the technology and processes involved in our lead recycling operations are widely used and proven, the AquaRefining component of our lead recycling operations is largely novel with limited modest scale operations. While we have shown that our proprietary technology can produce AquaRefined lead on a small scale, we have just begun to demonstrate that we can produce AquaRefined lead on a commercial scale. Further, as we endeavored to complete our AquaRefining production line, we continuously encountered unforeseen complications that delayed the ramping up of our AquaRefining modules and the integration of our AquaRefining process with the traditional lead recycling operations. There can be no assurance that we will not encounter similar unforeseen complications as we pursue our revised business model.

We will need additional financing to execute our business plan and fund operations, which additional financing may not be available on reasonable terms or at all. As of December 31, 2019, we had total cash of $7.6 million and working capital of $17.7 million, which includes $17.4 million of insurance proceeds receivable, of which we had received $7.5 million of insurance proceeds following year-end. As of the date of this report, we believe that we may require additional capital in order to fund our current level of ongoing costs and our proposed business plan over the next 12 months as we move forward with our capital light licensing strategy. We intend to acquire the necessary capital though the recovery of insurance proceeds on our fire related claims and the possible sale of certain equipment and assets at TRIC. However, there can be no assurance that we will be able to collect insurance proceeds or acquire proceeds from the sale of TRIC in amounts sufficient to fund the capital requirements or, if we are successful, that we will not require additional capital. If needed, we may seek funding through the sale of equity or debt financing. Funding that includes the sale of our equity may be dilutive. If such funding is not available on satisfactory terms, we may be unable to further pursue our business plan and we may be unable to continue operations, in which case you may lose your entire investment.

We are currently under agreement with Veolia for the operations of TRIC, however there can be no assurance that we will continue to partner with Veolia. In February 2019, we entered into an Operations, Management and Maintenance Agreement with Veolia North America Regeneration Services, LLC, or Veolia. Pursuant to the Agreement, Veolia agreed to provide development of operations programs, start-up of new equipment and operations, maintenance and management services at our AquaRefining facility at TRIC. As a result of the November 2019 fire at TRIC, we have suspended all operations at TRIC pending our clean-up of the fire damage and development of our plan for resuming operations. In January 2020, we declared a force majeure under the Veolia Operations, Management and Maintenance Agreement and suspended payments to Veolia thereunder. If we follow through with our plans not to restore TRIC, we would expect that our Operations, Management and Maintenance Agreement would expire according to its terms in February 2021. The Operations, Management and Maintenance Agreement with Veolia contemplates entering into good faith negotiations with Veolia for a long-term agreement concerning Veolia's participation in the commercial licensing and management of our future AquaRefining facilities developed by licensees of Aqua Metals. We have agreed with Veolia to use our good faith commercial best-efforts to conclude negotiations for the long-term licensing and future facilities agreement by June 30, 2020. Because of the force majeure and suspension of activity with Veolia there can be no assurance that we will be able to negotiate and conclude definitive long-term agreements with Veolia on commercially reasonable terms, or at all. If we are unable to conclude long-term agreements with Veolia, it is likely that we will lose Veolia as our partner in the commercial licensing and management of our future AquaRefining facilities.

We are subject to restrictive debt covenants that may limit our ability to run our business, finance our capital needs and pursue business opportunities and activities. As of the date of this report, we are indebted to Green Bank for approximately $9.2 million ($8.6 million net of issuance costs), which is secured by liens on substantially all of our assets including insurance proceeds. The credit agreement governing such indebtedness contains covenants that limit our ability to take certain actions. These covenants could limit our ability to finance our future operations and capital needs and our ability to pursue business opportunities and activities that may be in our interest. If we breach any of these covenants, the debt holder could declare a default under the credit agreement, in which case all of the indebtedness may then become immediately due and payable. If the debt under the credit agreement is accelerated, we may not have, or be able to obtain, sufficient funds to make these accelerated payments. In addition, since all of the indebtedness to Green Bank is secured by substantially all of our assets, a default under the credit facility could enable the debt holder to foreclose on its security interest and attempt to seize our assets. The affirmative and negative debt covenants could materially adversely impact our ability to operate and finance our business. In addition, our default under any of these covenants could subject us to accelerated debt payments or foreclosure proceedings that could threaten our ability to continue as a going concern.

Additionally, we were not in compliance with the minimum debt service coverage ratio covenant on our loan from Green Bank as of the fiscal quarter ends between March 31, 2017, and December 31, 2019. We received a waiver for the minimum debt service coverage ratio covenant for those periods. While we expect to continue to receive waivers from Green Bank for non-compliance with such covenant, there is no guarantee that we will receive such waivers. If Green Bank determines not to grant us a waiver for non-compliance in the future, we would be in default of the loan and Green Bank would be able to accelerate the payment of all amounts under the loan.

In the event of the acceleration of the Green Bank loan, we will need additional financing to satisfy our obligations under the loan, which additional financing may not be available on reasonable terms or at all. As noted above, as of the date of this report, we are indebted to Green Bank for approximately $9.2 million ($8.6 million net of issuance costs). The credit agreement governing such indebtedness contain various affirmative and negative covenants and if we breach any of these covenants, the debt holder could declare a default under the credit agreement, in which case all of the indebtedness may then become immediately due and payable. If the debt under the credit agreement is accelerated, we may not have sufficient funds to make the accelerated payments, in which case we would be required to seek additional funds through various financing sources, most likely through the sale of our equity or debt securities. However, there can be no assurance that such funds will be available on commercially reasonable terms, if at all. Further, any sale of our equity or equity-linked securities will result in additional dilution to our stockholders.

Our outstanding debt may make it difficult for us obtain additional financing using our future operating cash flow.We currently owe approximately $9.2 million to Green Bank as of the date of this report. Such indebtedness could limit our ability to borrow additional funds to fund operations or expansion or increase the cost of any such borrowing, or both. Our inability to conduct additional debt financing could:

- limit our flexibility in developing our business operations and planning for, or reacting to, changes in our business;
- increase our vulnerability to, and reduce our flexibility to respond to, general adverse economic and industry conditions; and
- place us at a competitive disadvantage as compared to our competitors that are not as highly leveraged.

Any of these or other consequences or events could have a material adverse effect on our ability to finance our business and our operations.

Our business model is new and has not been proven by us or anyone else We are engaged in the business of producing recycled lead through a novel, and proven on a modest scale, technology. While the production of recycled lead is an established business, to date all recycled lead has been produced by way of traditional smelting processes. To our knowledge, no one has successfully produced recycled lead in commercial quantities other than by way of smelting. In addition, neither we nor anyone else has ever successfully built a production line that commercially recycles LABs without smelting. Further, there can be no assurance that either we or our licensees will be able to produce AquaRefined lead in commercial quantities at a cost of production that will provide us and our proposed licensees with an adequate profit margin. The uniqueness of our AquaRefining process presents potential risks associated with the development of a business model that is untried and unproven.

Certain industry participants may have the ability to restrict our access to used LABs and otherwise focus significant competitive pressure on us We believe that our primary competition will come from operators of existing smelters and other parties invested in the existing supply chain for smelting, both of which may resist the change presented by our AquaRefining process. Competition from such incumbents may come in the form of restricted access to used LABs. We believe that LAB manufacturers who also maintain their own smelting operations control a significant part of the market for used LABs. If LAB manufacturers and others involved in the reverse supply chain for used LABs attempt to restrict our access to used LABs, that may adversely affect our prospects and future growth. There can be no assurance that we will be able to effectively withstand the pressures applied by our competition.

Even if we are successful in recycling lead using our processes, there can be no assurance that the AquaRefined lead will meet the certification and purity requirements of our potential customers. A key component of our business plan is to produce recycled lead through our AquaRefining process of the highest purity (at least 99.99% pure lead), which we refer to as AquaRefined lead. We believe that our AquaRefined lead will provide us with a revenue premium over the market price of lead on the London Metal Exchange, or LME, and, more importantly, our ability to produce AquaRefined lead will be vital to confirming the efficacy and relevancy of our proprietary technology. Our customers will require that our AquaRefined lead meet certain minimum purity standards and, in all likelihood, require independent assays to confirm the lead's purity. As of the date of this report, we have produced limited quantities of AquaRefined lead and in November 2018, Clarios confirmed its approval of the purity of our AquaRefined lead by providing to us official vendor approval to receive finished lead at its manufacturing facilities. However, we have not produced AquaRefined lead in significant commercial quantities and there can be no assurance that we will be able to do so or, if we are able to produce AquaRefined lead in significant commercial quantities, that such lead will continue to meet the required purity standards of our customers.

While we have been successful in producing AquaRefined lead in small volumes, there can be no assurance that we will be able to replicate the process, along with all of the expected economic advantages, on a large commercial scale either for us or our prospective licensees. Our commercial operations have primarily involved the production of lead compounds and plastics from recycled LABs, and more recently, the sale of lead bullion and AquaRefined lead. In April 2018, we commenced the limited production of cast lead bullion (mixture of lead purchased to prime the kettles and AquaRefined lead from our AquaRefining process), and in June 2018, we commenced the sale of pure AquaRefined lead in the form of two tonne blocks. While we believe that our development, testing and limited production to date has validated the concept of our AquaRefining process, the limited nature of our operations to date are not sufficient to confirm the economic returns on our production of recycled lead. There can be no assurance that we will be to produce AquaRefined lead in commercial quantities at a cost of production that will provide us and our proposed licensees with an adequate profit margin.

Our business may be negatively affected by labor issues and higher labor costs.Our ability to maintain our workforce depends on our ability to attract and retain new and existing employees. As of the date of this report, none of our employees are covered by collective bargaining agreements and we consider our labor relations to be acceptable. However, we could experience workforce dissatisfaction which could trigger bargaining issues, employment discrimination liability issues as well as wage and benefit consequences, especially during critical operation periods. We could also experience a work stoppage or other disputes which could disrupt our operations and could harm our operating results. In addition, legislation or changes in regulations could result in labor shortages and higher labor costs. There can be no assurance that we may not experience labor issues that negatively impact our operations or results of operations.

Our intellectual property rights may not be adequate to protect our business As of the date of this report, we have secured granted/allowed patents in the following countries/regions: U.S. (9837689, allowed 14/957026), Canada (2930945), China (105981212, 107849634), Europe (3072180), Eurasia (32371), South Africa (2016-04083, 2017/08455, 2017/04123), South Korea (101739414, 101882932, 101926033), Honduras (80-2019), India (318321), Indonesia (IDP000061176), Japan (6173595, 6592088), Mexico (357027), OAPI (17808, 18736), Ukraine (118037, 119580), Vietnam (allowed 1-2016-02246) and Australia (2014353227, 2015350562, 2017213449).

We also have further patent applications pending in the United States and numerous corresponding patent applications pending in 20 additional jurisdictions relating to certain elements of the technology underlying our AquaRefining process and related apparatus and chemical formulations. However, no assurances can be given that any patent issued, or any patents issued on our current and any future patent applications, will be sufficiently broad to adequately protect our technology. In addition, we cannot assure you that any patents issued now or in the future will not be challenged, invalidated, or circumvented.

Even patents issued to us may not stop a competitor from illegally using our patented processes and materials. In such event, we would incur substantial costs and expenses, including lost time of management in addressing and litigating, if necessary, such matters. Additionally, we rely upon a combination of trade secret laws and nondisclosure agreements with third parties and employees having access to confidential information or receiving unpatented proprietary know-how, trade secrets and technology to protect our proprietary rights and technology. These laws and agreements provide only limited protection. We can give no assurance that these measures will adequately protect us from misappropriation of proprietary information.

Our processes may infringe on the intellectual property rights of others, which could lead to costly disputes or disruptions The applied science industry is characterized by frequent allegations of intellectual property infringement. Though we do not expect to be subject to any of these allegations, any allegation of infringement could be time consuming and expensive to defend or resolve, result in substantial diversion of management resources, cause suspension of operations or force us to enter into royalty, license, or other agreements rather than dispute the merits of such allegation. If patent holders or other holders of intellectual property initiate legal proceedings, we may be forced into protracted and costly litigation. We may not be successful in defending such litigation and may not be able to procure any required royalty or license agreements on acceptable terms or at all.

Our business strategy includes licensing arrangements and entering into joint ventures and strategic alliances, however as of the date of this report we have no such agreements in place and there can be no assurance we will be able to do so. Failure to successfully integrate such licensing arrangements, joint ventures, or strategic alliances into our operations could adversely affect our business. We propose to commercially exploit our AquaRefining process primarily by licensing our technology to third parties and entering into joint ventures and strategic relationships with parties involved in the manufacture and recycling of LABs, including Clarios, among others. Although we are currently seeking to negotiate such an agreement with Clarios as further discussed in the following paragraph, as of the date of this report, we have not entered into any such licensing, joint venture or strategic alliance agreements, apart from our equipment supply agreement with Clarios, and there can be no assurance that we will be able to do so on terms that benefit us, if at all. In addition, licensing programs, joint ventures and strategic alliances may involve significant other risks and uncertainties, insufficient revenue generation to offset liabilities assumed and expenses associated with the transaction, potential additional challenges in protecting our intellectual property, and unidentified issues not discovered in our due diligence process, such as product quality, technology issues and legal contingencies. In addition, we may be unable to effectively integrate any such programs and ventures into our operations. Our operating results could be adversely affected by any problems arising during or from any licenses, joint ventures or strategic alliances.

There can be no assurance that we will be able to negotiate our key agreement with Clarios on commercially reasonable terms, or at allIn February 2017, we entered into a series of agreements with Clarios, including an equipment supply agreement pursuant to which, among other things, we agreed to work with Clarios on the development of a program for the conversion of Clarios and certain strategic partners of Clarios' existing lead smelters throughout North and South America, China and Europe to a lead recycling process utilizing our AquaRefining technology and equipment, know-how and services. The equipment supply agreement discusses the development of the conversion program in general terms and contemplates that the parties will enter into a definitive development program agreement that is based on the general terms set forth in the equipment supply agreement and provides more detailed terms and conditions, including the economic obligations and rights of each party. We have agreed not to license our AquaRefining technology and equipment to third parties in the aforementioned regions until such time as we and Clarios have agreed on certain matters relating to the initial conversion of a Clarios facility. In June 2019, we entered into an agreement with Clarios to amend the equipment supply agreement pursuant to which we have agreed to use good faith, commercial best-efforts to conclude the discussion and negotiation of, and enter into, a development program agreement no later than the 90th day following our satisfaction of certain performance criteria agreed upon by Clarios and us, however those performance conditions were based on the operation of 16 AquaRefining modules at TRIC, which is unlikely. We have initiated discussions with Clarios to revise the performance conditions, however as of the date of this report we have been unable to reach an agreement with Clarios on revised performance standards. If we are unable to agree with Clarios on revised performance standards, we may be unable to sell AquaRefining equipment or license our AquaRefining technology to third-parties until the expiration of the Equipment Supply Agreement in June 2021 or the agreement's earlier termination. There can be no assurance that we will be able to negotiate and conclude a definitive development program agreement with Clarios on commercially reasonable terms, or at all.

The division of Johnson Controls with which we interact was recently sold and there can be no assurance that the new owners of the division will maintain the same level of interest in and commitment to the proposed joint development of our AquaRefining technologies. On May 1, 2019, Johnson Controls International plc announced that it had completed the sale of its battery group assets, formerly held by Johnson Controls Battery Group, Inc., to Brookfield Business Partners L.P. The acquired battery group assets will operate under the name Clarios. Based on our conversations with Johnson Controls, it is our understanding that the agreements and proposed business projects between us and Johnson Controls Battery Group, Inc. (collectively, the "Aqua Metals Collaboration") are now under the control of Clarios, and that certain members of the former management of Johnson Controls Battery Group, Inc. will be employed in similar capacities by Clarios. We have also been advised that Clarios and Brookfield Business Partners L.P. have expressed their interest in continuing the Aqua Metals Collaboration initiated by us and Johnson Controls Battery Group, Inc. Although there can be no assurance that Clarios currently has, and/or will maintain, the same level of interest in our joint collaboration as its predecessor, as Clarios could, for example, no longer have an interest in our technologies or have competing priorities, we currently have no reason to believe that Clarios and Brookfield Business Partners L.P. have lost interest. In addition, the change of control of the battery group may cause disruptions and distractions that adversely affect its ability to further the Aqua Metals Collaboration. For these and other reasons, Johnson Controls' sale of its battery group assets to Brookfield Business Partners L.P. could possibly have a material adverse effect on the Aqua Metals Collaboration.

We are dependent on a limited number of suppliers of certain materials used in our AquaRefining process and our inability to obtain these materials as and when needed could cause a material disruption in our operations. Our AquaRefining process involves a significant number of elements, chemicals, solvents and other materials, in addition to used LABs. There are a limited number of suppliers of certain materials used in our AquaRefining process and, other than our Supply Agreement with Interstate Battery Recycling, LLC, we have no agreements in place for our supply of such materials. Our ability to conduct our AquaRefining process on a commercial scale will depend significantly on obtaining timely and adequate supply of these materials on competitive terms. Our inability to source these materials on a timely and cost-efficient manner could interrupt our operations, significantly limit our revenue sales and increase our costs. This factor could also impair our ability to meet our commitments to supply our customers. Our inability to obtain these materials as and when needed could cause a material disruption in our operations.

We may experience significant fluctuations in raw material prices and the price of our principal product, either of which could have a material adverse effect on our liquidity, growth prospects and results of operations. Used LABs are our primary raw material and we believe that in recent years the cost of used LABs has been volatile at times. In addition, we believe that the cost of used LABs can be seasonal, with prices trending lower in the winter months (as automobile owners increase their purchase of new LABs, thereby putting a greater number of used LABs on the market) and trend higher in the spring (as the purchase of new LABs, and supply of used LABs, decreases). Our principal product, recycled lead, has also experienced price volatility from time to time as well. For example, the market price of lead on the LME during 2019 ranged from approximately $1,785 to $2,270 per tonne. While we intend to pursue supply and tolling arrangements as appropriate to offset any price volatility, the volatile nature of prices for used LABs and recycled lead could have an adverse impact on our liquidity, growth prospects and results of operations.

Global economic conditions could negatively affect our prospects for growth and operating results Our prospects for growth and operating results will be directly affected by the general global economic conditions of the industries in which our suppliers, partners and customer groups operate. We believe that the market price of our principal product, recycled lead, is relatively volatile and reacts to general global economic conditions. Lead prices decreased from $2,139 per tonne on May 5, 2015 to a low of $1,554 per tonne on November 23, 2015 because of fluctuations in the market. A month later, the price per tonne increased back up to approximately $1,900 per tonne at the end of 2019. Our business will be highly dependent on the economic and market conditions in each of the geographic areas in which we operate. These conditions affect our business by reducing the demand for LABs and decreasing the price of lead in times of economic downturn and increasing the price of used LABs in times of increasing demand of LABs and recycled lead. There can be no assurance that global economic conditions will not negatively impact our liquidity, growth prospects and results of operations.

