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SPIRE Corp  
Form 10-K  
March 31, 2014

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, 2013 or

Transition Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934  
For the transition period from \_\_\_\_\_ to \_\_\_\_\_

Commission file number: 0-12742

Spire Corporation  
(Exact name of registrant as specified in its charter)

Massachusetts  
(State or other jurisdiction of incorporation or organization) 04-2457335  
(I.R.S. Employer Identification Number)

One Patriots Park  
Bedford, Massachusetts 01730-2396  
(Address of principal executive offices)

(781) 275-6000  
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:  
Title of Each Class Name of Each Exchange on Which Registered  
None N/A

Securities registered pursuant to Section 12(g) of the Act:  
Common Stock, \$0.01 par value per share  
(Title of class)

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 Section 15(d) of the 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 preceding 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

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Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files).  
Yes  No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer  Accelerated filer  Non-accelerated filer  Smaller reporting company   
(Do not check if a smaller reporting company)

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

Aggregate market value of the voting common stock held by non-affiliates of the registrant as of June 30, 2013 was approximately \$3.4 million.

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The number of shares of the registrant's common stock outstanding as of March 25, 2014 was 9,207,874.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the Special Meeting in Lieu of 2014 Annual Meeting of Stockholders currently scheduled to be held on May 20, 2014, are incorporated by reference in Part III of this Form 10-K.

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Spire Corporation  
 Form 10-K  
 For the Year Ended December 31, 2013

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## FORWARD-LOOKING STATEMENTS

This Report contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), which statements involve risks and uncertainties. These statements relate to our future plans, objectives, expectations and intentions. These statements may be identified by the use of words such as "may", "could", "would", "should", "will", "expects", "anticipates", "intends", "plans", "believes", "estimates" and similar expressions, and includes statements regarding the expected growth of the solar market, the potential impact of pending litigation on our results, and the sufficiency of cash resources in 2014. Our actual results and timing of certain events could differ materially from those discussed in these statements. Factors that could contribute to these differences include but are not limited to, those discussed under "Item 1A. Risk Factors", "Management's Discussion and Analysis of Financial Condition and Results of Operations" and elsewhere in this Report. Readers are encouraged to carefully review these risk factors. The cautionary statements made in this Report should be read as being applicable to all forward-looking statements wherever they appear in this report. We undertake no obligation to update any forward looking statements.

## PART I

### Item 1. Business

Spire Corporation ("Spire" or the "Company") is a Massachusetts corporation incorporated in 1969. Our principal offices are located at One Patriots Park, Bedford, Massachusetts, and our phone number is (781) 275-6000. Our SEC filings are available through our website, [www.spirecorp.com](http://www.spirecorp.com). Our common stock currently trades on the OTC Markets under the symbol "SPIR".

#### Principal Products and Services

##### Overview

Spire has been in the solar business for over 30 years, initially pioneering developments in solar cell technology. Currently, we develop, manufacture and market capital equipment and services for the solar photovoltaic industry, including turn-key solutions and individual pieces of manufacturing equipment and full turn-key lines for cell and module production and testing. We have been continually active in research and development, with over \$100 million of R&D conducted and 12 issued patents and 12 patents pending. This technical expertise has provided the platform for development of our manufacturing equipment and turn-key lines. We have equipment deployed in approximately 50 countries and have among our customers some of the world's leading solar manufacturers. Our Spi-Sun simulator is used by many of the world's leading testing agencies and laboratories including the National Renewable Energy Laboratory ("NREL"), Sandia National Laboratories, Underwriters Laboratories Inc., TUV and the European Solar Test Installation.

We believe that we are one of the world's leading suppliers of the capital equipment and technology needed to produce solar photovoltaic modules. Our individual manufacturing equipment products and our SPI-Line™ integrated turn-key cell and module production lines can be scaled, customized, and automated with high throughput. These machines are designed to meet the needs of a broad customer base ranging from manufacturers relying on mostly manual processes, to some of the largest photovoltaic manufacturing companies in the world incorporating advanced automation processes.