We are subject to the risks of conducting business outside the United States A part of our strategy involves our pursuit of growth opportunities in certain international market locations. We intend to pursue licensing or joint venture arrangements with local partners who will be primarily responsible for the day-to-day operations. Any expansion outside of the US will require significant management attention and financial resources to successfully develop and operate any such facilities, including the sales, supply and support channels, and we cannot assure you that we will be successful or that our expenditures in this effort will not exceed the amount of any resulting revenues. Our international operations expose us to risks and challenges that we would otherwise not face if we conducted our business only in the United States, such as:

- increased cost of enforcing our intellectual property rights;
- diminished ability to protect our intellectual property rights;
- heightened price sensitivities from customers in emerging markets;
- our ability to establish or contract for local manufacturing, support and service functions;
- localization of our LABs and components, including translation into foreign languages and the associated expenses;
- compliance with multiple, conflicting and changing governmental laws and regulations;
- compliance with the Federal Corrupt Practices Act and other anti-corruption laws;
- foreign currency fluctuations;
- laws favoring local competitors;
- weaker legal protections of contract terms, enforcement on collection of receivables and intellectual property rights and mechanisms for enforcing those rights;
- market disruptions created by public health crises in regions outside the United States;
- difficulties in staffing and managing foreign operations, including challenges presented by relationships with workers' councils and labor unions;
- issues related to differences in cultures and practices; and
- changing regional economic, political and regulatory conditions.

U.S. Government regulation and environmental, health and safety concerns may adversely affect our business Our operations in the United States will be subject to the federal, state and local environmental, health and safety laws applicable to the reclamation of lead acid batteries including the Occupational Safety and Health Act ("OSHA") of 1970 and comparable state statutes. Our facilities will have to obtain environmental permits or approvals to expand, including those associated with air emissions, water discharges, and waste management and storage. We may face opposition from local residents or public interest groups to the installation and operation of our facilities. In addition to permitting requirements, our operations are subject to environmental health, safety and transportation laws and regulations that govern the management of and exposure to hazardous materials such as the lead and acids involved in battery reclamation. These include hazard communication and other occupational safety requirements for employees, which may mandate industrial hygiene monitoring of employees for potential exposure to lead.

We are also subject to inspection from time to time by various federal, state and local environmental, health and safety regulatory agencies and, as a result of these inspections, we may be cited for certain items of non-compliance. For example, in August 2018, the Nevada Occupational Safety and Health Administration, or Nevada OSHA, delivered to us a citation and notification of penalty. The citation listed a number of items related to our compliance with Nevada OSHA's Lead Standard. We reached a settlement agreement with Nevada OSHA on the amount of penalties associated with the citation. We also agreed to engage a lead compliance expert to audit our facility at TRIC for compliance with all provision of the Lead Standard and to generate a written report with findings of any noncompliance, recommended corrective actions, and a time frame to correct the findings of noncompliance. We agreed with Nevada OSHA to correct all findings of noncompliance within the time frame proposed by the lead compliance expert in their report. The lead compliance expert has been engaged, has visited the facility at TRIC and has completed the written report. We have corrected all findings of noncompliance in a timely manner.

Failure to comply with the requirements of federal, state and local environmental, health and safety laws could subject our business to significant penalties (civil or criminal) and other sanctions that could adversely affect our business. In addition, in the event we are unable to operate and expand our AquaRefining process and operations as safe and environmentally responsible, we may face opposition from local governments, residents or public interest groups to the installation and operation of our facilities.

The development of new AquaRefining technology by us or our partners or licensees, and the dissemination of our AquaRefining process will depend on our ability to acquire necessary permits and approvals, of which there can be no assurance. As noted above, our AquaRefining processes will have to obtain environmental permits or approvals to operate, including those associated with air emissions, water discharges, and waste management and storage. In addition, we expect that any use of AquaRefining operations at our partner's facilities will require additional permitting and approvals. Failure to secure (or significant delays in securing) the necessary permits and approvals could prevent us and our partners and licensees from pursuing additional AquaRefining expansion, and otherwise adversely affect our business, financial results and growth prospects. Further, the loss of any necessary permit or approval could result in the closure of an AquaRefining and the loss of our investment associated with such facility.

Our business involves the handling of hazardous materials and we may become subject to significant fines and other liabilities in the event we mishandle those materials. The nature of our operations involves risks, including the potential for exposure to hazardous materials such as lead, that could result in personal injury and property damage claims from third parties, including employees and neighbors, which claims could result in significant costs or other environmental liability. Our operations also pose a risk of releases of hazardous substances, such as lead or acids, into the environment, which can result in liabilities for the removal or remediation of such hazardous substances from the properties at which they have been released, liabilities which can be imposed regardless of fault, and our business could be held liable for the entire cost of cleanup even if we were only partially responsible. We are also subject to the possibility that we may receive notices of potential liability in connection with materials that were sent to third-party recycling, treatment, and/or disposal facilities under the Federal Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA"), and comparable state statutes, which impose liability for investigation and remediation of contamination without regard to fault or the legality of the conduct that contributed to the contamination, and for damages to natural resources. Liability under CERCLA is retroactive, and, under certain circumstances, liability for the entire cost of a cleanup can be imposed on any responsible party. Any such liability could result in judgments or settlements that restrict our operations in a manner that materially adversely effects our operations and could result in fines, penalties or awards that could materially impair our financial condition and even threaten our continued operation as a going concern.

We will be subject to foreign government regulation and environmental, health and safety concerns that may adversely affect our business As our business expands outside of the United States, our operations will be subject to the environmental, health and safety laws of the countries where we do business, including permitting and compliance requirements that address the similar risks as do the laws in the United States, as well as international legal requirements such as those applicable to the transportation of hazardous materials. Depending on the country or region, these laws could be as stringent as those in the US, or they could be less stringent or not as strictly enforced. In some countries in which we are interested in expanding our business, such as Mexico and China, the relevant environmental regulatory and enforcement frameworks are in flux and subject to change. Compliance with these requirements will cause our business to incur costs, and failure to comply with these requirements could adversely affect our business.

In the event we are unable to present and operate our AquaRefining process and operations as safe and environmentally responsible, we may face opposition from local governments, residents or public interest groups to the installation and operation of our facilities.

Risks Related to Owning Our Common Stock

A securities class action lawsuit and shareholder derivative lawsuit are pending against us and could have a material adverse effect on our business, results of operations and financial condition. A putative consolidated class action lawsuit and shareholder derivative lawsuit are pending against us and certain of our current and former directors and officers. These lawsuits may divert financial and management resources that would otherwise be used to benefit our operations. Although we deny the material allegations in the lawsuits and intend to defend ourselves vigorously, defending the lawsuits could result in substantial costs. No assurances can be given that the results of these matters will be favorable to us. An adverse resolution of any of these lawsuits could have a material adverse effect on our results of operations and financial condition. In addition, we may be the target of securities-related litigation in the future, both related and unrelated to the existing class action and shareholder derivative lawsuits. Such litigation could divert our management's attention and resources, result in substantial costs, and have an adverse effect on our business, results of operations and financial condition.

We maintain director and officer insurance that we regard as reasonably adequate to protect us from potential claims; however, we are responsible for meeting certain deductibles under the policies and, in any event, we cannot assure you that the insurance coverage will adequately protect us from claims made. Further, as a result of the pending litigation, the costs of insurance may increase and the availability of coverage may decrease. As a result, we may not be able to maintain our current levels of insurance at a reasonable cost, or at all, which might make it more difficult to attract qualified candidates to serve as executive officers or directors.

Our common stock is thinly traded and our share price has been volatile.Our common stock has traded on the Nasdaq Capital Market, under the symbol "AQMS", since July 31, 2015. Since that date, our common stock has at times been relatively thinly traded and subject to price volatility. There can be no assurance that we will be able to successfully maintain a liquid market for our common shares. The stock market in general, and early stage public companies in particular, have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of such companies. If we are unable to develop and maintain a liquid market for our common shares, you may not be able to sell your common shares at prices you consider to be fair or at times that are convenient for you, or at all. In addition, following periods of volatility in the market price of a company's securities, litigation has often been brought against that company and we may become the target of litigation as a result of price volatility. Litigation could result in substantial costs and divert our management's attention and resources from our business. This could have a material adverse effect on our business, results of operations and financial condition.

We have received a notice of delisting or failure to satisfy a continued listing rule from the Nasdaq.On January 15, 2020, we received a notice of delisting from the Nasdaq Stock Market, LLC. The notice stated that we had fallen below compliance with respect to the continued listing standard set forth in Rule 5550(a)(2) of the Nasdaq Listing Rules because the closing bid price of our common stock over the previous 30 consecutive trading-day period had fallen below $1.00 per share.

Pursuant to the notice and Rule 5810(c)(3)(A) of the Nasdaq Listing Rules, we have 180 days from the date of the notice, or until July 13, 2020, to regain compliance with the minimum bid price requirement in Rule 5550(a)(2) by achieving a closing bid price for our common stock of at least $1.00 per share over a minimum of 10 consecutive business days. If we do not regain compliance with Rule 5550(a)(2) during the initial 180-day period, we may be eligible for additional time to regain compliance, subject to our compliance with the Nasdaq's continued listing requirement for market value of publicly-held shares and all other initial listing standards for The Nasdaq Capital Market, with the exception of the bid price requirement, and our provision of certain undertakings to the Nasdaq. However, there can be no assurance that we will be afforded additional time to regain compliance with the minimum bid price requirement following the initial 180-day period. If we are unable to regain compliance with Nasdaq Listing Rule 5550(a)(2) in a timely manner, the Nasdaq will commence suspension and delisting procedures.

We are an "emerging growth company" under the JOBS Act of 2012 and we cannot be certain if the reduced disclosure requirements applicable to emerging growth companies will make our common stock less attractive to investors. We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012 ("JOBS Act"), and we may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies" including, but not limited to:

- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act;
- reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements;
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments; and
- extended transition periods available for complying with new or revised accounting standards.

We have chosen to "opt out" of the extended transition periods available for complying with new or revised accounting standards, but we intend to take advantage of all of the other benefits available under the JOBS Act, including the exemptions discussed above. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

We will remain an “emerging growth company" until 2020, although we will lose that status sooner if our revenues exceed $1.07 billion, if we issue more than $1.07 billion in non-convertible debt in a three-year period, or if the market value of our common stock that is held by non-affiliates exceeds $700 million as of any June 30.

Our status as an “emerging growth company” under the JOBS Act may make it more difficult to raise capital as and when we need it. Because of the exemptions from various reporting requirements provided to us as an “emerging growth company,” we may be less attractive to investors and it may be difficult for us to raise additional capital as and when we need it. Investors may be unable to compare our business with other companies in our industry if they believe that our reporting is not as transparent as other companies in our industry. If we are unable to raise additional capital as and when we need it, our financial condition and results of operations may be materially and adversely affected.

We have not paid dividends in the past and have no plans to pay dividends. We plan to reinvest all of our earnings, to the extent we have earnings, in order to pursue our business plan and cover operating costs and to otherwise become and remain competitive. We do not plan to pay any cash dividends with respect to our securities in the foreseeable future. We cannot assure you that we would, at any time, generate sufficient surplus cash that would be available for distribution to the holders of our common stock as a dividend. Therefore, you should not expect to receive cash dividends on our common stock.

Shares eligible for future sale may adversely affect the market for our common stock. Of the 59,767,720 shares of our common stock outstanding as of the date of this report, approximately 49,746,137 shares are held by “non-affiliates” and are freely tradable without restriction pursuant to Rule 144.

Our charter documents and Delaware law may inhibit a takeover that stockholders consider favorable. Provisions of our certificate of incorporation and bylaws and applicable provisions of Delaware law may delay or discourage transactions involving an actual or potential change in control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares, or transactions that our stockholders might otherwise deem to be in their best interests. The provisions in our certificate of incorporation and bylaws:

- limit who may call stockholder meetings;
- do not permit stockholders to act by written consent;
- do not provide for cumulative voting rights;
- establish an advance notice procedure for stockholders' proposals to be brought before an annual meeting, including proposed nominations of persons for election to our board of directors, and
- provide that all vacancies may be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum.

In addition, Section 203 of the Delaware General Corporation Law may limit our ability to engage in any business combination with a person who beneficially owns 15% or more of our outstanding voting stock unless certain conditions are satisfied. This restriction lasts for a period of three years following the share acquisition. These provisions may have the effect of entrenching our management team and may deprive you of the opportunity to sell your shares to potential acquirers at a premium over prevailing prices. This potential inability to obtain a control premium could reduce the price of our common stock.

Our bylaws designate the Court of Chancery of the State of Delaware as the sole and exclusive forum for certain litigation that may be initiated by our stockholders, which could limit our stockholders’ ability to obtain a favorable judicial forum for disputes with the Company. Our bylaws provide that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (iii) any action asserting a claim against us or any our directors, officers or other employees arising pursuant to any provision of the Delaware General Corporation Law or our certificate of incorporation or bylaws, or (iv) any action asserting a claim against us or any our directors, officers or other employees governed by the internal affairs doctrine. This forum selection provision in our bylaws may limit our stockholders’ ability to obtain a favorable judicial forum for disputes with us or any our directors, officers or other employees.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our executive offices are presently located in 14,016 square feet of mixed office and warehouse space in McCarran, Nevada. We lease these facilities at a lease rate of approximately $10,000 per month. The lease term began in July 2018 and expires December 31, 2021.

Our executive offices were previously located in 21,697 square feet of office and industrial space in a multi-building commercial project known as "Marina Village" located in Alameda, California. The lease term is 76 months, commencing February 1, 2016 and expiring May 31, 2022. We sublet the property with the sublease commencing on February 4, 2019 and expiring May 31, 2022.

We have developed and own a 136,750 square foot LAB recycling facility on 11.73 acres of land located in TRIC, a 107,000-acre park located nine miles east of Reno, Nevada on I-80.

Item 3. Legal Proceedings

Beginning on December 15, 2017, three purported class action lawsuits were filed in the United Stated District Court for the Northern District California against us, Stephen Clarke, Thomas Murphy and Mark Weinswig. On March 23, 2018, the cases were consolidated under the caption *In Re: Aqua Metals, Inc. Securities Litigation* Case No 3:17-cv-07142. On May 23, 2018, the Court appointed lead plaintiffs and approved counsel for the lead plaintiffs. On July 20, 2018, the lead plaintiffs filed a consolidated amended complaint ("Amended Complaint"), on behalf of a class of persons who purchased our securities between May 19, 2016 and November 9, 2017, against us, Stephen Clarke, Thomas Murphy and Selwyn Mould. The Amended Complaint alleges the defendants made false and misleading statements concerning our lead recycling operations in violation of Section 10(b) of the Securities Exchange Act of 1934 ("Exchange Act") and Rule 10b-5 promulgated thereunder and seeks to hold the individual defendants as control persons pursuant to Section 20(a) of the Exchange Act. The Amended Complaint also alleges a violation of Section 11 of the Securities Act of 1933 ("Securities Act") based on alleged false and misleading statements concerning our lead recycling operations contained in, or incorporated by reference in, our Registration Statement on Form S-3 filed in connection with our November 2016 public offering. That claim is asserted on behalf of a class of persons who purchased shares pursuant to, or that are traceable to, that Registration Statement. The Amended Complaint seeks to hold the individual defendants liable as control persons pursuant to Section 15 of the Securities Act. The Amended Complaint seeks unspecified damages and plaintiffs' attorneys' fees and costs. On September 18, 2018, the defendants filed a motion to dismiss the Amended Complaint in its entirety and the plaintiff subsequently filed its opposition to the motion. In an Order dated August 14, 2019, the Court granted in part, and denied in part, the defendants' motion to dismiss. The Court granted the motion to dismiss the Securities Act Section 11 claim and the Exchange Act Section 10(b) and Rule 10b-5 claim based on alleged false and misleading statements and gave the plaintiffs leave to amend to address the deficiencies. The Court denied the motion to dismiss the Exchange Act Section 10(b) and Rule 10b-5 claims regarding site visits. On September 20, 2019, the plaintiffs filed a Second Amended Complaint that dropped the Securities Act Section 11 claim but otherwise alleges the same claims as were alleged previously. The Second Amended Complaint seeks unspecified damages and plaintiffs' attorneys' fees and costs. On November 1, 2019, the defendants filed a motion to dismiss the Exchange Act Section 10(b) and Rule 10b-5 claims in the Second Amended Complaint based on alleged false and misleading statements, but not the claims regarding site visits. The motion is under consideration by the Court. We deny that the claims in the Second Amended Complaint have any merit and we intend to vigorously defend the action.

Beginning on February 2, 2018, five purported shareholder derivative actions were filed in the United States District Court for the District of Delaware against us and certain of our current and former executive officers and directors, Stephen R. Clarke, Selwyn Mould, Thomas Murphy, Mark Weinswig, Vincent DiVito, Mark Slade and Mark Stevenson. On May 3, 2018, the cases were consolidated under the caption *In re Aqua Metals, Inc. Stockholder Derivative Litigation*, Case No. 1:18-cv-00201-LPS (D. Del.). The complaints were filed by persons claiming to be stockholders of Aqua Metals and generally allege that certain of our officers and directors breached their fiduciary duties to us by violating the federal securities laws and exposing us to possible financial liability. The complaints seek unspecified damages and plaintiffs' attorneys' fees and costs. The parties have entered into a stipulation staying the action until 30 days after a decision on our motion to dismiss the Amended Complaint in the class action described above. The individual defendants deny that the claims in the shareholder derivative action have any merit and intend to vigorously defend the action.

A former employee has filed a complaint with Nevada OSHA claiming that he was wrongfully terminated for his protected activities related to safety. The matter is in the investigation stage where OSHA is gathering facts related to the employee's claim. We are contesting the allegations by the employee. An evaluation of the likelihood of an unfavorable outcome cannot be made at this time.

We are not party to any other legal proceedings. We may, from time to time, be party to litigation and subject to claims incident to the ordinary course of business. As our growth continues, we may become party to an increasing number of litigation matters and claims. The outcome of litigation and claims cannot be predicted with certainty, and the resolution of any future matters could materially affect our future financial position, results of operations or cash flows.

Item 4. Mine Safety Disclosures

Inapplicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market Information

Our common stock has traded on the NASDAQ Capital Market under the symbol "AQMS," since our initial public offering on July 31, 2015. Since then, our common stock has been relatively thinly traded at times and has experienced, and is expected to experience in the future, significant price and volume volatility. The following table shows the reported high and low closing prices per share for our common stock-based on information provided by the NASDAQ Capital Market for the periods indicated.

	2019		2018	
	High	Low	High	Low
First Quarter	$ 4.18	$ 1.80	$ 3.00	$ 1.59
Second Quarter	$ 3.10	$ 1.51	$ 4.14	$ 2.26
Third Quarter	$ 2.06	$ 1.54	$ 3.11	$ 2.24
Fourth Quarter	$ 1.91	$ 0.42	$ 2.92	$ 1.55

Holders of Record

As of February 24, 2020, there were eight holders of record of our common stock.

Dividend Policy

We have never declared or paid cash dividends on our common stock. We presently intend to retain earnings, if any, to finance the operation and expansion of our business.

Equity Compensation Plan Information

We have adopted the Aqua Metals, Inc. 2014 Stock Incentive Plan providing for the grant of non-qualified stock options and incentive stock options to purchase shares of our common stock and for the grant of restricted and unrestricted share grants. We have reserved 2,113,637 shares of our common stock under the plan. All of our officers, directors, employees and consultants are eligible to participate under the plan. The purpose of the plan is to provide eligible participants with an opportunity to acquire an ownership interest in our company.

In 2019, our board of directors adopted the Aqua Metals, Inc. 2019 Stock Incentive Plan (the "2019 Plan"). A total of 4,500,000 shares of common stock was authorized for issuance pursuant to the 2019 Plan. The 2019 Plan provides for the following types of stock-based awards: incentive stock options; non-statutory stock options; restricted stock; and performance stock. The 2019 Plan, under which equity incentives may be granted to employees and directors under incentive and non-statutory agreements, requires that the option price may not be less than the fair value of the stock at the date the option is granted. Option awards are exercisable until their expiration, which may not exceed 10 years from the grant date.

The following table sets forth the number and weighted-average exercise price of securities to be issued upon exercise of outstanding options and warrants, and the number of securities remaining available for future issuance, under our equity compensation plan at December 31, 2019.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights		Weighted-Average Exercise Price of Outstanding Options and Warrants	Number of Securities Remaining Available for Future Issuance Under Equity compensation Plans
Equity compensation plans approved by stockholders	2,883,484	(1)	$ 3.46	2,402,326
Equity compensation plans not approved by stockholders	5,645,747	(2)	$ 5.37	—

(1) Includes 2,623,692 shares relating to outstanding options and 259,792 relating to restricted stock units under our stock-based compensation plans.

(2) Consists of warrants issued in connection with financing activities and 840,000 shares relating to outstanding options granted in reliance on Nasdaq Rule 5635(c)(4) .

Unregistered Sales of Equity Securities and Use of Proceeds

None.

Item 6. Selected Financial Data

Inapplicable.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

General

Aqua Metals (NASDAQ: AQMS) is engaged in the business of lead recycling through its novel, proprietary and patented AquaRefining™ technology. AquaRefining is a near room temperature, water and organic acid-based process that greatly reduces environmental emissions. We believe our suite of patented and patent pending AquaRefining technologies will allow the lead-acid battery industry to simultaneously improve the environmental impact of lead recycling and scale recycling production to meet demand. Furthermore, our AquaRefining technologies result in high purity lead. We were formed as a Delaware corporation on June 20, 2014 and since our formation, we have focused our efforts on the development and testing of our AquaRefining process, the construction of our initial lead acid battery, or LAB, recycling facility at the Tahoe Reno Industrial Center, or TRIC, located in McCarran, Nevada and commercializing the AquaRefining process.

We completed the development of our first LAB recycling facility at TRIC and commenced production of battery breaking and limited operations during the first quarter of 2017. In April 2017, we commenced the shipment of products for sale, consisting of lead compounds as well as plastics. In April 2018, we commenced the limited production of lead bullion, including AquaRefined lead. In July 2018, we commenced the sale of pure AquaRefined lead in the form of two tonne blocks and in October 2018 we commenced the sale of AquaRefined lead in the form of battery manufacturing ready ingots. In November 2018, we received official vendor certification from Clarios for our AquaRefined lead and in December 2018, we commenced shipments directly to Clarios owned and partner battery manufacturing facilities.

During the fourth quarter of 2019, the Company focused its efforts on completing the Phase 2 capital upgrades, including work done to commission the remaining 12 modules. On whole, completion of the Phase 2 capital work was expected to improve the plant's contribution margin. These projects included concentrate production improvements, electrolyte chilling improvements, improvements in briquetting our spongy AquaRefined lead to prepare for melting and ingot casting, water recovery and management systems, upgrades to all the AquaRefining modules and finally, the paste drying system to increase our yields and throughput.

On the evening of November 29, 2019, a fire occurred in the AquaRefining area of the recycling facility at TRIC. The fire and related intense heat and smoke caused significant damage to a material amount of equipment in the AquaRefinery area, including all 16 AquaRefining modules, electrical and tank infrastructure, steel superstructure, control wiring and other supporting infrastructure. The floor to ceiling firewall between the AquaRefining area and the rest of the plant isolated the worst of the damage to the AquaRefining area. The firewall also appears to have spared material damage to much of the key front-end process equipment, such as the battery breaker/separation system, concentrate production area, kettles and ingot casting, water treatment and recovery and other important areas of the plant. The administrative office area also remained intact and is now occupied by the remaining employees.

Based on preliminary estimates, as of the date of this report, we believe that the replacement value of the equipment and plant lost or damaged in the fire is approximately $37 million excluding any business interruption cost recovery. Assets on our balance sheet as of December 31, 2019 that were not affected by the fire total approximately $38 million, including the battery breaker, melting kettles, kiln, filter presses, mixing and storage tanks, water recovery system and the building infrastructure plus the land. The Company has $50 million dollars in combined property, equipment and business interruption insurance. Initial estimates for property, plant and business interruption claims may reach total limits. However, this number could change pending detailed analysis and review. As of the date of this report, we expect to receive total coverage and proceeds from our insurance carrier with the initial $15 to $20 million coming in over the next three to six months.

The Company has engaged a public adjuster in business for over 50 years who will support the Company's legal and finance team and provide forensic accounting, construction expertise and direct interface with the insurers to assist the Company in quickly and properly documenting the loss and maximizing the Company's insurance recovery.

As a result of the fire we have suspended all commercial operations and the date on which we can resume revenue producing operations is currently undetermined. Following the fire, an investigation of the fire was commenced by the Storey County Fire Marshal and we were denied access to the fire damaged portion of the facility until late December 2019, at which time we were given access to the fire damaged area. Since then, we have been engaged in the process of analyzing the fire damage and the clean-up and disposal of the damaged equipment. We have also engaged a public adjuster to support our legal and finance team and provide forensic accounting, construction expertise and direct interface with the insurers to assist us in quickly and properly documenting the loss and maximizing our insurance recovery. As of the date of this report, the insurance carriers paid an initial amount of $10.0 million for damages suffered as a result of the fire.

As of the date of this report, we are developing and analyzing a proposed capital light business strategy designed to optimize shareholder value by focusing on licensing opportunities, which have always been a core part of our business plans. We believe this path has the potential to maximize shareholder value in that it could be far less capital intensive than a rebuild and could be funded solely or primarily from a combination of cash on hand, insurance proceeds and asset dispositions. The capital light strategy is consistent with our long-held business strategy and objectives. The approach of this strategy is to pursue licensing opportunities within the lead battery recycling marketplace while securing our cash position by first, working on the successful collection of insurance proceeds with the assistance of our retained public adjuster and special counsel to facilitate the collection for property and business interruption losses; second, conducting the disposal of certain assets not essential to the capital light licensing strategy; and, third, restructuring the remaining balance on the USDA-backed loan with Green Bank that was initially set up for a running facility and would be impractical with a shift to capital light technology licensing.

Since January 1, 2019, we have engaged in the following financing transactions:

In January 2019, we completed a public offering of 5,175,000 shares of our common stock, at the price of $1.90 per share, for gross proceeds of $9.8 million. After the payment of underwriter discounts and offering expenses, we received net proceeds of approximately $9.1 million.

On February 26, 2019, after engaging in extensive diligence and engineering evaluations, we signed a long-term contract with Veolia North America Regeneration Services LLC (Veolia), to provide operations, maintenance and management services at Aqua Metals’ AquaRefining facility in McCarran, Nevada. In consideration of the services to be provided by Veolia under the agreement, we agreed to issue to Veolia a total of 2,350,000 shares of our common stock in eight quarterly installments of 293,750 shares. Each installment is subject to weighted average antidilution adjustments in the event of our sale of common shares for cash consideration during the preceding quarterly period at a price less than $2.41 per share. In consideration of the antidilution adjustments, the number of shares to be issued in each installment shall be capped at the current market value of $1.25 million based on the volume weighted average price of our shares over the 20 trading days preceding the date for issuance of such installment. We also agreed to issue to Veolia, on the one-year anniversary of the agreement, warrants to purchase an additional 2,000,000 shares of our common stock at an exercise price of $5.00 per share and, on the second anniversary of the agreement, warrants to purchase an additional 2,000,000 shares of our common stock at an exercise price $7.00 per share. The warrants will have a term of ten years from the date of issuance. As of the date of this report, we have issued a total of 1,184,985 shares to Veolia. As a result of the fire, however, we have declared force majeure and all further issuances to Veolia have been suspended.

In May 2019, we completed a public offering of 11,000,000 shares of our common stock, at the price of $2.00 per share, for gross proceeds of $22.0 million. After the payment of underwriter discounts and offering expenses, we received net proceeds of approximately $20.3 million.

Results of Operations for the Fiscal Year Ended December 31, 2019 Compared to the Fiscal Year Ended December 31, 2018

During the year ending December 31, 2019, product sales consisted of lead bullion, lead compounds and plastics. Product sales during the second and third quarter of 2019 consisted of high-purity lead from our AquaRefining process as well as lead bullion, lead compounds, and plastics. The following table summarizes our results of operations with respect to the items set forth below for the twelve months ended December 31, 2019 together with the percentage change in those items (in thousands).

	Year ended December 31,			
	2019	**2018**	**Favorable (Unfavorable)**	**% Change**
Product sales	$ 4,874	$ 4,449	$ 425	10 %
Cost of product sales	24,799	22,761	(2,038)	(9) %
Research and development cost	1,555	4,502	2,947	65 %
General and administrative expense	19,314	14,214	(5,100)	(36) %
Total operating expense	$ 45,668	$ 41,477	$ (4,191)	(10) %

As mentioned previously, product sales consist of high-purity lead from our AquaRefining process as well as lead bullion, lead compounds and plastics. Revenue for the twelve months ended December 31, 2019 increased approximately 10% compared to the twelve months ended December 31, 2018 as a result of increased production during 2019. During 2018, revenue was mainly derived from the sale of lead compounds and plastics. During the second quarter of 2019 and throughout the third quarter, we began to increase production by the addition of modules and increased efficiencies. During the fourth quarter, we limited the operations of our AquaRefining in order to focus resources on the implementation of plant improvements and enhancing process efficiencies. Revenue in the fourth quarter of 2019 was impacted by limited operations due to construction and by the fire.

Cost of product sales includes raw materials, supplies and related costs, salaries and benefits, consulting and outside services costs, depreciation and amortization costs and insurance, travel and overhead costs. Cost of product sales increased approximately 9% for the twelve months ended December 31, 2019, as compared to the twelve months ended December 31, 2018. Cost of product sales were lower in 2018 due to lower production rates. Cost increases in 2019 were also affected by the ramping-up operations using the AquaRefining process.

Research and development cost included expenditures related to the improvement of the AquaRefining technology. During the twelve months ended December 31, 2019, research and development costs decreased approximately 65% over the comparable period in 2018. The decline in research and development cost is primarily the result of management's focus on preparing the plant for the scaling of commercial operations and a reduced emphasis on research and development activities due to the fact that the AquaRefining for lead technology has matured and we paused the research and development stage. As a result, there has been a significant reduction in research and development staffing subsequent to the comparable periods in 2018.

General and administrative expense increased approximately 36% for the twelve months ended December 31, 2019 compared to the twelve months ended December 31, 2018. The most significant drivers of these increases were non-cash expense items. For the twelve months ended December 31, 2019, we had $9.0 million of non-cash expense related to the Veolia agreement (as previously discussed). In addition, non-cash stock-based compensation to our employees and directors increased by approximately $2.8 million compared to the twelve months ended December 31, 2018. We also incurred costs of approximately $0.2 million for professional service fees associated with the sublease of the Alameda facility. The twelve months ended December 31, 2018 included $0.9 million severance for our former chief executive officer and $0.9 million severance for our former chief operating officer, as well as a net $0.4 million noncash charge associated with a warrant modification related to Interstate Battery and $0.9 million in increased legal fees associated with proxy and solicitation fees related to efforts to address activist investors.

The following table summarizes our other income and interest expense for the years ended December 31, 2019 and December 31, 2018 together with the percentage change in those items (in thousands).

	Year ended December 31,			
	2019	2018	Favorable (Unfavorable)	% Change
Other (expense) income				
Insurance proceeds net of related expenses	$ (792)	$ —	$ (792)	— %
Interest expense	$ (3,477)	$ (3,447)	$ (30)	1 %
Interest and other income	$ 270	$ 223	$ 47	21 %

Insurance proceeds net of related expenses is a result of $17.4 million of expected insurance proceeds and $2.5 million of insurance proceeds received offset by $19.9 million of fire damaged assets and $0.8 million of other related expenses. Interest expense is related primarily to the $5.0 million Interstate Battery convertible note and the $10.0 million note payable to Green Bank, amortization of debt issuance costs incurred in connection with both of these notes, as well as an accrual for the USDA guarantee fee on the $10.0 million note to Green Bank. On January 24, 2019, we repaid Interstate Battery the outstanding principal and interest on the convertible debt in the amount of $6.7 million. As a result of this debt repayment, we amortized the remaining discount on the note of $2.6 million and remaining deferred financing expenses of $20,000 to interest expense.

Interest income increased for the twelve months ended December 31, 2019 compared to the same period in 2018 due to higher cash balances during the year.

Liquidity and Capital Resources

As of December 31, 2019, we had total assets of $69.5 million and working capital of $17.7 million, which includes $17.4 million of insurance proceeds receivable, of which we have received $7.5 million of insurance proceeds received after December 31, 2019.

The following table summarizes our cash used in operating, investing and provided by financing activities (in thousands):

	Year ended December 31,	
	2019	2018
Net cash used in operating activities	$ (25,177)	$ (26,318)
Net cash used in investing activities	$ (10,574)	$ (3,929)
Net cash provided by financing activities	$ 22,434	$ 28,346

Net cash used in operating activities

Net cash used in operating activities for the years ended December 31, 2019 and December 31, 2018 was $25.2 million and $26.3 million, respectively. Net cash used in operating activities during each of these periods consisted primarily of our net loss adjusted for noncash items such as depreciation, amortization, stock-based compensation charges, and non-cash payments to Veolia, as well as net changes in working capital. Cash used for general and administrative expenses decreased approximately $1.5 million during the year ended December 31, 2019 as compared to the same period last year.

Net cash used in investing activities

Net cash used in investing activities for the years ended December 31, 2019 and December 31, 2018 was $10.6 million and $3.9 million, respectively. Net cash used in investing activities during each of these periods consists primarily of purchases of fixed assets related to the phase two construction of our final production upgrades at our TRIC facility in Nevada and was offset by cash insurance proceeds of $2.5 million. In March of 2019, we disposed of the capital shares of our UK subsidiary, Ebonex IPR, Ltd. The sale price was a nominal cash amount and did not contribute to net cash used in investing activities.

Net cash provided by financing activities

Net cash provided by financing activities for the year ended December 31, 2019 consisted of $9.1 million net proceeds from our January 2019 public offering and $20.3 million net proceeds from our May 2019 public offering. This increase to cash flows was offset by a $6.7 million payoff of the Interstate Battery convertible note. Net cash provided by financing activities for the year ended December 31, 2018 consisted of $26.6 million net proceeds from our June 2018 public offering and $2.1 million net proceeds from the January 2018 exercise of the underwriter's overallotment option related to our December 2017 public offering.

As of December 31, 2019, we had total cash of $7.6 million and working capital of $17.7 million, which includes $17.4 million of insurance proceeds receivable, of which we have received $7.5 million of insurance proceeds received after December 31, 2019.. As of the date of this report, we believe that we may require additional capital, depending on timing of insurance payments, in order to fund our current level of ongoing costs over the next twelve months and move forward with our capital light licensing strategy. There can be no assurance that we will be able to collect insurance proceeds or to acquire the necessary funding on commercially reasonable terms or at all. We intend to seek funds primarily from insurance proceeds and the possible sale of equipment that is not required for our capital light strategy. However, there can be no assurance that such funds will be available. If needed, we may seek funding through the sale of equity or debt financing. Funding that includes the sale of our equity may be dilutive. If such financing is not available on satisfactory terms, we may be unable to further pursue our business plan and we may be unable to continue operations. Additionally, we were not in compliance with the minimum debt service coverage ratio covenant on our loan from Green Bank as of the fiscal quarter ends between March 31, 2017 and December 31, 2019. We received a waiver for the minimum debt service coverage ratio covenant for those periods. While we expect to continue to receive waivers from Green Bank for non-compliance with such covenant, there is no guarantee that we will receive such waivers. If Green Bank determines not to grant us a waiver for non-compliance in the future, we would be in default of the loan and Green Bank would be able to accelerate the payment of all amounts under the loan.

On April 23, 2019, we reached an agreement with our primary lender, Green Bank, to waive certain covenants and allow us to enter into new capital and/or operating leases. Pursuant to the waiver, we are approved to enter into new capital and/or operating leases in the total amount of up to $5.0 million.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet financing arrangements.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles, or U.S. GAAP. The preparation of our consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the consolidated financial statements, and the reported amounts of expenses during the period. Significant items subject to such estimates and assumptions include the carrying amount and valuation of long-lived assets, the valuation of conversion features of convertible debt, valuation allowances for deferred tax assets, the determination of estimated asset retirement obligations, the determination of stock option expense, and the determination of the fair value of stock warrants issued. Our actual results could differ from these estimates under different assumptions or conditions.

While our significant accounting policies are more fully described in Note 2 to the consolidated financial statements included in Item 8 of this Annual Report on Form 10-K, we believe that the following accounting policies are the most critical to assist stockholders and investors reading the consolidated financial statements in fully understanding and evaluating our financial condition and results of operations.

Accounts receivable

We sell our products to large well-established companies and extend credit without requiring collateral, based on an ongoing evaluation of the customer's business prospects and financial condition. In the event that payment of a customer's account receivable is doubtful, we would reserve the receivable under an allowance for doubtful accounts.

Inventory

Inventory is stated at the lower of cost or net realizable value. Inventory cost is recorded on a first-in, first-out basis using the weighted average method. Net realizable value is determined as the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion, disposal, and transportation.

Property and equipment

Property and equipment are stated at cost net of accumulated depreciation. Depreciation on property and equipment is calculated on the straight-line basis over the estimated useful lives of the assets. Leasehold improvements are depreciated over the shorter of the life of the asset or the remaining term of the lease.

Intangible and other long-lived assets

The intangible assets consist of a patent application contributed to us by five founding stockholders, patent applications for technology developed by us and trademark applications. The useful life of the intangible assets has been determined to be ten years and the assets are being amortized. We periodically evaluate our intangible and other long-lived assets for indications that the carrying amount of an asset may not be recoverable. In reviewing for impairment, we compare the carrying value of such assets to the estimated undiscounted future cash flows expected from the use of the assets and their eventual disposition. When the estimated undiscounted future cash flows are less than their carrying amount, an impairment loss is recognized equal to the difference between the assets' fair value and their carrying value. In addition to the recoverability assessment, we routinely review the remaining estimated lives of our long-lived assets. Any reduction in the useful life assumption will result in increased depreciation and amortization expense in the period when such determination is made, as well as in subsequent periods. We evaluate the need to record impairment during each reporting period. No impairment has been recorded. We determined that the estimated life of the intellectual property properly reflected the current remaining economic life of the asset.

Asset retirement obligations

We record the fair value of estimated asset retirement obligations associated with tangible long-lived assets in the period incurred. Retirement obligations associated with long-lived assets are those for which there is an obligation for closures and/or site remediation at the end of the assets' useful lives. These obligations are initially estimated based on discounted cash flow estimates and are accreted to full value over time through charges to operating expense. In addition, asset retirement costs are capitalized as part of the related asset's carrying value and are depreciated on a straight-line basis over the assets' respective useful lives.

Revenue Recognition

The Company records revenue recognition in accordance with ASC 606,*Revenue from Contracts with Customers.* ASC 606 provides a single comprehensive model for the recognition of revenue arising from contracts with customers and supersedes most current revenue recognition guidance, including industry-specific guidance. It requires an entity to recognize revenue when the entity transfers promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. ASC 606 creates a five-step model that requires entities to exercise judgment when considering the terms of contract(s), which includes (1) identifying the contract(s) with the customer, (2) identifying the separate performance obligations in the contract, (3) determining the transaction price, (4) allocating the transaction price to the separate performance obligations, and (5) recognizing revenue as each performance obligation is satisfied. ASC 606 requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including qualitative and quantitative information about contracts with customers, significant judgments and changes in judgments and assets recognized from costs incurred to obtain or fulfill a contract.