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Our total sales and revenues for 2013 decreased approximately 34% compared to 2012 and was primarily attributable to a decrease of \$7.6 million in solar module manufacturing equipment revenues. However, with over forty years since our incorporation and over thirty years in the solar market, our globally strong name recognition and reputation positions us to capitalize on the market's expected rebound as manufacturers begin capital improvement programs including equipment updates and expansion.

In the biomedical area, through our variable interest entity, N2 Biomedical LLC ("N2 Bio"), the Company provides value-added surface treatments to manufacturers of orthopedic and other medical devices that enhance the durability, antimicrobial characteristics or other material characteristics of their products; and performs sponsored research programs into practical applications of advanced biomedical technologies. See Note 19 to the consolidated financial statements.

The foundation for all of our business units is our industry-leading expertise in manufacturing and materials technologies. This proprietary knowledge enables us to further develop our products and services in each market we serve.

Sale of Biomedical Business Unit; Variable Interest Entity

On September 18, 2013, we and Spire Biomedical, Inc. (the "Subsidiary" and together with us, "Spire Bio") entered into an Asset Purchase Agreement (the "Purchase Agreement") with N2 Bio pursuant to which N2 Bio agreed to (i) acquire substantially all of the assets of the Subsidiary's biomedical business (the "Bio Business Unit") and (ii) assume and pay certain liabilities related to the purchased assets as set forth in the Purchase Agreement (collectively, the "Transaction"). The Transaction closed on September 18, 2013. The purchase price for the Bio Business Unit was \$10.5 million plus the assumption of liabilities of approximately \$100 thousand, with \$6.0 million paid in cash at closing, a \$2.4 million subordinated convertible promissory note, and 310,549 Series A Convertible Preferred Units of N2 Bio valued at approximately \$2.1 million (\$6.72 per share). The assets and liabilities of the Subsidiary's biomedical business are under common control and were recorded at carryover basis for financial reporting. The difference between the consideration paid and the carrying value of the assets and liabilities acquired by N2 Bio was recorded as a deemed dividend by us in the amount of \$9.5 million and has been eliminated in consolidation. Mark C. Little was the Chief Executive Officer of the Subsidiary, is a member of our Board of Directors and is the Chief Executive Officer of N2 Bio. Mark C. Little is the son of Roger G. Little, our Chairman of the Board. Roger G. Little is also a member of the Board of Directors of N2 Bio.

We have determined that N2 Bio is a variable interest entity ("VIE") because the equity investment at risk from the majority shareholders of N2 Bio is not sufficient to permit N2 Bio to finance its activities without additional subordinated financial support. As discussed above, N2 Bio is subject to a subordinated convertible promissory note due to us. Additionally, Mark Little is the Chief Executive Officer of N2 Bio and also a member of our Board of Directors. We have also determined that we have the obligation to absorb losses and the right to receive benefits from N2 Bio that could potentially be significant to it. Therefore, we have determined that N2 Bio is a VIE and that we are a primary beneficiary of the VIE and must consolidate the financial condition, results of operations and cash flows of N2 Bio with those of our own. See Note 19 to the consolidated financial statements.

#### Sale of Semiconductor Business Unit; Discontinued Operations

On March 9, 2012, we completed the sale of our semiconductor business unit, which provided semiconductor foundry services, operated a semiconductor foundry and fabrication facility and was engaged in the business of wafer epitaxy, foundry services, and device fabrication for the defense, medical, telecommunications and consumer products markets (the "Semiconductor Business Unit"), to Masimo Corporation ("Masimo"). Accordingly, the results of operations and assets and liabilities of the Semiconductor Business Unit are being presented herein as discontinued operations. See Note 18 to the consolidated financial statements.