Insurance Proceeds

On November 29, 2019, there was a fire in the Aqua Refining area of the plant. As of December 31, 2019, the Company has received $2.5 million in insurance payments as a result of the fire damage. Subsequent to year end the Company received an additional $7.5 million of insurance proceeds. The Company has also determined that it is probable to receive at least an additional $14.9 million in insurance proceeds. This expectation resulted in a $17.4 million insurance receivable at December 31, 2019.

Research and development

Research and development expenditures are expensed as incurred.

Income taxes

We account for income taxes in accordance with the liability method of accounting for income taxes. Under the liability method, deferred assets and liabilities are recognized based upon anticipated future tax consequences attributable to differences between financial statement carrying amounts of assets and liabilities and their respective tax bases. The provision for income taxes is comprised of the current tax liability and the changes in deferred tax assets and liabilities. We established a valuation allowance to the extent that it is more likely than not that deferred tax assets will not be recoverable against future taxable income.

We recognize the effect of uncertain income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount that is greater than 50% likely of being realized. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs.

Stock-based compensation

We recognize compensation expense for stock-based compensation in accordance with ASC 718 “Compensation – Stock Compensation.” For employee stock-based awards, we calculate the fair value of the award on the date of grant using the Black-Scholes-Merton method for stock options; the expense is recognized over the service period for awards to vest.

The estimation of stock-based awards that will ultimately vest requires judgment and to the extent actual results or updated estimates differ from the original estimates, such amounts are recorded as a cumulative adjustment in the period estimates are revised. The Company considers many factors when estimating expected forfeitures, including types of awards, employee class and historical experience.

Recent accounting pronouncements

See recent accounting pronouncements in Note 2 of the Consolidated Financial Statements located in Item 8 in this Annual Report.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations as of December 31, 2019 and the effect such obligations are expected to have on our liquidity and cash flow in the future years (in thousands):

	Total	Less than 1 year	1 to 3 years	3 to 5 years	More than 5 years
Operating lease obligations	$ 1,530	$ 642	$ 888	$ —	—
Notes payable	9,306	296	663	762	7,585
	$ 10,836	$ 938	$ 1,551	$ 762	$ 7,585

Note: Excludes a finance lease with current liability of $6 and a non-current liability of $25.

Operating lease obligations

We lease our Alameda, California and McCarran, Nevada spaces under non-cancelable operating leases, expiring in 2022 and 2021, respectively. On February 4, 2019, we entered into a sublease agreement effective as of February 1, 2019 for the Alameda, California facility. The term of the sublease commenced on February 4, 2019, and ends on May 31, 2022. The above obligations do not include partially offsetting sublease income of approximately $1.2 million for the remainder of the Alameda lease agreement.

Finance lease obligation

The Company currently maintains one finance lease for equipment. Our finance lease is immaterial to our consolidated financial statements.

Long-term debt

Aqua Metals Reno, Inc. entered into a $10,000,000 loan with Green Bank on November 3, 2015. The term of the loan is twenty-one years. For the first twelve months, only interest was payable; thereafter monthly payments of interest and principal are due. The interest rate adjusts on the first day of each calendar quarter equal to the greater of six percent (6%) or two percent (2%) per annum above the minimum prime lending rate charged by large U.S. money center commercial banks as published in the Wall Street Journal. See Note 12 in the accompanying notes to the consolidated financial statements for further description.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We do not enter into financial instruments for trading or speculative purposes. Our cash, cash equivalents and restricted cash balances as of December 31, 2019 consisted of cash and cash equivalents. Our primary exposure to market risk is interest expense related to our debt with Green Bank. The interest rate on this loan adjusts on the first day of each calendar quarter equal to the greater of six percent (6%) or two percent (2%) per annum above the minimum prime lending rate charged by large U.S. money center commercial banks as published by the Wall Street Journal. We experience market risk with respect to the volatility of lead commodity prices. The purchase price of our primary raw material used lead acid batteries (used LABs), and the sales price of our lead-based finished products are based on commodity pricing. Due to the relatively short turnaround between the purchase of used LABs and the sale of our finished goods, we believe the risk is minimized.

Item 8. Financial Statements and Supplementary Data

Index To Consolidated Financial Statements

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and
Stockholders of Aqua Metals, Inc. and Subsidiaries:

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Aqua Metals, Inc. and Subsidiaries (collectively the "Company") as of December 31, 2019 and 2018, the related consolidated statements of operations, stockholders' equity, and cash flows, for each of the two years in the period ended December 31, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

We have served as the Company's auditor since 2014.

/s/ Armanino LLP
San Ramon, CA
March 11, 2020

AQUA METALS, INC.
Consolidated Balance Sheets
(in thousands, except share and per share amounts)

ASSETS	December 31, 2019	December 31, 2018
Current assets		
Cash and cash equivalents	$ 7,575	$ 20,892
Accounts receivable	244	725
Insurance proceeds receivable	17,446	—
Inventory	1,257	765
Prepaid expenses and other current assets	981	370
Total current assets	27,503	22,752
Non-current assets		
Property and equipment, net	37,643	45,548
Intellectual property, net	999	1,271
Other assets	3,309	1,800
Total non-current assets	41,951	48,619
Total assets	$ 69,454	$ 71,371
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities		
Accounts payable	$ 4,829	$ 2,088
Accrued expenses	4,133	5,196
Deferred rent, current portion	—	8
Lease liability, current portion	552	121
Notes payable, current portion	296	311
Convertible note payable, current portion	—	4,075
Total current liabilities	9,810	11,799
Deferred rent, non-current portion	—	27
Lease liability, non-current portion	861	110
Asset retirement obligation	790	745
Notes payable, non-current portion	8,404	8,600
Total liabilities	19,865	21,281
Commitments and contingencies		
Stockholders' equity		
Common stock; $0.001 par value; 100,000,000 and 50,000,000 shares authorized as of December 31, 2019 and December 31, 2018, respectively; 57,997,780 and 38,932,437 shares issued and outstanding as of December 31, 2019 and December 31, 2018, respectively	58	39
Additional paid-in capital	189,422	145,147
Accumulated deficit	(139,891)	(95,096)
Total stockholders' equity	49,589	50,090
Total liabilities and stockholders' equity	$ 69,454	$ 71,371

The accompanying notes are an integral part of these consolidated financial statements.

AQUA METALS, INC.
Consolidated Statements of Operations
(in thousands, except share and per share amounts)

	Year ended December 31, 2019	Year ended December 31, 2018
Product sales	$ 4,874	$ 4,449
Operating cost and expense		
Cost of product sales	24,799	22,761
Research and development cost	1,555	4,502
General and administrative expense	19,314	14,214
Total operating expense	45,668	41,477
Loss from operations	(40,794)	(37,028)
Other income and expense		
Insurance proceeds net of related expenses	(792)	—
Interest expense	(3,477)	(3,447)
Interest and other income	270	223
Total other expense, net	(3,999)	(3,224)
Loss before income tax expense	(44,793)	(40,252)
Income tax expense	(2)	(2)
Net loss	$ (44,795)	$ (40,254)
Weighted average shares outstanding, basic and diluted	52,263,885	34,154,826
Basic and diluted net loss per share	$ (0.86)	$ (1.18)

The accompanying notes are an integral part of these consolidated financial statements.

AQUA METALS, INC.
Consolidated Statements of Stockholders' Equity (Deficit)
(in thousands, except share amounts)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Equity (Deficit)
	Shares	Amount			
December 31, 2017	27,554,076	$ 27	$ 113,780	$ (54,842)	$ 58,965
Stock-based compensation	—	—	1,201	—	1,201
Common stock issued under Officers and Directors Purchase Plan	2,034	—	4	—	4
Common stock issued upon RSU vesting	65,600	—	—	—	—
Common stock issued for consulting services	152,727	—	423	—	423
Common stock issued in overallotment related to December 2017 Public Offering, net of $10 transaction costs	1,072,500	2	2,101	—	2,103
Common stock issued for cash in June 2018 Public Offering, net of $2,096 transaction costs	10,085,500	10	26,636	—	26,646
Modification of Interstate Batteries warrant #1	—	—	1,002	—	1,002
Net loss	—	—	—	(40,254)	(40,254)
Balances, December 31, 2018	38,932,437	$ 39	$ 145,147	$ (95,096)	$ 50,090
Stock-based compensation	—	—	4,206	—	4,206
Warrants issued related to Veolia agreement	—	—	5,780	—	5,780
Common stock issued upon RSU vesting	854,064	1	—	—	1
Common stock issued for consulting services	2,036,279	2	4,925	—	4,927
Common stock issued in January 2019 public offering, net of $739 transaction costs	5,175,000	5	9,058	—	9,063
Common stock issued in May 2019 public offering, net of $1,683 transaction costs	11,000,000	11	20,306	—	20,317
Net loss	—	—	—	(44,795)	(44,795)
Balances, December 31, 2019	57,997,780	$ 58	$ 189,422	$ (139,891)	$ 49,589

The accompanying notes are an integral part of these consolidated financial statements.

AQUA METALS, INC.
Consolidated Statements of Cash Flows
(in thousands)

	Year ended December 31, 2019	2018
Cash flows from operating activities:		
Net loss	$ (44,795)	$ (40,254)
Reconciliation of net loss to net cash used in operating activities		
Depreciation	3,899	3,213
Amortization of intellectual property	182	190
Accretion of asset retirement obligation	46	44
Fair value of warrant modification, net	—	402
Fair value of common stock issued for consulting services	4,925	423
Stock-based compensation	4,206	1,201
Warrant expense	5,780	—
Amortization of debt discount	—	2,006
Amortization of deferred financing costs	56	83
Non-cash convertible note interest expense	2,556	690
Non-cash interest expense	95	—
Lease liability, net of deferred rent write-off	—	(493)
Amortization of lease liability	—	(80)
Loss on sale of Ebonex asset	90	—
Loss on sale of equipment	149	869
Inventory adjustment	—	179
Changes in operating assets and liabilities		
Accounts receivable	481	157
Inventory	(492)	295
Prepaid expenses and other current assets	(612)	400
Accounts payable	823	472
Accrued expenses	(2,031)	4,009
Deferred rent	(35)	(124)
Other assets and liabilities	(500)	—
Net cash used in operating activities	(25,177)	(26,318)
Cash flows from investing activities:		
Purchases of property and equipment	(12,802)	(3,693)
Other assets	—	(236)
Equipment deposits and other assets	(272)	—
Insurance proceeds	2,500	—
Net cash used in investing activities	(10,574)	(3,929)
Cash flows from financing activities:		
Proceeds from issuance of common stock, net of transaction costs	29,380	28,753
Payments on notes payable	(295)	(277)
Payments on capital leases	—	(130)
Payments on convertible note	(6,651)	—
Net cash provided by financing activities	22,434	28,346
Net decrease in cash, cash equivalents and restricted cash	(13,317)	(1,901)
Cash, cash equivalents and restricted cash at beginning of period	20,892	22,793
Cash, cash equivalents and restricted cash at end of period	$ 7,575	$ 20,892

AQUA METALS, INC.
Consolidated Statements of Cash Flows
(in thousands)

(Continued)

	Year ended December 31,	
	2019	2018
Supplemental disclosure of cash flow information:		
Cash paid for interest, net of amounts capitalized	$ 697	$ 668
Cash paid for income taxes	$ 2	$ 2
Non-cash financing activities		
Capital lease	$ —	$ 38
Fair value of common stock issued to consultants	$ 4,925	$ 423
Total non-cash financing activities	$ 4,925	$ 461
Supplemental disclosure of non-cash transactions		
Change in property and equipment resulting from change in accounts payable	$ (1,921)	$ 180
Change in property and equipment resulting from change in accrued expenses	$ (928)	$ (14)
Change in equity resulting from change in accrued expenses	$ 1,300	$ 600
Change in property and equipment resulting from fire damaged assets written off	$ (19,946)	$ —
Change in insurance proceeds receivable resulting from fire	$ 17,446	$ —

The accompanying notes are an integral part of these consolidated financial statements.

1. Organization and Operations

Aqua Metals, Inc. (the "Company") was incorporated in Delaware and commenced operations on June 20, 2014 (inception). On January 27, 2015, the Company formed two wholly-owned subsidiaries, Aqua Metals Reno, Inc. ("AMR") and Aqua Metals Operations, Inc. (collectively, the "Subsidiaries"), both incorporated in Delaware. The Company is engaged in the business of lead recycling through its patented and patent-pending AquaRefining™ technology. Unlike smelting, AquaRefining is a room temperature, water-based process that emits less pollution than smelting, the traditional method of lead recycling. The Company built its first recycling facility in Nevada's Tahoe Reno Industrial Center ("TRIC") in McCarran, Nevada and intends to pursue the development of additional lead acid battery recycling facilities based on the Company's AquaRefining technology, likely through licensing or joint development arrangements. The Company commenced the shipment of products for sale, consisting of lead compounds and plastics, in April 2017, and through March 31, 2018, substantially all revenue was derived from the sale of lead compounds and plastics. In April 2018, the Company began shipping cast lead bullion (mixture of lead purchased to prime the kettles and AquaRefined lead from our AquaRefining process) blocks in addition to lead compounds and plastics and in June 2018, the Company began shipping high-purity lead from its AquaRefining process. During the second and third quarters of 2019 we operated up to four of our initial modules (modules 1 through 4) on a 24x7 basis. Throughout these quarters, the Company made significant progress related to its goal of ramping up the plant to full production. Some of the milestones reached were related to production and revenue records while at the same time reducing general and administrative expense. During the fourth quarter of 2019, the Company focused its efforts on completing the Phase 2 capital upgrades, including work done to commission the remaining 12 modules. On whole, completion of the Phase 2 capital work would enable the plant to operate at a positive contribution margin. These projects included concentrate production improvements, electrolyte chilling improvements, improvements in briquetting our spongy AquaRefined lead to prepare for melting and ingot casting, water recovery and management systems, upgrades to all the AquaRefining modules and finally, the paste drying system to increase our yields and throughput. On the evening of November 29, 2019, a fire occurred in the AquaRefining area of the facility. The fire and related intense heat and smoke caused significant damage to a material amount of equipment in the AquaRefinery area, including all 16 AquaRefining modules, electrical and tank infrastructure, steel superstructure, control wiring and other supporting infrastructure. As of the date of this report, we are developing and analyzing a strategy of accelerating licensing activities rather than engaging in a capital intensive rebuild of the facility.

Liquidity and Management Plans

The Company generated revenues of $4.9 million and $4.4 million during the years ended December 31, 2019 and December 31, 2018, respectively. The Company had net losses of $44.8 million and $40.3 million for the years ended December 31, 2019 and December 31, 2018, respectively. As of December 31, 2019, the Company's cash balance was $7.6 million. As of the date of this report, we believe that we may require additional capital, depending on timing of insurance payments, in order to fund our current level of ongoing costs over the next twelve months and move forward with our capital light licensing strategy.

2. Summary of Significant Accounting Policies

Basis of presentation and consolidation

The accompanying consolidated financial statements include those of Aqua Metals, Inc. and its subsidiaries, after elimination of all intercompany accounts and transactions. We have prepared the accompanying consolidated financial statements in accordance with accounting principles generally accepted in the United States of America ("GAAP") and pursuant to the rules and regulations of the United States Securities and Exchange Commission (the "SEC").

Use of estimates

The preparation of the consolidated financial statements requires management of the Company to make a number of estimates and assumptions relating to the reported amount of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the consolidated financial statements, and the reported amounts of expenses during the period. Significant items subject to such estimates and assumptions include the carrying amount and valuation of long-lived assets, the valuation of conversion features of convertible debt, valuation allowances for deferred tax assets, the determination of fair value of estimated asset retirement obligations, the determination of stock option expense and the determination of the fair value of stock warrants issued. Actual results could differ from those estimates.

Cash and cash equivalents

The Company considers all highly liquid instruments with original or remaining maturities of ninety days or less at the date of purchase to be cash equivalents. The Company maintains its cash balances in large financial institutions. Periodically, such balances may be in excess of federally insured limits.

Accounts receivable

The Company sells its products to large well-established companies and extends credit without requiring collateral, based on an ongoing evaluation of the customer's business prospects and financial condition. In the event that payment of a customer's account receivable is doubtful, the Company would reserve the receivable under an allowance for doubtful accounts. As of December 31, 2019, and December 31, 2018, the Company believes that all receivables have been or will be collected and, therefore, has not created any reserve for doubtful accounts.

Inventory

Inventory is stated at the lower of cost or net realizable value. Cost is recorded on a first-in, first-out basis using the weighted average method. Net realizable value is determined as the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion, disposal, and transportation. The Company records a write-down, if necessary, to reduce the carrying value of inventory to its net realizable value. The effect of these write-downs is to establish a new cost basis in the related inventory, which is not subsequently written up.

Property and equipment

Property and equipment are stated at cost net of accumulated depreciation. Depreciation on property and equipment is calculated on the straight-line basis over the estimated useful lives of the assets. Leasehold improvements are depreciated over the shorter of the life of the asset or the remaining term of the lease.

Intangible and other long-lived assets

Intangible assets consist of a patent application contributed to the Company by five founding stockholders, patent applications for technology developed by the Company, trademark applications and a patent portfolio acquired during 2017. The useful life of this intellectual property has been determined to be ten years and the assets are being amortized straight-line over this period. The Company periodically evaluates its intangible and other long-lived assets for indications that the carrying amount of an asset may not be recoverable. In reviewing for impairment, the Company compares the carrying value of such assets to the estimated undiscounted future cash flows expected from the use of the assets and their eventual disposition. When the estimated undiscounted future cash flows are less than their carrying amount, an impairment loss is recognized equal to the difference between the assets' fair value and their carrying value. In addition to the recoverability assessment, the Company routinely reviews the remaining estimated lives of its long-lived assets. Any reduction in the useful life assumption will result in increased depreciation and amortization expense in the period when such determination is made, as well as in subsequent periods. The Company evaluates the need to record impairment during each reporting period. As of December 31, 2019, the Company determined that the estimated life of the intellectual property properly reflected the current remaining economic life of the asset.

Asset retirement obligations

The Company records the fair value of estimated asset retirement obligations associated with tangible long-lived assets in the period incurred. Retirement obligations associated with long-lived assets are those for which there is an obligation for closures and/or site remediation at the end of the assets' useful lives. These obligations are initially estimated based on discounted cash flow estimates and are accreted to full value over time through charges to operating expense. In addition, asset retirement costs are capitalized as part of the related asset's carrying value and are depreciated on a straight-line basis over the assets' respective useful lives.

Revenue Recognition

The Company records revenue in accordance with Accounting Standards Codification ("ASC") 606, Revenue from Contracts with Customers. ASC 606 provides a single comprehensive model for the recognition of revenue arising from contracts with

customers and supersedes most current revenue recognition guidance, including industry-specific guidance. It requires an entity to recognize revenue when the entity transfers promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. ASC 606 creates a five-step model that requires entities to exercise judgment when considering the terms of contract(s), which includes (1) identifying the contract(s) with the customer, (2) identifying the separate performance obligations in the contract, (3) determining the transaction price, (4) allocating the transaction price to the separate performance obligations, and (5) recognizing revenue as each performance obligation is satisfied. ASC 606 requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including qualitative and quantitative information about contracts with customers, significant judgments and changes in judgments and assets recognized from costs incurred to obtain or fulfill a contract.
Revenue is generally recognized with the delivery of the Company's products, primarily hard lead, lead compounds and plastics, to customers. Sales, value add, and other taxes, if any, that are collected concurrent with revenue-producing activities are excluded from revenue as they are subsequently remitted to governmental authorities. Incidental items that are immaterial in the context of the contract are recognized as expense. Freight and shipping costs related to the transfer of the Company's products to customers are included in revenue and cost of product sales. Payment on invoices is generally due within 30 days of the invoice.

Arrangements with Multiple Performance Obligations

Contracts with customers may include multiple performance obligations. A performance obligation is a promise in a contract to transfer a distinct good or service to the customer and is the unit of account in ASC 606. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. The Company expects that many of our contracts will have a single performance obligation as the promise to transfer the individual goods or services will not be separately identifiable from other promises in the contracts and therefore, not distinct. For contracts with multiple performance obligations, revenue will be allocated to each performance obligation based on the Company's best estimate of the standalone selling price of each distinct good or service in the contract. The primary method used to estimate standalone selling prices is based on prices charged separately to customers or expected cost-plus margin. At present, the Company does not have any arrangements with multiple performance obligations.

Significant Judgments

The Company estimates variable consideration for arrangements where the transaction price is not fully determinable until the completion of yield testing. The Company estimates variable consideration at the most likely amount to which it expects to be entitled and includes estimated amounts in revenue to the extent it is probable that a significant reversal of revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Adjustments to revenue is recognized in the period when the uncertainty is resolved. To date, any adjustments to estimates have not been material.

Practical Expedients and Exemptions

The Company does not disclose the value of unsatisfied performance obligations for (i) contracts with an original expected length of one year or less and (ii) contracts for which we recognize revenue at the amount to which we have the right to invoice for services performed.

Insurance Proceeds

On November 29, 2019, there was a fire in the AquaRefining area of the TRIC facility. As of December 31, 2019, the Company has received $2.5 million in insurance payments as a result of the fire damage. Subsequent to year end the Company received an additional $7.5 million of insurance proceeds. The Company has also determined that it is probable that it will receive at least an additional $14.9 million in insurance proceeds during the 2020 fiscal year. This expectation resulted in a $17.4 million insurance receivable at December 31, 2019. This amount is included in insurance proceeds receivable in the accompanying Consolidated Balance Sheets.

Research and development

Research and development expenditures are expensed as incurred.

Income taxes

The Company accounts for income taxes in accordance with the liability method of accounting for income taxes. Under the liability method, deferred assets and liabilities are recognized based upon anticipated future tax consequences attributable to differences between financial statement carrying amounts of assets and liabilities and their respective tax bases. The provision for income taxes is comprised of the current tax liability and the changes in deferred tax assets and liabilities. The Company establishes a valuation allowance to the extent that it is more likely than not that deferred tax assets will not be recoverable against future taxable income.

The Company recognizes the effect of uncertain income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount that is greater than 50% likely of being realized. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs.

Fair value measurements

The carrying amounts of cash and cash equivalents, accounts receivable, inventory, prepaid expenses and other current assets, accounts payable, accrued expenses, and deferred rent approximate fair value due to the short-term nature of these instruments. The carrying value of short and long-term debt, and lease liabilities also approximates fair value since these instruments bear market rates of interest or are calculated using market rates of interest. None of these instruments are held for trading purposes.

Fair value is defined as an exit price, representing the amount that would be received upon the sale of an asset or payment to transfer a liability in an orderly transaction between market participants. Fair value is a market-based measurement that is determined based on assumptions that market participants would use in pricing an asset or liability. A three-tier far value hierarchy is used to prioritize the inputs in measuring fair value as follows:

Level 1. Quoted prices in active markets for identical assets or liabilities.

Level 2. Quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, or other inputs that are observable, either directly or indirectly.

Level 3. Significant unobservable inputs that cannot be corroborated by market data.

The asset or liability's fair value measurement within the fair value hierarchy is based upon the lowest level of any input that is significant to the fair value measurement.

There are no assets or liabilities that are measured at fair value on a recurring basis at December 31, 2019 or December 31, 2018.

Stock-based compensation

The Company recognizes compensation expense for stock-based compensation in accordance with ASC 718 "Compensation – Stock Compensation." For employee stock-based awards, the Company calculates the fair value of the award on the date of grant using the Black-Scholes-Merton method for stock options; the expense is recognized over the service period for awards to vest.

The estimation of stock-based awards that will ultimately vest requires judgment and to the extent actual results or updated estimates differ from the original estimates, such amounts are recorded as a cumulative adjustment in the period estimates are revised.

Net loss per share

Basic net loss per share is computed by dividing net loss by the weighted average number of vested shares outstanding during the period. Diluted net loss per share is computed by giving effect to all potential dilutive common securities, including convertible notes, options and warrants. Potential dilutive common shares include the dilutive effect of the common stock underlying in-the-money stock options and is calculated based on the average share price for each period using the treasury stock method. Under the treasury stock method, the exercise price of an option and the average amount of compensation cost, if any, for future services that the Company has not yet recognized when the option is exercised, are assumed to be used to repurchase shares in the current period.

For all periods presented in this report, convertible notes, stock options, and warrants were not included in the computation of diluted net loss per share because such inclusion would have had an antidilutive effect.

Excluded potentially dilutive securities (1):	Year Ended December 31, 2019	2018
Convertible note - principal	—	702,247
Options to purchase common stock	3,463,692	1,694,068
Unvested restricted stock	259,792	96,623
Financing warrants to purchase common stock	4,805,747	2,340,828
Total potential dilutive securities	8,529,231	4,833,766

(1) The number of shares is based on the maximum number of shares issuable on exercise or conversion of the related securities as of the period end. Such amounts have not been adjusted for the treasury stock method or weighted average outstanding calculations as required if the securities were dilutive.

Segment and Geographic Information

Operating segments are defined as components of an enterprise engaging in business activities for which discrete financial information is available and regularly reviewed by the chief operating decision maker in deciding how to allocate resources and in assessing performance. The Company views its operations and manages its business in one operating segment, and the Company operates in only one geographic segment.

Concentration of Credit Risk

Revenues from the following customers each represented at least 10% of total revenue for the years ended December 31, 2019 and December 31, 2018. Clarios represented all or a significant majority of our accounts receivable (trade) balance as of December 31, 2019 and December 31, 2018.

	Revenue		Accounts Receivable (Trade) As of December 31,	
	2019	2018	2019	2018
Clarios (successor of Johnson Controls Battery Group, Inc.)	69 %	88 %	100 %	95 %
P. Kay Metals	28 %	— %	— %	— %

Substantially all of the chemicals used in our refining process are provided by one supplier and supply of used lead acid batteries has, during 2019 and 2018, been provided by two vendors as indicated below.

	2019	2018
Supplier A	69 %	32 %
Supplier B	30 %	64 %

Recently adopted accounting guidance

In February 2016, the FASB issued ASU 2016-02 - Leases (ASC 842), which sets out the principles for the recognition, measurement, presentation and disclosure of leases for both parties to a contract (i.e. lessees and lessors). The new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease, respectively. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 months or less will be accounted for similar to existing guidance for operating leases today. ASC 842 supersedes the previous leases standard, ASC 840 Leases. The standard has been adopted as of January 1, 2019. The new standard requires a modified retrospective transition approach for all leases existing at, or entered into after, the date of initial application, with an option to use certain transition relief. In July 2018, the FASB issued ASU No. 2018-11, Leases (Topic 842): Targeted Improvements, which amends ASC Topic 842 to provide another transition method, allowing a cumulative effect adjustment to the opening balance of retained earnings during the period of adoption. The Company hastwo longer term office leases andone equipment finance lease. The adoption of ASU 2016-02 on January 1, 2019 resulted in the recognition of right-of-use assets of approximately $1.6 million and lease liabilities for operating leases of approximately $1.8 million. See Note 13 for further information regarding the impact of the adoption of ASU 2016-02 on the Company's financial statements.

Recent accounting pronouncements

There were no other recent accounting pronouncements or changes in accounting pronouncements during the year ended December 31, 2019 that are of significance or potential significance to the Company.

3. Revenue recognition

The Company generates revenues by recycling lead acid batteries ("LABs") and selling the recovered lead to its customers. Primary components of the recycling process include sales of recycled lead consisting of lead compounds, ingoted hard lead and ingoted AquaRefined lead as well as plastics. The Company commenced the shipment of products for sale, consisting of lead compounds and plastics, in April 2017, and through March 31, 2018, all revenue was derived from the sale of lead compounds and plastics. In April 2018, the Company began shipping lead bullion in addition to lead compounds and plastics. In June 2018, the Company began shipping high purity lead from its AquaRefining process.

Revenue from products transferred to customers at a single point in time with the delivery of the Company's products to customers accounted for100% of our revenue during the years ended December 31, 2019 and December 31, 2018.

4. Inventory, net

Inventory consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Finished goods	$ 47	$ 43
Work in process	322	164
Raw materials	888	558
	$ 1,257	$ 765

5. Property and equipment, net

Property and equipment, net, consisted of the following (in thousands):

Asset Class	Useful Life (Years)	December 31, 2019	December 31, 2018
Operational equipment	3-10	$ 12,094	$ 15,926
Lab equipment	5	525	698
Computer equipment	3	221	201
Office furniture and equipment	3	221	336
Land	—	1,047	1,047
Building	39	19,508	24,820
Asset retirement cost	20	670	670
Equipment under construction		9,921	7,892
		44,207	51,590
Less: accumulated depreciation		(6,564)	(6,042)
		$ 37,643	$ 45,548

Depreciation expense was $3.5 million and $3.2 million for the years ended December 31, 2019 and December 31, 2018, respectively. The building is a 136,750 square foot lead acid battery recycling plant built in McCarran, Nevada. Equipment under construction is comprised of various components being manufactured or installed by the Company, to be used in the McCarran, Nevada recycling plant.

The Company has financed certain equipment purchases through the use of capital leases. The lease terms are generally between 24 and 36 months with an option to purchase the asset at the end of the lease for $1. Total equipment included in the above table, subject to capital leases, is immaterial to our consolidated financial statements at December 31, 2019. Total equipment included in the above table at December 31, 2018 subject to capital leases is $0.4 million less accumulated depreciation of $0.2 million, resulting in net fixed assets under capital lease of $0.2 million. These assets are depreciated using the same useful lives as noted above and included in depreciation expense.

On November 29, 2019, there was a fire in the AquaRefining area of the plant. As a result of the fire, the company wrote off approximately $22.4 million of fixed assets that were damaged. These assets consisted of operational equipment, building and equipment under construction. The disposal of the fire damaged fixed assets included a decrease of accumulated depreciation of $2.5 million. The net write-off of fixed assets totaled $19.9 million.

6. Intellectual Property

Intellectual property, net, is comprised of the following (in thousands):

	2019	2018
Intellectual property	$ 1,794	$ 1,906
Accumulated amortization	(795)	(635)
Intellectual property, net	$ 999	$ 1,271

Aggregate amortization expense for the years ended December 31, 2019 and December 31, 2018 was $0.2 million.

Estimated future amortization is as follows as of December 31, 2019 (in thousands):

2020	$	179
2021		179
2022		179
2023		179
2024		135
Thereafter		148
Total estimated future amortization	$	999

7. Other Assets

Other assets consist of the following (in thousands).

	December 31,	
	2019	2018
Alameda and Nevada facilities Right of Use Assets (1)	1,197	—
CD for Green Bank collateral security (2)	1,034	1,026
Equipment Deposits	254	—
Facility Closure Trust deposit (3)	670	670
Other assets	154	104
Total Other assets, non-current	$ 3,309	$ 1,800

(1) See Footnote 13.

(2) The $1.0 million certificate of deposit is held by Green Bank as collateral for the Green Bank note payable balance. The deposit with Green Bank will be released after TRIC has three consecutive months of positive cash flow from operations.

(3) The Company has entered into a Facility Closure Trust Agreement for the benefit of the Nevada Division of Conservation and Natural Resources (NDEP). Funds deposited in the Trust are to be available when and if needed for closure and/or post-closure care of the facility related to potential decontamination and hazardous material cleanup. The Trustee will reimburse the Company or other persons as specified by the NDEP from the fund for closure and post-closure expenditures in such amounts as the NDEP shall direct in writing. In addition, the Trustee shall refund to the Company such amounts as the NDEP specifies in writing. $100,000 was deposited upon establishment of the Trust Fund on October 31, 2016; $350,000 was deposited on October 31, 2017; and $220,000 was deposited on October 31, 2018.

8. Accrued liabilities

Accrued liabilities consist of the following (in thousands):

	December 31,	
	2019	2018
Property and equipment related	$ 1,146	$ 218
Payroll related	1,807	2,115
Use tax accrual	23	2
Professional services	879	159
Key man penalty accrual	—	2,500
Other	278	202
	$ 4,133	$ 5,196

9. Asset Retirement Obligation

ASC Topic 410-20, "Asset Retirement and Environmental Obligations, Asset Retirement Obligations" requires the recording of a liability in the period in which an asset retirement obligation (ARO) is incurred, in an amount equal to the discounted estimated fair value of the obligation that is capitalized. In each subsequent fiscal quarter, this liability is accreted up to the final retirement cost. The determination of the ARO is based on an estimate of the future cost to remove and decontaminate the Company's facility at TRIC upon closure. The estimated fair value of the closure costs is based on vendor quotes to remove and decontaminate the McCarran facility in accordance with the Company's closure plan as filed with the State of Nevada in its "Application for the Recycling of Hazardous Waste, by Written Determination" in 2016. The actual costs could be higher or lower than current estimates. The discounted estimated fair value of the closure costs was $0.7 million and the obligation was recorded as of March 31, 2017, when the obligation was deemed to have occurred. Offsetting this ARO is, as noted in Note 5 above, an asset retirement cost of the same amount that was capitalized. Accretion of the ARO for the years ended December 31, 2019 and December 31, 2018 was $46,000 and $44,000 respectively.

The Company entered into a facility closure trust agreement in October 2017 for the benefit of the Nevada Division of Environmental Protection (NDEP), an agency of the Nevada Division of Conservation and Natural Resources. Funds deposited in the trust are to be available, when and if needed, for potential decontamination and hazardous material cleanup in connection with the closure and/or post-closure care of the facility. The trustee will reimburse the Company or other persons as specified by the NDEP from the fund for closure and post-closure expenditures in such amounts as the NDEP shall direct in writing. Through December 31, 2019, $670,000 has been contributed to the trust fund.

10. Convertible Notes

The convertible note payable with Interstate Battery Systems International, Inc. (Interstate Battery) was comprised of the following (in thousands):

	December 31,	
	2019	2018
Convertible note payable	$ —	$ 5,000
Accrued interest	—	1,651
Deferred financing costs, net	—	(20)
Note discount	—	(2,556)
Less current portion	$ —	$ 4,075
Convertible note payable, non-current portion	$ —	$ —

The convertible note payable bore interest at 11% per annum and was due May 24, 2019. The original note discount was calculated as the allocated fair value of the warrants issued in connection with the transaction, which included the issuance of common stock, warrants and the convertible note, as well as the allocated fair value of the embedded conversion feature, subject to limitations on the absolute amount of discount attributable to the convertible notes and its allocated value. The discount was amortized using the effective interest method over the three-year term of the note, maturing on May 24, 2019.

On January 24, 2019, the Company repaid Interstate Battery the outstanding principal and interest on the convertible debt in the amount of $5.7 million. In connection with the payoff, the Company amortized the remaining discount on the note of $2.6 million and remaining deferred financing expenses of $20,000 to interest expense.

11. Deferred Rent

On August 7, 2015, the Company signed a lease for 21,697 square feet of mixed office and manufacturing space in Alameda, CA. The term of the lease is 76 months plus 6 months pre-commencement date for tenant improvement construction. The total cost of the lease is $3.0 million which was being amortized over 82 months at approximately $37,000 per month. As of December 31, 2016, the landlord had paid for $0.9 million in tenant improvements. The tenant improvements cost has been included in owned assets and deferred rent and was being amortized over the life of the lease.

In July 2018, the Company signed a lease for 14,016 square feet of mixed office and warehouse space in McCarran, Nevada. The lease term is 42 months. The total cost of the lease is $0.4 million, which is being amortized over 42 months at approximately $9,000 per month.

Amortization of deferred rent expense for the years ended December 31, 2019 and December 31, 2018 was $0.04 million and $0.1 million, respectively.

In October 2018, the Company moved its corporate headquarters to its McCarran, Nevada facility and ceased to use its Alameda, California facility. In February 2019, the Company sublet the California facility. Upon vacating the property, the Company wrote off the remaining amount of deferred rent in the amount of $0.8 million, and recorded a liability for the present value of remaining lease payments less estimated sublease income in the amount of $0.3 million recorded in the balance sheet as lease liability. Additionally, the Company wrote off the net book value of its leasehold improvements of approximately $0.8 million during the fourth quarter of 2018.

12. Notes Payable

Aqua Metals Reno, Inc. (“AMR”), a subsidiary of Aqua Metals Inc., entered into a $10,000,000 loan with Green Bank on November 3, 2015. The term of the loan is twenty-one years. During the first twelve months, only interest was payable and thereafter monthly payments of interest and principal are due. The interest rate adjusts on the first day of each calendar quarter to the greater of six percent (6%) or two percent (2%) per annum above the minimum prime lending rate charged by large U.S. money center commercial banks as published in the Wall Street Journal. The terms of the Loan Agreement contain various affirmative and negative covenants. Among them, AMR must maintain a minimum debt service coverage ratio of 1.25 to 1.0 (beginning with the twelve-month period ending March 31, 2017), a maximum debt-to-net worth ratio of 1.0 to 1.0 and a minimum current ratio of 1.5 to 1.0. AMR was in compliance with all but the minimum debt service coverage ratio covenant as of and for each of the calendar quarters in the period March 31, 2017 through December 31, 2019. AMR has received a waiver for the minimum debt service coverage ratio covenant for each of the aforementioned calendar quarters.

The net proceeds of the loan were used for the construction of the Company’s lead acid recycling operation in McCarran, Nevada. Collateral for this loan is AMR’s accounts receivable, goods, equipment, fixtures, inventory, accessions and a certificate of deposit in the amount of $1,000,000. The certificate of deposit is reported in "Other Assets" in the condensed consolidated balance sheet.

The loan is guaranteed by the United States Department of Agriculture Rural Development (“USDA”), in the amount of 90% of the principal amount of the loan. The Company paid a guarantee fee to the USDA in the amount of $270,000 at the time of closing and is required to pay to the USDA an annual fee in the amount of 0.50% of the guaranteed portion of the outstanding principal balance of the loan as of December 31 of each year.

The costs associated with obtaining the Green Bank loan were recorded as a reduction to the carrying amount of the note and are being amortized as interest expense within the condensed consolidated statements of operations over the twenty-one year life of the loan.

Notes payable is comprised of the following (in thousands):

	December 31, 2019	December 31, 2018
Notes payable, current portion		
Capital equipment leases, current portion	$ —	$ 16
Green Bank, net of issuance costs	296	295
	$ 296	$ 311
Notes payable, non-current portion		
Capital equipment leases, non-current portion	$ —	$ 31
Green Bank, net of issuance costs	8,404	8,569
	$ 8,404	$ 8,600

The costs associated with obtaining the Green Bank loan of $0.8 million were recorded as a reduction to the carrying amount of the note and are being amortized as interest expense over the twenty-one year life of the loan. Amortization of the deferred financing costs was $36,000 and $35,000 for the years ended December 31, 2019 and December 31, 2018, respectively. The principal payments detailed below are excluding the effect of the reduction in the carrying amount related to the deferred financing costs.