#### Solar Industry Overview

Over the past decade, solar power derived from photovoltaics ("PV") has been one of the fastest growing industries in the world. From 2002 through 2013 new worldwide photovoltaic installations grew more than 50 times, from under 0.5 gigawatts ("GW") in 2002 to approximately 38 GW in 2013. Although more recently the growth rate has slowed, the market for PV systems installations is still estimated to more than double to over 100 GW by 2020. Key factors driving the demand for solar power include rising fossil fuel prices and environmental concerns including climate change driven by green-house gases. As a result, businesses, governments, and consumers have become increasingly supportive of solar energy development and implementation. However, despite the robust continued growth in PV systems installations, an oversupply of PV modules relative to market demand has led to precipitously declining prices and an actual decrease in overall market value. The recent oversupply has also resulted in reduced demand for PV manufacturing equipment that will not improve until the module supply/demand imbalance is rectified by growth in the PV systems market predicted to occur in the 2014/2015 time frame.

## Photovoltaic Module Manufacturing Overview

Photovoltaics is the direct conversion of sunlight into electricity through the use of semiconductor cells. Though various thin film and other semiconductor materials can be used, the majority of the photovoltaic systems market, approximately 90%, utilize crystalline silicon modules. Silicon modules are high efficiency and low cost with the demonstrated endurance required by systems providers.

Crystalline solar cells and modules are produced in four basic steps: (1) polysilicon production; (2) ingot growth and wafering; (3) cell production; and (4) module assembly. The value chain begins with the processing of quartz sand to produce polysilicon. The resulting polysilicon is melted down and cast into ingots which are then sliced into wafers. The wafers are manufactured into solar cells through an etching, doping and coating process. The solar cells are combined into modules by testing and sorting the cells, interconnecting the cells into strings, transferring the strings onto a glass superstrate, laminating the structure with a back sheet, framing the module and, finally, testing the module performance. We predominately provide equipment for the final two steps in the manufacturing process: cell production and module assembly but have also provided turnkey support and quotes for the growth and wafering process.



## Products and Services

Our core business is in the solar market, where we provide individual pieces of manufacturing equipment, turn-key cell and module lines, cell supply and solar factory management services. Our solar business was responsible for 53% of our revenues in 2013. The biomedical device business, including the results of N2 Bio, our variable interest entity, subsequent to September 18, 2013, accounted for 47% of our revenues in 2013.

### Spire Solar

We believe that we are one of the world's leading suppliers of manufacturing equipment and technology needed to manufacture solar photovoltaic power systems. Our individual items of manufacturing equipment and our Spi-Line™ module production lines span the full photovoltaic module fabrication process, which currently includes:

- Sorting solar cells into performance groups;
- Assembling and soldering strings of cells interconnected with metal ribbons or "tabs";
- Completing the module circuit by soldering bus ribbons to connect the strings together;
- Cutting polymer, fiberglass and back cover to length and assembling them with the glass and module circuit in preparation for encapsulation;
- Laminating the module assembly and curing the encapsulating polymer;
- Final assembly, including edge trimming, installing an edge gasket and frame, and attaching a junction box;
- Performing a high voltage isolation test to guarantee safe voltage isolation between the cell circuit and the module frame; and
- Electrically testing the module performance by measuring a current-voltage curve under simulated sunlight.

The fabrication of photovoltaic modules uses solar cells and module materials as input and produces functional photovoltaic modules, ready for use. We provide the necessary equipment and training for implementing these process steps for individual equipment items and for fully integrated production lines.

Many of our customers have been new entrants in the solar photovoltaic market. These entities are primarily local manufacturers that are encouraged to produce photovoltaic modules with the aid of government incentive programs. We offer a turn-key solution with enabling technology to allow these companies to quickly enter into the market, or to expand existing capacity. We also sell individual equipment primarily to existing silicon module manufacturers as well as certain pieces of our module equipment to "thin film" manufacturers, specifically lamination and testing equipment. We provide full turn-key solar cell and wafer lines to customers for vertical integration. A majority of the equipment used in these lines is purchased from third parties and we provide integration services along with proprietary cell line process technology.