The future principal payments related to the Green Bank note obligations are as follows as of December 31, 2019 (in thousands):

2020	$ 296
2021	320
2022	343
2023	368
2024	394
Thereafter	7,585
Total loan payments	$ 9,306

13. Leases

The Company currently maintains one finance lease for equipment and two operating leases for real estate. Our finance lease is immaterial to our consolidated financial statements. Our operating leases have terms of 76 and 42 months and include one or more options to extend the duration of the agreements. These operating leases are included in "Other assets" on the Company's December 31, 2019 consolidated balance sheet and represent the Company's right to use the underlying assets for the term of the leases. The Company's obligation to make lease payments are included in "Lease liability, current portion" and "Lease liability, non-current portion" on the Company's December 31, 2019 consolidated balance sheet. The Company recognized sublease income for the twelve months ended December 31, 2019. The Company did not recognize any sublease income during the twelve months ended December 31, 2018.

Based on the present value of the lease payments for the remaining lease term of the Company's existing leases, as of December 31, 2019, total right-of-use assets were approximately $1.20 million and operating lease liabilities were approximately $1.38 million. The right-of-use assets are reported in "Other Assets" in the condensed consolidated balance sheet.

Information related to the Company's right-of-use assets and related lease liabilities were as follows (in thousands):

		Twelve Months Ended December 31, 2019
Cash paid for operating lease liabilities	$	624
Operating lease cost	$	577

	December 31, 2019
Weighted-average remaining lease term	2.2 Years
Weighted-average discount rate	9.66 %

Maturities of lease liabilities as of December 31, 2019 were as follows (in thousands):

Due in 12-month period ended December 31,		
2020	$	642
2021	$	661
2022	$	227
	$	1,530
Less imputed interest	$	(148)
Total lease liabilities	$	1,382
Current operating lease liabilities	$	546
Non-current operating lease liabilities	$	836
	$	1,382

Note: Excludes a finance lease with current liability of $ 6 and a non-current liability of $ 25.

14. Stockholders' Equity

Authorized capital

The authorized capital stock of the Company consists of 100,000,000 shares of common stock, par value $0.001 per share. In the event of liquidation of the Company, dissolution or winding up, the holders of common stock are entitled to share ratably in all assets remaining after payment of liabilities. The common stock has no preemptive or conversion rights or other subscription rights. There are no redemption or sinking fund provisions applicable to the common stock. The outstanding shares of common stock are fully paid and non-assessable.

The holders of the Company's common stock are entitled to one vote per share. Holders of common stock are entitled to receive a ratable share of dividends, if any, as may be declared by the board of directors.

Interstate Battery Agreements

Investment Agreement

The Company entered into a Credit Agreement dated May 18, 2016 with Interstate Battery pursuant to which Interstate Battery loaned the Company $5.0 million in consideration of the Company's issuance of a secured convertible promissory note in the original principal amount of $5.0 million. The note bore interest at the rate of eleven percent (11%) per annum, compounding monthly, and all interest was payable upon the earlier of maturity or conversion of the principal amount. The loan was to mature on May 24, 2019. The outstanding principal was convertible into shares of the Company's common stock at a conversion price of $7.12 per share. The Company's obligations under the note and Credit Agreement were secured by a second priority lien on the real estate, fixtures and equipment at the Company's recycling facility at McCarran, Nevada. The Credit

Agreement included representations, warranties, and affirmative and negative covenants that are customary of institutional credit agreements. Interstate Battery had previously raised a claim that the Company was in technical breach of a negative covenant under loan. The claimed breach related to the Company's failure to obtain Interstate Battery's prior written consent to the Company's acquisition of Ebonex IPR, Ltd. The Company estimated in 2017 that resolving the claim would result in a charge of $0.6 million. The Company recorded the $0.6 million in general and administrative expenses as of December 31, 2017 with the offset in accrued liabilities. The Company resolved this alleged breach in connection with a series of agreements with Interstate Battery in June 2018.

On January 24, 2019, the Company repaid Interstate Battery the outstanding principal and interest on the convertible debt in the amount of $6.7 million. In connection with the payoff, the Company amortized the remaining discount on the note of $2.6 million and remaining deferred financing expenses of $20,000 to interest expense.

Pursuant to the Credit Agreement, the Company also issued to Interstate Battery two common stock purchase warrants, including:

- a warrant to purchase 702,247 shares of the Company's common stock, at an exercise price of $7.12 per share, that was initially exercisable upon grant and initially expired on May 24, 2018; and
- a warrant to purchase 1,605,131 shares of the Company's common stock, at an exercise price of $9.00 per share, that is exercisable commencing November 24, 2016 and expired on May 24, 2019.

The warrants contain cashless exercise and standard anti-dilution adjustment provisions. The first warrant issued was modified in June 2018 to extend the expiration date to June 30, 2020 and reduced the exercise price to $3.33 per share. If Interstate converts its convertible note and exercises both warrants in their entirety, it will own approximately 8.3% of the Company's common stock at an average price per share of approximately $7.22.

The Company also entered into a Stock Purchase Agreement dated May 18, 2016 with Interstate Battery pursuant to which the Company issued and sold to Interstate Battery 702,247 shares of the Company's common stock at $7.12 per share for gross proceeds of approximately $5.0 million. The Stock Purchase Agreement includes customary representations, warranties, and covenants by Interstate Battery and us, and an indemnity from us in favor of Interstate Battery.

In connection with the investment transactions, the Company also entered into an Investors Rights Agreement dated May 18, 2016 with Interstate Battery pursuant to which the Company granted Interstate Battery customary demand and piggyback registration rights, limited board observation rights over the next three years and limited preemptive rights allowing Interstate Battery the right to purchase its proportional share of certain future equity issuances by the Company over the next three years. The Company included all of the Interstate Battery shares in its S-3 Registration Statement filed with the Securities and Exchange Commission on August 1, 2016.

The investment transactions with Interstate Battery closed on May 24, 2016. There were no sales commissions paid by the Company in connection with its sale of securities to Interstate Battery.

The Company allocated the $10.0 million proceeds from the Credit Agreement and Stock Purchase Agreement, to the various securities based on their relative fair values on the closing date of May 24, 2016.

- The fair value of the note was calculated using an average of the Merrill Lynch US High Yield CCC rate of 16.21% on May 24, 2016 and the Merrill Lynch US High Yield B effective yield of 7.44% on May 24, 2016.
- The fair value of the common stock was based on the closing market price of the Company's common stock on the NASDAQ stock market on May 24, 2016.

The fair value of the warrants using the Black-Scholes-Merton option pricing model and the assumptions are listed in the table below (FV of warrant in thousands).

	Warrant #1	Warrant #2
Warrant shares issued	702,247	1,605,131
Market price	$ 11.39	$ 11.39
Exercise price	$ 7.12	$ 9.00
Term (years)	2 years	3 years
Risk-free interest rate	0.91 %	1.05 %
Volatility	65.70 %	67.80 %
Dividend rate	— %	— %
Per share FV of warrant	$ 5.89	$ 5.89
FV of warrant	$ 4,136	$ 9,450

Both warrants were issued on May 24, 2016, when the closing market price of the Company's stock was $11.39.
The table below presents the allocation of the proceeds based on the relative fair values of the stock, warrants and note (in thousands).

	Fair value	Allocated value
Allocation of Proceeds		
Convertible note	$ 4,879	$ 1,844
Warrants	13,586	5,134
Common stock	7,998	3,022
	$ 26,463	$ 10,000

The difference between the face value of the convertible note and the allocated amount (which considers both the allocated fair value of the issued stock and allocated fair value of the warrants) was recorded as an initial discount to the convertible note; common stock was recorded at its allocated fair value as a credit to par value and additional paid-in capital as appropriate, based on the number of shares issued, and the allocated fair value of the warrant was credited to additional paid-in capital. After taking into consideration the amortization of the note discount, the effective interest rate on the convertible note is 184.75% per annum.

The convertible note includes an embedded BCF. The intrinsic value of the BCF was treated as an additional component of the discount attributable to the convertible note. The initial discount (attributable to the stock and warrants as noted above) and the discount attributable to the BCF exceeds the face amount of the convertible note. To avoid reducing the initial net carrying value of the convertible note to or below zero, the discount attributable to the BCF was limited such that the aggregate of all discounts does not exceed 99.5% of the face amount of the convertible note. The discount is being accreted to interest expense using the effective interest method over the three-year life of the loan. If the loan is converted prior to its maturity, any remaining discount will be expensed immediately.

Costs incurred in connection with the deal of $771,000 were allocated between additional paid-in capital and prepaid financing/ debt discount ("debt issuance costs") in the same manner as the above allocation of proceeds. The allocated debt issuance costs of $142,000 were recorded as a reduction to the carrying amount of the convertible note and are being amortized as interest expense over the three-year life of the loan. The remaining $629,000 was recorded as a reduction to additional paid-in capital.

Clarios agreement

On February 7, 2017, the Company entered into a Stock Purchase Agreement with Clarios pursuant to which the Company issued and sold to a wholly-owned subsidiary of Johnson Controls International plc, ("Johnson Controls"), 939,005 shares of its common stock at $11.33 per share for gross proceeds of approximately $10.6 million. Costs incurred in connection with the transaction, primarily legal fees, totaled approximately $167,000. The Stock Purchase Agreement includes customary representations, warranties, and covenants by Johnson Controls and the Company, and an indemnity from the Company in favor of Johnson Controls.

In connection with the investment transactions, the Company also entered into an Investors Rights Agreement dated February 7, 2017 with Johnson Controls pursuant to which the Company granted Johnson Controls customary demand and piggyback registration rights, limited board observation rights and limited preemptive rights allowing Johnson Controls the right to purchase its proportional share of certain future equity issuances by the Company. The board observation and preemptive rights shall expire on the earlier of (i) such time as Johnson Controls no longer owns 50% of the acquired shares or (ii) the termination of both the Tolling/Lead Purchase Agreement and Equipment Supply Agreement.

There were no sales commissions paid by the Company in connection with the sale of its common shares to Johnson Controls.

Veolia Agreement

On February 26, 2019, the Company signed a contract with Veolia North America Regeneration Services LLC ("Veolia") to provide operations, maintenance and management services at Aqua Metals' AquaRefining facility in McCarran, Nevada. Pursuant to the agreement, Veolia contributes operational and technological expertise and organizational capabilities in aqueous-based process chemistries and electrolysis along with assumption of responsibility for operations, supply chain, offtake and management of the plant. Veolia employees began working onsite starting March 4, 2019 at the McCarran facility.

In consideration of the services to be provided by Veolia under the agreement, we agreed to issue to Veolia a total of 2,350,000 shares of our common stock in eight quarterly installments of 293,750 shares. We also agreed to issue to Veolia, on the one-year anniversary of the agreement, warrants to purchase an additional 2,000,000 shares of our common stock at an exercise price of $5.00 per share and, on the second anniversary of the agreement, warrants to purchase an additional 2,000,000 shares of our common stock at an exercise price $7.00 per share. The warrants will have a term of ten years from the date of issuance.

During the year ended December 31, 2019, the Company issued 1,184,985 shares of common stock valued at $3.6 million to Veolia North America Regeneration Services, LLC pursuant to the Operations, Maintenance and Management Agreement between Veolia and the Company. As a result of the November 2019 fire at the McCarran facility, the Company has declared a force majeure event under the Agreement and suspended all further issuance of common stock.

2018 Public Offering

On June 18, 2018, the Company completed a public offering of 10,085,500 shares of its common stock, at the price of $2.85 per share, for gross proceeds of $28.7 million. After the payment of underwriter discounts and offering expenses, the Company received net proceeds of approximately $26.6 million.

2019 Public Offerings

On January 22, 2019, the Company completed a public offering of 5,175,000 shares of its common stock, at the price of $1.90 per share, for gross proceeds of $9.8 million. After the payment of underwriter discounts and offering expenses, the Company received net proceeds of approximately $9.1 million.

On May 14, 2019, the Company completed a public offering of 11,000,000 shares of its common stock, at the price of $2.00 per share, for gross proceeds of $22 million. After the payment of underwriter discounts and offering expenses, the Company received net proceeds of approximately $20.3 million.

Other shares issued

In January 2018, an overallotment related to a 2017 public offering was exercised resulting in 1,072,500 shares being issued and net proceeds of approximately $2.1 million.

The Company issued 65,600 shares of common stock upon vesting of Restricted Stock Units during the year ended December 31, 2018. Additionally, the Company issued 2,034 shares of common stock pursuant to the Officers and Directors Purchase Plan during the year ended December 31, 2018 for proceeds of $4,000.

The Company issued 152,727 shares of common stock in conjunction with consulting agreements during the fourth quarter of 2018 with a fair value of $0.4 million. Fair value was determined using the intrinsic value method: total number of shares issued under the consulting contract multiplied by the closing market price of the date of issuance.

During the year ended December 31, 2019, the Company issued 533,655 shares of common stock upon vesting of Restricted Stock Units granted by the Company.

During the year ended December 31, 2019, the Company issued 202,905 shares of common stock upon vesting of Restricted Stock Units granted to Board members.

During the year ended December 31, 2019, the Company issued 161,362 shares of common stock to prior Company executives to fulfill obligations related to separation agreements and other consulting services.

During the year ended December 31, 2019, the Company issued 807,436 shares of common stock valued at $1.3 million to Clarios pursuant to the Clarios Investor Rights Agreement dated February 7, 2017 between Clarios and the Company.

Warrants issued

In January 2019, the Company issued a warrant to purchase 103,500 shares of the Company's common stock to the underwriter of the Company's January 22, 2019 public offering, equal to 2% of the 5,175,000 shares sold. The warrant is exercisable at $1.90 per share (100% of the price of the common stock sold in the offering), commencing the later of six months after January 22, 2019 or such time as the Company amends its charter to increase its authorized shares of common stock. The warrant will expire on January 22, 2024.

Pursuant to the Operations, Maintenance and Management Agreement dated February 26, 2019, the Company has agreed to issue to Veolia, on the one-year anniversary of the Agreement, warrants to purchase 2,000,000 shares of its common stock at an exercise price of $5.00 per share and, on the second anniversary of the Agreement, warrants to purchase an additional 2,000,000 shares of its common stock at an exercise price $7.00 per share. The warrants will have a term of ten years from the date of issuance. The warrants were valued as of the agreement date using the Black-Scholes-Merton pricing model. The value of the warrants is being amortized over the applicable period until the warrants are issued.

The following assumptions were used in the Black-Scholes-Merton pricing model to estimate the fair value of the warrants (FV of warrants in thousands).

	Veolia Warrant #1	Veolia Warrant #2	Jan. 2019 Offering Underwriter
Warrant shares issued	2,000,000	2,000,000	103,500
Market price	$ 3.02	$ 3.02	$ 2.16
Exercise price	$ 5.00	$ 7.00	$ 1.90
Term (years)	10	10	5
Risk-free interest rate	2.64 %	2.64 %	2.57 %
Volatility	81.50 %	81.50 %	81.00 %
Dividend rate	— %	— %	— %
Per share FV of warrant	$ 2.35	$ 2.24	$ 1.47
FV of warrant	$ 4,699	$ 4,474	$ 152

The fair value of each of the warrants was recorded as increase to business development and management costs and increase in additional paid in-capital.

As noted in the preceding section, warrants to purchase 2,307,378 and 33,450 shares of the Company's common stock were also issued for the Interstate Battery deal and the November 2016 Public Offering, respectively, during 2016. Please refer to the above section for specific valuation assumptions for these warrants.

Warrant modification

On June 24, 2018, the Company entered into a series of agreements with Interstate Battery, which modified the terms of a warrant to purchase 702,247 shares of our common stock by reducing the exercise price of the warrant from $7.12 per share to $3.33 per share and extended the expiration date of the warrant from June 24, 2018 to June 23, 2020. The expiration date had previously been extended from May 2018 to June 2018 as part of the overall negotiations. The incremental fair value resulting from this modification was calculated to be $1.0 million using the Black-Scholes-Merton Option Pricing Model with the assumptions as follows: $3.26 per share fair value on the date of modification; 2-year term; 80.2% volatility; 2.56% discount rate and 0% annual dividend rate.

The Company previously recorded $0.6 million in general and administrative expense during the year ended December 31, 2017 with the offset in accrued liabilities as an estimate of this liability. Upon modification, the Company recorded an additional $4 million in general and administrative expense for the three months ended June 30, 2018 and relieved $0.6 million in accrued liabilities with the $1.0 million offset to additional paid-in capital.

Warrants outstanding

Warrants outstanding to purchase shares of the Company's common stock at a weighted average exercise price of $5.52 per share are as follows.

Exercise Price per Share		Expiration Date	Shares Subject to Purchase at December 31, 2019
$	3.33	2020-06-23	702,247
$	1.90	2024-01-22	103,500
$	5.00	2030-02-28	2,000,000
$	7.00	2031-02-28	2,000,000
			4,805,747

Stock-based compensation

In 2014, the Board of Directors adopted the Company's stock incentive plan (the "2014 Plan"). The 2014 Plan was most recently amended and restated effective as of the Company's 2017 Annual Stockholders' Meeting. A total of 2,113,637 shares of common stock was authorized for issuance pursuant to the 2014 Plan at the time of its most recent amendment and restatement in 2017. The 2014 Plan provides for the following types of stock-based awards: incentive stock options; non-statutory stock options; restricted stock; and performance stock. The 2014 Plan, under which equity incentives may be granted to employees and directors under incentive and non-statutory agreements, requires that the option price may not be less than the fair value of the stock at the date the option is granted. Option awards are exercisable until their expiration, which may not exceed 10 years from the grant date.

In 2019, the Board of Directors adopted the Company's stock incentive plan (the "2019 Plan"). A total of 4,500,000 shares of common stock was authorized for issuance pursuant to the 2019 Plan. The 2019 Plan provides for the following types of stock-based awards: incentive stock options; non-statutory stock options; restricted stock; and performance stock. The 2019 Plan, under which equity incentives may be granted to employees and directors under incentive and non-statutory agreements, requires that the option price may not be less than the fair value of the stock at the date the option is granted. Option awards are exercisable until their expiration, which may not exceed 10 years from the grant date.

Stock-based compensation expense recorded was allocated as follows (in thousands):

	Year ended December 31,			
		2019		2018
Cost of product sales	$	357	$	154
Research and development cost		200		215
General and administrative expense		3,649		832
Total	$	4,206	$	1,201

The following assumptions were used in the Black-Scholes-Merton option pricing model to estimate the fair value of the awards granted during the year ended December 31, 2019 and December 31, 2018.

	Year ended December 31,	
	2019	2018
Expected stock volatility	82.2% - 87.5%	76.9% - 86.3%
Risk free interest rate	1.7% - 2.6%	2.1% - 3.0%
Expected years until exercise	1.0-4.0	2.5-3.5
Dividend yield	— %	— %

The risk-free interest rate assumption was based on the United States Treasury's zero-coupon bonds with maturities similar to those of the expected term of the award being valued. The assumed dividend yield was based on the Company's expectation of not paying dividends in the foreseeable future. The weighted-average expected life of the options was calculated using the simplified method as prescribed by the Securities and Exchange Commission ("SEC") Staff Accounting Bulletin No. 107 and No. 110 ("SAB No. 107 and 110"). This decision was based on the lack of relevant historical data due to the Company's limited historical experience. In addition, due to the Company's limited historical data, the estimated volatility also reflects the application of SAB No. 107 and 110, using the weighted average of the Company's historical volatility and the historical volatility of several unrelated public companies within the recycling industry. Forfeitures are recognized as they occur.

The following table summarizes the stock-based compensation plan activity and related information through December 31, 2019.

		Options Outstanding		RSUs Outstanding	
	Number of Shares Available for Grant	Number of Shares	Weighted-Average Exercise Price Per Share	Number of RSUs	Weighted-Average Grant Date Fair Value Per Share
Balance at December 31, 2017	1,065,003	578,813	$ 6.51	180,951	$ 7.40
Granted	(640,275)	1,269,925	3.99	207,623	2.42
Exercised/ Released	—	—	—	(65,600)	5.78
Forfeited	381,021	(154,670)	7.00	(226,351)	4.74
Balance at December 31, 2018	805,749	1,694,068	$ 4.57	96,623	$ 4.01
Authorized	4,500,000				
Granted	(3,468,296)	2,197,074	3.19	1,271,222	1.52
Exercised/ Released	—	—	—	(970,630)	1.63
Forfeited	564,873	(427,450)	4.46	(137,423)	1.85
Balance at December 31, 2019	2,402,326	3,463,692	$ 3.71	259,792	$ 1.83

The number of options granted during 2018 includes840,000 options subject to the terms and conditions of the Company's Amended and Restated 2014 Stock Incentive Plan ("2014 Plan) but were not issued under the 2014 Plan in reliance on Nasdaq Rule 5635(c)(4) and therefore does not reduce the number of shares available under the 2014 Plan.

The weighted-average grant-date fair value of options granted during the years ended December 31, 2019 and December 31, 2018 was $.49 and $1.71 per share, respectively. There were no stock option exercises during the years ended December 31, 2019 and December 31, 2018.

Additional information related to the status of options at December 31, 2019 is as follows:

	Shares	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Contractual Life (Years)	Aggregate Intrinsic Value (in thousands)
Outstanding	3,463,692	$ 3.71	3.44	$ —
Vested and exercisable	1,096,071	$ 3.74	2.28	$ —

The intrinsic value of options is the fair value of the Company's stock at December 31, 2019 less the per share exercise price of the option multiplied by the number of shares.

As of December 31, 2019, there is approximately $2.4 million of total unrecognized compensation cost related to the unvested share-based (option and RSU) compensation arrangements granted under the stock-based compensation plans. The remaining unrecognized compensation cost will be recognized over a weighted-average period of 3.5 years.

The following table summarizes information about stock options outstanding as of December 31, 2019:

	Options Outstanding		Options Exercisable	
Range of Exercise Prices	Number of Shares	Weighted-Average Remaining Contractual Life (Years)	Number of Shares	Weighted-Average Remaining Contractual Life (Years)
$1.60 -$2.93	732,627	3.00	440,330	2.08
$2.94 - $3.00	849,998	3.67	146,832	3.33
$3.01 - $3.95	685,152	3.50	138,819	1.00
$3.96 - $6.92	578,720	4.00	95,553	3.30
$6.93 - $19.20	617,195	3.00	274,537	2.30
	3,463,692	3.44	1,096,071	2.28

Stock option issuances

In January 2019, Stephen Cotton, President and CEO, was awarded options to purchase up to 232,461 shares of the Company's common stock. The options were vested immediately and are exercisable over a five-year period at an exercise price of $1.88 per share.

In January 2019, Judd Merrill, CFO, was awarded options to purchase up to 56,698 shares of the Company's common stock. The options were vested immediately and are exercisable over a five-year period at an exercise price of $1.88 per share.

In February 2019, Stephen Cotton, President and CEO, was awarded options to purchase up to 1.26 million shares of the Company's common stock. Options to purchase 420,000 common shares are exercisable over a five-year period at an exercise price of $3.08 per share. Options to purchase 420,000 common shares are exercisable over a five-year period at an exercise price of $3.68 per share and options to purchase 420,000 common shares are exercisable over a five-year period at an exercise price of $4.18 per share. The options will vest over three years in three equal installments.

In March 2019, Judd Merrill, CFO, was awarded options to purchase up to 250,000 shares of the Company's common stock. Options to purchase 125,000 common shares are exercisable over a five-year period at an exercise price of $3.79 per share. Options to purchase 62,500 common shares are exercisable over a five-year period at an exercise price of $4.39 per share and options to purchase 62,500 common shares are exercisable over a five-year period at an exercise price of $4.89 per share. The options will vest over three years in three equal installments.

In May 2019, the Company awarded options to the Directors to purchase up to 172,915 shares of the Company's common stock. The options vest equally over 12 months and are exercisable over a five-year period at an exercise price of $2.48 per share.

In July 2019, the Company awarded options to purchase up to 150,000 shares of the Company's common stock. The options vest equally over three years and are exercisable over a five-year period at an exercise price of $1.65 per share.

In July 2019, the Company awarded options to purchase up to 50,000 shares of the Company's common stock. The options vest equally over three years and are exercisable over a five-year period at an exercise price of $1.87 per share.

Restricted stock units

In January 2019, the Company granted 263,660 restricted stock units (RSUs), all of which were subject to vesting, with a grant fair value of $490,000 to the employees. The shares vest in six equal semi-annual installments over a three-year period.

In July 2019, the board of directors were granted 60,560 RSUs, all of which were subject to vesting, with a grant fair value of $97,500. The shares fully vest on September 30, 2019.

In August 2019, the Company granted 134,419 RSUs, all of which were subject to vesting, with a grant fair value of $231,000 to the employees. The shares vest in three equal installments over a twelve-month period.

In September 2019, Stephen Cotton, President and CEO, was granted 59,414 RSUs, all of which were subject to vesting, with a grant fair value of $109,000. The shares fully vest on March 20, 2020.

Total intrinsic value of RSUs vested and released during 2019 was $1.9 million. Intrinsic value of RSUs outstanding at December 31, 2019 was $0.2 million.

As of December 31, 2019, there is approximately $0.4 million of total unrecognized compensation cost related to the unvested share-based (RSU) compensation arrangements granted under the stock-based compensation plans. The remaining unrecognized compensation cost will be recognized over a weighted-average period of 3.8 years.

Reserved shares

At December 31, 2019, the Company has reserved shares of common stock for future issuance as follows:

	Number of Shares
Equity Plan	
Subject to outstanding options and restricted shares	3,723,484
Available for future grants	2,402,326
Officer and Director Purchase Plan	245,562
Warrants	4,805,747
	11,177,119

15. Commitments and Contingencies

Executive resignations

On April 19, 2018, Stephen Clarke resigned as president and chief executive officer and as a member of the Board. Dr. Clarke's resignation as an officer of the Company was treated as a termination without cause under his employment agreement with the Company. Pursuant to his employment agreement, Dr. Clarke was entitled to one-time severance benefits that includes severance and benefits continuation expense of approximately $0.9 million paid out over a 2-year period in consideration of his execution of a customary release and separation agreement. Additionally, Dr. Clarke was granted an extension of the exercise period of his stock options upon termination from 90 days to 2 years. The expense related to the modification of these stock option awards was approximately $15,000.

On December 3, 2018, Selwyn Mould resigned as chief operating officer. Mr. Mould's resignation as an officer the Company was treated as a termination without cause under his employment agreement with the Company. Pursuant to his employment agreement, Mr. Mould was entitled to one-time severance benefits that includes severance and benefits continuation expense of approximately $0.9 million paid out over a 2-year period in consideration of his execution of a customary release and separation agreement. Pursuant to a Separation Agreement and Release between the Company and Mr. Mould, Mr. Mould has agreed to receive, in lieu of two years of salary, a cash severance payment of $100,000 payable in six equal installments in accordance with the Company's regular payroll practices, plus an award of restricted stock units that will entitle him to receive, for each of the 21 consecutive months commencing on March 1, 2019, $33,333 of the Company's common shares based on the volume-weighted average price over the 20 trading days preceding the first business day of the respective month. The Company has reserved the right, at its option, to pay Mr. Mould $33,333 of cash in lieu of any of the 21 monthly share issuances. The

Separation Agreement and Release includes customary indemnification, confidentiality, non-disparagement and non-solicitation covenants and agreements of the parties.

Lease commitments

As discussed in Note 13, on August 7, 2015, the Company signed a lease for 21,697 square feet of mixed office and manufacturing space in Alameda, CA. On October 10, 2014, the Company entered into an operating lease for its current Oakland facility which expired in April 2018. The Company entered into a sublease agreement dated February 4, 2019 for the Alameda facility. The term of the sublease commenced on February 4, 2019, and ends on May 31, 2022. Total base rent payable by the sublessee through the end of the term of the sublease is approximately $1.5 million.

In July 2018, the Company signed a lease for 14,016 square feet of mixed office and warehouse space in McCarran, Nevada.

The future minimum payments related to these leases are as follows as of December 31, 2019 (in thousands):

2020	$	642
2021		661
2022		227
Total minimum lease payments	$	1,530

During the years ended December 31, 2019 and December 31, 2018, the Company has incurred total rent expense of $0.6 million and $0.5 million, respectively.

Interstate Battery Agreement commitment

On June 24, 2018, the Company entered into a series of agreements with Interstate Battery, including an amendment to the Investor Rights Agreement. Pursuant to the amendment to the Investor Rights Agreement, Interstate Battery agreed to waive all payments under the key-man provisions of the Investor Rights Agreement with respect to the resignation of the Company's former chief executive officer, Stephen Clarke. In addition, the parties agreed that the Company, at its option, can elect to eliminate the key-man event and all related key-man payments associated with Mr. Mould by (i) paying Interstate Battery a one-time fee of $0.5 million, payable in cash and (ii) agreeing to pay Interstate Battery $2.0 million, payable at the Company's election in cash or shares of its common stock, should the Company's current president, Stephen Cotton, no longer serve as president of the Company during the period ending May 18, 2019.

The Company paid Interstate Battery a one-time fee of $0.5 million on February 20, 2019 related to the key-man provision associated with Mr. Mould's resignation.

Clarios (successor of Johnson Controls) Agreement Commitment

Pursuant to the Clarios Investor Rights Agreement, the Company had agreed to compensate Clarios should either Stephen Clarke, the Company's then current chief executive officer, or Selwyn Mould, the Company's then current chief operating officer, no longer hold such positions or no longer devote substantially all of their business time and attention to the Company, whether as a result of resignation, death, disability or otherwise (such an event referred to as a "key-man event"). The Company has agreed to pay Clarios $1.0 million per occurrence, if either officer is subject to a key-man event during the 18 months following February 7, 2017. The Company also agreed to pay Clarios $1.0 million if either or both key-man events occur after 18 months and prior to 30 months following February 7, 2017. Pursuant to the agreement, if Clarios, in its sole and absolute discretion, agrees with the Company on mutually acceptable replacements for Dr. Clarke and/or Mr. Mould, as the case may be, the key-man penalties shall be deemed waived by Clarios. In connection with the resignations by Dr. Clarke and Mr. Mould described above, Clarios has submitted to the Company its claim for payment of the key-man penalties in the total amount of $2.0 million. We agreed to settle the Clarios Key-man penalty claim through our issuance of 807,436 shares of our common stock, which we issued in June 2019.

Legal proceedings

Beginning on December 15, 2017, three purported class action lawsuits were filed in the United Stated District Court for the Northern District California against us, Stephen Clarke, Thomas Murphy and Mark Weinswig. On March 23, 2018, the cases were consolidated under the caption *In Re: Aqua Metals, Inc. Securities Litigation* Case No 3:17-cv-07142. On May 23, 2018, the Court appointed lead plaintiffs and approved counsel for the lead plaintiffs. On July 20, 2018, the lead plaintiffs filed a consolidated amended complaint ("Amended Complaint"), on behalf of a class of persons who purchased our securities between May 19, 2016 and November 9, 2017, against us, Stephen Clarke, Thomas Murphy and Selwyn Mould. The Amended Complaint alleges the defendants made false and misleading statements concerning our lead recycling operations in violation of Section 10(b) of the Securities Exchange Act of 1934 ("Exchange Act") and Rule 10b-5 promulgated thereunder and seeks to hold the individual defendants as control persons pursuant to Section 20(a) of the Exchange Act. The Amended Complaint also alleges a violation of Section 11 of the Securities Act of 1933 ("Securities Act") based on alleged false and misleading statements concerning our lead recycling operations contained in, or incorporated by reference in, our Registration Statement on Form S-3 filed in connection with our November 2016 public offering. That claim is asserted on behalf of a class of persons who purchased shares pursuant to, or that are traceable to, that Registration Statement. The Amended Complaint seeks to hold the individual defendants liable as control persons pursuant to Section 15 of the Securities Act. The Amended Complaint seeks unspecified damages and plaintiffs' attorneys' fees and costs. On September 18, 2018, the defendants filed a motion to dismiss the Amended Complaint in its entirety and the plaintiff subsequently filed its opposition to the motion. In an Order dated August 14, 2019, the Court granted in part, and denied in part, the defendants' motion to dismiss. The Court granted the motion to dismiss the Securities Act Section 11 claim and the Exchange Act Section 10(b) and Rule 10b-5 claim based on alleged false and misleading statements and gave the plaintiffs leave to amend to address the deficiencies. The Court denied the motion to dismiss the Exchange Act Section 10(b) and Rule 10b-5 claims regarding site visits. On September 20, 2019, the plaintiffs filed a Second Amended Complaint that dropped the Securities Act Section 11 claim but otherwise alleges the same claims as were alleged previously. The Second Amended Complaint seeks unspecified damages and plaintiffs' attorneys' fees and costs. On November 1, 2019, the defendants filed a motion to dismiss the Exchange Act Section 10(b) and Rule 10b-5 claims in the Second Amended Complaint based on alleged false and misleading statements, but not the claims regarding site visits. The motion is under consideration by the Court. We deny that the claims in the Second Amended Complaint have any merit and we intend to vigorously defend the action.

Beginning on February 2, 2018, five purported shareholder derivative actions were filed in the United States District Court for the District of Delaware against us and certain of our current and former executive officers and directors, Stephen R. Clarke, Selwyn Mould, Thomas Murphy, Mark Weinswig, Vincent DiVito, Mark Slade and Mark Stevenson. On May 3, 2018, the cases were consolidated under the caption *In re Aqua Metals, Inc. Stockholder Derivative Litigation*, Case No. 1:18-cv-00201-LPS (D. Del.). The complaints were filed by persons claiming to be stockholders of Aqua Metals and generally allege that certain of our officers and directors breached their fiduciary duties to us by violating the federal securities laws and exposing us to possible financial liability. The complaints seek unspecified damages and plaintiffs' attorneys' fees and costs. The parties have entered into a stipulation staying the action until 30 days after a decision on our motion to dismiss the Amended Complaint in the class action described above. The individual defendants deny that the claims in the shareholder derivative action have any merit and intend to vigorously defend the action.

A former employee has filed a complaint with Nevada OSHA claiming that he was wrongfully terminated for his protected activities related to safety. The matter is in the investigation stage where OSHA is gathering facts related to the employee's claim. We are contesting the allegations by the employee. An evaluation of the likelihood of an unfavorable outcome cannot be made at this time.

We are not party to any other legal proceedings. We may, from time to time, be party to litigation and subject to claims incident to the ordinary course of business. As our growth continues, we may become party to an increasing number of litigation matters and claims. The outcome of litigation and claims cannot be predicted with certainty, and the resolution of any future matters could materially affect our future financial position, results of operations or cash flows.

16. Related Party Transactions

Related party transactions comprised the following for the years ended December 31, 2019 and December 31, 2018:

- A series of transactions with Interstate Battery and its affiliate, a greater than five percent owner of our common shares described at "Management's Discussion and Analysis of Financial Condition and Results of Operations – General - Interstate Battery Partnership" in this Form 10-K.

The Company has adopted a policy that any transactions with directors, officers, beneficial owners of five percent or more of our common shares, any immediate family members of the foregoing or entities of which any of the foregoing are also officers or directors or in which they have a financial interest, will only be on terms consistent with industry standards and approved by a majority of the disinterested directors of our board.

17. Income Taxes

Loss before income tax expense consists of the following (in thousands):

	Year ended December 31, 2019	Year ended December 31, 2018
US	$ (44,793)	$ (40,252)
Foreign	—	—
Total	$ (44,793)	$ (40,252)

The components of the provision for income tax expense consist of the following (in thousands):

	Year ended December 31, 2019	Year ended December 31, 2018
Current		
Federal	$ —	$ —
State	2	2
Deferred		
Federal	—	—
State	—	—
Total provision for income taxes	$ 2	$ 2

Reconciliation of the statutory federal income tax rates consist of the following :

	Year ended December 31, 2019	Year ended December 31, 2018
Tax at federal statutory rate	21.00 %	21.00 %
State tax, net of federal benefit	0.06 %	0.22 %
Change in rate	(0.07)%	(0.04)%
Valuation allowance	(19.11)%	(20.24)%
Impairment charge of acquired IP	(0.24)%	— %
Excess benefits from equity compensation	— %	— %
Other	(1.64)%	(0.93)%
Provision for taxes	— %	0.01 %

The components of deferred tax assets (liabilities) included on the consolidated balance sheet are as follows (in thousands):

	As of December 31, 2019	As of December 31, 2018
Deferred tax assets		
Capitalized start-up costs	$ 3,767	$ 4,103
Credits	364	465
Net operating losses	20,049	13,134
Others	2,744	1,153
Total gross deferred tax assets	26,924	18,855
Valuation allowance	(26,713)	(18,299)
Total gross deferred tax assets (net of valuation allowance)	$ 211	$ 556
Deferred tax liabilities		
Patents	$ (192)	$ (250)
Fixed assets	(19)	(108)
Beneficial conversion feature - debt discount	—	(198)
Total gross deferred tax liabilities	(211)	(556)
Net deferred tax assets	$ —	$ —

The Company's effective tax rate for the year ended December 31, 2019 was lower than the statutory tax rate primarily because of the valuation allowance on its US deferred tax assets taxed at lower rates, partially offset by state taxes and tax credits. The income tax expense for the years ended December 31, 2019 and December 31, 2018 relate to state minimum income tax.

Based on the available objective evidence at this time, management believes that it is more likely than not that the net deferred tax assets of the Company will not be fully realized. Accordingly, management has applied a full valuation allowance against net deferred tax assets at both December 31, 2019 and December 31, 2018. The net valuation allowance increased by approximately $8.41 million during the year ended December 31, 2019. The increase in net valuation allowance primarily relates to net operating losses generated during 2019.

The Company has Federal and California net operating loss carry-forwards of approximately $94.1 million and $4.1 million, respectively, available to reduce future taxable income which will begin to expire in December 31, 2034 for Federal and California purposes.

At December 31, 2019, the Company had research and development credits carryforward of approximately $0.1 million and $0.5 million for Federal and California income tax purposes, respectively. If not utilized, the Federal research and development credits carryforward will begin to expire in December 31, 2034. The California credits can be carried forward indefinitely.

Utilization of the Company's net operating loss may be subject to substantial annual limitation due to the ownership change limitations provided by the Internal Revenue Code and similar state provisions. Such an annual limitation could result in the expiration of net operating loss carryforwards prior to utilization.

The Company's policy is to account for interest and penalties as income tax expense. As of December 31, 2019, the Company had no interest related to unrecognized tax benefits. No amounts of penalties related to unrecognized tax benefits were recognized in the provision for income taxes.

The Company maintains liabilities for uncertain tax positions. These liabilities involve considerable judgement and estimation and are continuously monitored by management based on the best information available, including changes in tax regulations, the outcome of relevant court cases, and other information. The Company recognizes potential accrued interest and penalties related to unrecognized tax benefits as income tax expense. At December 31, 2019, the Company's total amount of unrecognized tax benefit was approximately $0.2 million, none of which will affect the effective tax rate, if recognized. The Company does not expect its unrecognized benefits to change materially over the next twelve months.

The Company files income tax returns with the United States federal government and the State of California. The Company's tax returns for all prior years from the Company's inception in 2014 remain open to audit for Federal and California purposes.

18. 401(k) Savings Plan

The Company maintains a defined-contribution savings plan under Section 401(k) of the Internal Revenue Code (the "401(k) Plan"). The 401(k) Plan covers all employees who meet defined minimum age and service requirements and allows participants to defer a portion of their annual compensation on a pretax basis. The Plan does not currently provide for matching contributions.

19. Supplemental Financial Information

Quarterly Results of Operations (Unaudited)

The following table presents the unaudited statements of operations data for each of the eight quarters in the period ended December 31, 2019. The information has been presented on the same basis as the audited financial statements and all necessary adjustments, consisting only of normal recurring adjustments, have been included in the amounts below to present fairly the unaudited quarterly results when read in conjunction with the audited financial statements and related notes. The operating results for any quarter should not be relied upon as necessarily indicative of results for any future period.

Unaudited Quarterly Results of Operations
(in thousands, except share and per share amounts)

	Three months ended				
	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019	Total for year 2019
Product sales	$ 437	$ 1,483	$ 2,361	$ 593	$ 4,874
Operating cost and expense					
Cost of product sales	4,681	7,185	8,231	4,702	24,799
Research and development cost	620	338	282	315	1,555
General and administrative expense	4,016	4,335	5,107	5,856	19,314
Total operating expenses	9,317	11,858	13,620	10,873	45,668
Loss from operations	(8,880)	(10,375)	(11,259)	(10,280)	(40,794)
Other income and expense					
Insurance proceeds net of related expenses	—	—	—	(792)	(792)
Interest expense	(2,889)	(203)	(142)	(243)	(3,477)
Interest and other income	63	77	85	45	270
Total other expense, net	(2,826)	(126)	(57)	(990)	(3,999)
Loss before income tax expense	(11,706)	(10,501)	(11,316)	(11,270)	(44,793)
Income tax expense	(2)	—	—	—	(2)
Net loss	$ (11,708)	$ (10,501)	$ (11,316)	$ (11,270)	$ (44,795)
Weighted average shares outstanding, basic and diluted	43,514,225	50,757,448	57,053,982	57,523,283	52,263,885
Basic and diluted net loss per share	$ (0.27)	$ (0.21)	$ (0.20)	$ (0.20)	$ (0.86)

	Three months ended				
	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018	Total for year 2018
Product sales	$ 1,726	$ 483	$ 1,169	$ 1,071	$ 4,449
Operating cost and expense					
Cost of product sales	5,436	4,600	6,453	6,272	22,761
Research and development cost	1,475	1,203	967	857	4,502
General and administrative expense	1,775	3,913	2,174	6,352	14,214
Total operating expenses	8,686	9,716	9,594	13,481	41,477
Loss from operations	(6,960)	(9,233)	(8,425)	(12,410)	(37,028)
Other income and expense					
Interest expense	(587)	(719)	(919)	(1,222)	(3,447)
Interest and other income	17	25	81	100	223
Total other expense, net	(570)	(694)	(838)	(1,122)	(3,224)
Loss before income tax expense	(7,530)	(9,927)	(9,263)	(13,532)	(40,252)
Income tax expense	(2)	—	—	—	(2)
Net loss	$ (7,532)	$ (9,927)	$ (9,263)	$ (13,532)	$ (40,254)
Weighted average shares outstanding, basic and diluted	27,768,008	30,134,995	38,779,710	38,905,282	34,154,826
Basic and diluted net loss per share	$ (0.27)	$ (0.33)	$ (0.24)	$ (0.35)	$ (1.18)

20. Subsequent Events

The Company has evaluated subsequent events through the date which the consolidated financial statements were available to be issued.

Equity Awards

In January 2019, the Company granted 1,548,253 RSUs to employees and directors primarily in connection with the Company's 2019 short-term incentive programs.

Insurance Proceeds

On January 30, 2020, the company announced that it had received a payment of $2.5 million related to the fire that occurred at the plant on November 29, 2019. This payment brought total insurance proceeds received to $5 million.

On March 11,2020, the company announced that it had received a payment of $5 million related to the fire that occurred at the plant on November 29, 2019. This payment brought total insurance proceeds received to $10 million.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

(a) *Evaluation of Disclosure Controls and Procedures*.

Our management, with the participation of our chief executive officer and chief financial officer evaluated the effectiveness of our disclosure controls and procedures pursuant to Rule 13a-15 under the Securities Exchange Act of 1934, as amended (the "Exchange Act"). Based upon that evaluation, our management, including our chief executive officer and chief financial officer, concluded that for the reasons described below our disclosure controls and procedures were effective as of December 31, 2019 in ensuring all material information required to be filed has been made known in a timely manner.

(b) *Changes in internal control over financial reporting.*

There were no changes to our internal control over financial reporting, as defined in Rules 13a-15(f) under the Exchange Act that occurred during the fiscal quarter ended December 31, 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

(c) *Management's report on internal controls over financial reporting.*

Our management is responsible for establishing and maintaining adequate internal controls over financial reporting, as defined under Rule 15a-15(f) under the Exchange Act. Our management has assessed the effectiveness of our internal controls over financial reporting as of December 31, 2019 based on the framework established in Internal Control - Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). Our internal control system was designed to provide reasonable assurance to our management and board of directors regarding the preparation and fair presentation of published financial statements. An internal control material weakness is a significant deficiency, or aggregation of deficiencies, that does not reduce to a relatively low level the risk that material misstatements in financial statements will be prevented or detected on a timely basis by employees in the normal course of their work. Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2019, and based on that evaluation, management concluded that our internal control over financial reporting was effective as of December 31, 2019.

This report does not include an attestation report of our registered public accounting firm regarding internal control over financial reporting. Management's report was not subject to attestation by our registered public accounting firm pursuant to the rules of the Securities and Exchange Commission that permit us to provide only management's report in this annual report.

Item 9B. Other Information

None.

PART III

The information required by Part III is omitted from this report because we will file a definitive proxy statement within 120 days after the end of our 2019 fiscal year pursuant to Regulation 14A for our 2020 Annual Meeting of Stockholders, or the 2020 Proxy Statement, and the information to be included in the 2020 Proxy Statement is incorporated herein by reference.

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this item will be contained in the 2020 Proxy Statement and is hereby incorporated by reference.

Item 11. Executive Compensation

The information required by this item will be contained in the 2020 Proxy Statement and is hereby incorporated by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information required by this item will be contained in the 2020 Proxy Statement and is hereby incorporated by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by this item will be contained in the 2020 Proxy Statement and is hereby incorporated by reference.

Item 14. Principal Accountant Fees and Services

The information required by this item will be contained in the 2020 Proxy Statement and is hereby incorporated by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) Financial statements

Reference is made to the Index and Financial Statements under Item 8 in Part II hereof where these documents are listed.

(b) Financial statement schedules

Financial statement schedules are either not required or the required information is included in the consolidated financial statements or notes thereto filed under Item 8 in Part II hereof.

(c) Exhibits

The exhibits to this Annual Report on Form 10-K are set forth below. The exhibit index indicates each management contract or compensatory plan or arrangement required to be filed as an exhibit.

Number	Exhibit Description	Method of Filing
1.1	Underwriting Agreement dated as of January 17, 2019 between the Registrant and National Securities Corporation as underwriter	Incorporated by reference from the Registrant's Current Report on Form 8-K filed January 17, 2019
1.2	Underwriting Agreement dated as of May 10, 2019 between the Company and Oppenheimer & Co. Inc., as representative of the several underwriters thereto	Incorporated by reference from the Registrant's Current Report on Form 8-K filed on May 10, 2019.
3.1	First Amended and Restated Certificate of Incorporation of the Registrant	Incorporated by reference from the Registrant's Registration Statement on Form S-1 filed on June 9, 2015.
3.2	Second Amended and Restated Bylaws of the Registrant	Incorporated by reference from the Registrant's Current Report on Form 8-K filed on September 27, 2018.
3.3	Certificate of Amendment to First Amended and Restated Certificate of Incorporation of the Registrant	Incorporated by reference from the Registrant's Registration Statement on Form S-1 filed on June 25, 2015.
3.4	Certificate of Amendment to the First Amended and Restated Certificate of Incorporation	Incorporated by reference from the Registrant's Quarterly Report on Form 10-Q filed on May 9, 2019.
4.1	Specimen Certificate representing shares of common stock of Registrant	Incorporated by reference from the Registrant's Registration Statement on Form S-1 filed on July 20, 2015.
4.2	Warrant dated September 8, 2014 issued to Liquid Patent Consulting, LLC	Incorporated by reference from the Registrant's Registration Statement on Form S-1 filed on June 9, 2015.
4.3	Warrant dated October 31, 2014 issued to National Securities Corporation	Incorporated by reference from the Registrant's Registration Statement on Form S-1 filed on June 9, 2015.
4.4	Form of Underwriters' Warrant	Incorporated by reference from the Registrant's Registration Statement on Form S-1 filed on July 20, 2015.
4.5	Convertible Term Note issued by Aqua Metals, Inc. to Interstate Emerging Investments, LLC dated May 24, 2016	Incorporated by reference from the Registrant's Quarterly Report on Form 10-Q filed on August 10, 2016

4.6	Warrant to Purchase Common Stock issued by Aqua Metals, Inc. to Interstate Emerging Investments, LLC dated May 24, 2016 (Two Year)	Incorporated by reference from the Registrant’s Quarterly Report on Form 10-Q filed on August 10, 2016
4.7	Warrant to Purchase Common Stock issued by Aqua Metals, Inc. to Interstate Emerging Investments, LLC dated May 24, 2016 (Three Year)	Incorporated by reference from the Registrant’s Quarterly Report on Form 10-Q filed on August 10, 2016
4.8	Warrant to Purchase Common Stock issued by Aqua Metals, Inc. to National Securities Corporation dated November 21, 2016 (Three Year)	Incorporated by reference from the Registrant’s Annual Report on Form 10-K filed on March 2, 2017
4.9	Warrant dated January 22, 2019 issued to National Securities Corporation	Incorporated by reference from the Registrant’s Current Report on Form 8-K filed January 17, 2019
10.1	Form of Indemnification Agreement entered into by the Registrant with its Officers and Directors	Incorporated by reference from the Registrant’s Registration Statement on Form S-1 filed on June 9, 2015.
10.2*	Aqua Metals, Inc. Amended and Restated 2014 Stock Incentive Plan	Incorporated by reference from the Registrant’s Proxy Statement on Form DEF 14A filed on April 24, 2017.
10.3	Lease Agreement dated August 7, 2015 between Registrant and with BSREP Marina Village Owner LLC	Incorporated by reference from the Registrant’s Current Report on Form 8-K filed on August 27, 2015.
10.4	Loan Agreement dated November 3, 2015 between Aqua Metals Reno, Inc. and Green Bank. N.A.	Incorporated by reference from the Registrant’s Quarterly Report on Form 10-Q filed November 10, 2015.
10.5	Deed of Trust, Security Agreement and Fixture Filing dated November 3, 2015 made by Aqua Metals Reno, Inc. in favor of Green Bank. N.A	Incorporated by reference from the Registrant’s Quarterly Report on Form 10-Q filed November 10, 2015.
10.6	Investor Rights Agreement between Aqua Metals, Inc. and Interstate Emerging Investments, LLC dated May 18, 2016	Filed as an exhibit to the Registrant’s Registration Statement on Form S-3 filed on August 1, 2016.
10.7+	Tolling/Lead Purchase Agreement dated February 7, 2017 between the Registrant and Johnson Controls Battery Group, Inc.	Incorporated by reference from the Registrant’s Quarterly Report on Form 10-Q filed on May 10, 2017.
10.8+	Equipment Supply Agreement dated February 7, 2017 between the Registrant and Johnson Controls Battery Group, Inc.	Incorporated by reference from the Registrant’s Quarterly Report on Form 10-Q filed on May 10, 2017.
10.9	Investor Rights Agreement dated February 7, 2017 between the Registrant and Tyco International Finance S.A.	Incorporated by reference from the Registrant’s Registration Statement on Form S-3 filed on February 27, 2017
10.10*	Aqua Metals, Inc. Officer and Director Share Purchase Plan	Incorporated by reference from the Registrant’s Quarterly Report on Form 10-Q filed on November 9, 2017.
10.11*	Executive Employment Agreement dated April 12, 2018 between Francis Knuettel II and Registrant	Incorporated by reference from the Registrant's Current Report on Form 8-K filed on April 19, 2018.
10.12	Amendment to the Equipment Supply Agreement dated April 16, 2018 between the Registrant and Johnson Controls Battery Group, Inc.	Incorporated by reference from the Registrant's Quarterly Report on Form 10-Q filed on May 9, 2018.
10.13*	Separation Agreement and Release dated April 19, 2018 between the Registrant and Stephen Clarke	Incorporated by reference from the Registrant's Current Report on Form 8-K filed on April 25, 2018.

10.14	Letter Agreement dated May 2, 2018 between David L. Kanen, Kanen Wealth Management LLC and the Registrant	Incorporated by reference from the Registrant's Current Report on Form 8-K filed on May 2, 2018.
10.15*	Employment Agreement dated May 2, 2018 between the Registrant and Stephen Cotton	Incorporated by reference from the Registrant's Current Report on Form 8-K filed on May 2, 2018.
10.16	Amendment No. 1 to Omnibus Amendment Agreement dated August 6, 2018 between the Registrant and Interstate Batteries Recycling, LLC	Incorporated by reference from the Registrant's Quarterly Report on Form 10-Q filed on August 8, 2018.
10.17*	Employment Agreement dated November 4, 2018 between the Registrant and Judd Merrill	Incorporated by reference from the Registrant's Annual Report on Form 10-K filed on February 28, 2019.
10.18*	Separation Agreement and Release dated December 3, 2018 between the Registrant and Selwyn Mould	Incorporated by reference from the Registrant's Annual Report on Form 10-K filed on February 28, 2019.
10.19*	Aqua Metals 2019 Stock Incentive Plan	Incorporated by reference from the Registrant's Definitive Proxy Statement filed on March 4, 2019
10.20+	Operations, Maintenance and Management Agreement dated February 26, 2019 between Veolia North America Regeneration Services, LLC and the Registrant	Incorporated by reference from the Registrant's Quarterly Report on Form 10-Q filed on May 9, 2019.
10.21+	Second Amendment dated June 27, 2019 to Equipment Supply Agreement dated April 16, 2018 between the the Registrant and Clarios	Incorporated by reference from the Registrant's Quarterly Report on Form 10-Q filed on July 31, 2019.
10.22	Letter Agreement dated September 24, 2019 between Aqua Metals, Inc. and Veolia North America Regeneration Services, LLC	Incorporated by reference from the Registrant's Current Report on Form 8-K filed on September 25, 2019.
21.1	List of subsidiaries of Registrant.	Incorporated by reference from the Registrant's Registration Statement on S-1 filed on June 9, 2015.
23.1	Consent of Armanino LLP, Independent Registered Public Accounting Firm.	Filed electronically herewith.
31.1	Certification under Section 302 of the Sarbanes-Oxley Act of 2002.	Filed electronically herewith.
31.2	Certification under Section 302 of the Sarbanes-Oxley Act of 2002.	Filed electronically herewith.
32.1	Certifications Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350.	Filed electronically herewith.
101.INS	XBRL Instance Document	Filed electronically herewith
101.SCH	XBRL Taxonomy Extension Schema Document	Filed electronically herewith
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document	Filed electronically herewith
101.LAB	XBRL Taxonomy Extension Label Linkbase Document	Filed electronically herewith
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document	Filed electronically herewith

101.DEF	XBRL Taxonomy Extension Definition Linkbase Document	Filed electronically herewith

* Indicates management compensatory plan, contract or arrangement.

+ Certain portions of the exhibit have been omitted pursuant to Registrant’s confidential treatment request filed with the Commission pursuant to Rule 24b-2 under the Securities Exchange Act of 1934. The omitted text has been filed separately with the Commission.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this annual report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

AQUA METALS, INC.

Date: March 11, 2020	By: /s/ *Stephen Cotton* Stephen Cotton, President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ *Stephen Cotton* Stephen Cotton	President, Chief Executive Officer and Director *(Principal Executive Officer)*	March 11, 2020
/s/ *Judd Merrill* Judd Merrill	Chief Financial Officer *(Principal Financial and Accounting Officer*	March 11, 2020
/s/ S. Shariq Yosufzai S. Shariq Yosufzai	Director, Chairman of the Board	March 11, 2020
/s/*Vincent L. DiVito* Vincent L. DiVito	Director	March 11, 2020
/s/ Sushil Kapoor Sushil Kapoor	Director	March 11, 2020
/s/ Gayle Gibson Gayle Gibson	Director	March 11, 2020
/s/Susanne Meline Susanne Meline	Director	March 11, 2020

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and
Stockholders of Aqua Metals, Inc. and Subsidiaries:

We consent to the incorporation by reference in the registration statements (No. 333-211810 and 333-220171) on Form S-8 and (Nos. 333-212808, 333-213501 and 333-216250) on Form S-3 of Aqua Metals, Inc. of our report dated March 11, 2020, with respect to the consolidated financial statements of Aqua Metals, Inc. and subsidiaries as of December 31, 2019 and December 31, 2018, and the related consolidated statements of operations, stockholders' equity, and cash flows for each of the two years in the period ended December 31, 2019.

/s/ Armanino LLP

San Ramon, CA
March 11, 2020

EXHIBIT 31.1

CERTIFICATIONS

I, Stephen Cotton, certify that:

(1) I have reviewed this annual report on Form 10-K of Aqua Metals, Inc.;

(2) Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

(3) Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

(4) The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:

(a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the period covered by this report based on such evaluation; and

(d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

(5) The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

(a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

AQUA METALS, INC.

Date: March 11, 2020

By: /s/ *Stephen Cotton*

Stephen Cotton, Chief Executive Officer

EXHIBIT 31.2

CERTIFICATIONS

I, Judd Merrill, certify that:

(1) I have reviewed this annual report on Form 10-K of Aqua Metals, Inc.;

(2) Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

(3) Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

(4) The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:

(a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the period covered by this report based on such evaluation; and

(d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

(5) The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

(a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

AQUA METALS, INC.

Date: March 11, 2020

By: */s/ Judd Merrill*
Judd Merrill, Chief Financial Officer
(Principal Financial Officer)

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. ss.1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Aqua Metals, Inc. (the "Company") on Form 10-K for the period ended December 31, 2018 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Stephen Cotton, the Chief Executive Officer, and Judd Merrill, the Chief Financial Officer, of the Company, respectively, certify, pursuant to 18 U.S.C. §1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

By:	/s/ *Stephen Cotton*	Dated: March 11, 2020
	Stephen Cotton	
Title:	Chief Executive Officer	
	(Principal Executive Officer)	

By:	/s/ Judd Merrill	Dated: March 11, 2020
	Judd Merrill	
Title:	Chief Financial Officer	
	(Principal Financial and Accounting Officer)	

This certification is made solely for the purposes of 18 U.S.C. Section 1350, subject to the knowledge standard contained therein, and not for any other purpose.