### Biomedical

Through our variable interest entity, N2 Bio, we provide value-added surface treatments to manufacturers of orthopedic and other medical devices that enhance the durability, antimicrobial characteristics or other material characteristics of their products, and perform sponsored research programs into practical applications of advanced biomedical technologies.

### Principal Distribution Methods

Our products and services are sold primarily by our direct, internal sales staff with two notable exceptions: (i) in certain offshore markets, we utilize independent sales representatives and distributors to augment our sales efforts for our solar equipment, and (ii) proposals for sponsored research and development work are prepared by our on-staff scientists and researchers.

### Competitive Conditions

The markets in which we operate are highly competitive and characterized by changes due to technological improvements and developments. We compete with numerous other manufacturers and service providers in each of our product and service areas, many of which have greater resources and sales. Additionally, with respect to our competition, our products and services utilize alternative technologies. Price, service and product performance are significant elements of competition in the sale of each of our products. We believe that there are considerable barriers to entry into the markets we serve, including a significant investment in

specialized capital equipment and product design and development, and the need for a staff with sophisticated scientific and technological knowledge.

#### Sources and Availability of Raw Materials

Principal raw materials purchased by us include polymer extrusions, molded plastic parts, silicon photovoltaic cells, high purity industrial gases, custom metal welded structures, electrical components and electronic controls. In certain instances these items are available from multiple suppliers and we generally rely on more than one supplier for each item. At times, certain raw materials and sub-components within our equipment build are procured from a single-source or from a limited number of third party suppliers. At this time there are no constraints on the raw materials used in our operations.

#### Key Licenses and Patents, Government Rights to Intellectual Property

Through over 30 years of research and development, we have accumulated extensive scientific and technological expertise. We protect our technological advances as trade secrets, in part through confidentiality agreements with employees, consultants and third parties. We also seek and enforce patents as appropriate. We currently have 12 issued United States patents, 9 patents pending in the United States and 3 foreign patents pending, all of which cover elements of our materials and processing technologies.

The United States government retains the right to obtain a patent on any invention developed under government contracts as to which we do not seek and obtain a patent, and may require us to grant a third party license of such invention if steps to achieving practical application of the invention have not been taken. The United States government also retains a non-exclusive, royalty-free, non-transferable license to all technology developed under government contracts, whether or not patented, for government use, including use by other parties to United States government contracts. Furthermore, our United States government contracts prohibit us from granting exclusive rights to use or sell any inventions unless the grantee agrees that any product using the invention will be manufactured substantially in the United States.

#### Government Regulation of Contracts

Our United States government contracts are subject to a large number of federal regulations and oversight requirements. Compliance with the array of government regulations requires extensive record keeping and the maintenance of complex policies and procedures relating to all aspects of our business, as well as to work performed for us by any subcontractors. We believe that we have put in place systems and personnel to ensure compliance with all such federal regulations and oversight requirements. All contracts with United States government agencies have been audited by the government through December 2008. We have not incurred substantial losses as a result of these incurred cost audits.

#### Research and Development

Our policy is to support as much of our research and development as possible through government contract funding, which we recognize as revenue. Revenues from our research and development contracts and grants funded by the United States government, and their percent of consolidated net sales and revenues were \$439 thousand, or 3%, and \$1.7 million, or 8%, for the years ended December 31, 2013 and 2012, respectively.

Our contracts with the United States government grant to us proprietary rights in any technology developed pursuant to such contracts and grant to the United States government a non-exclusive license to utilize the technology for its benefit. The United States government retains the right to pursue patent protection on any inventions made under these contracts as to which patent protection is not sought and obtained by us. To date, the government has not exercised its rights to patent nor indicated it has or it will do so. We still have the ability to sell our rights to develop technology and have successfully sold certain technical rights and know-how in the past. Our rights to technology developed under contracts with private companies vary, depending upon negotiated terms.

Our internally funded research and development expenditures were \$31 thousand and \$233 thousand for the years ended December 31, 2013 and 2012, respectively.

#### Customers and Markets

Revenues from the delivery of biomedical services to Stryker Orthopedics and Biomet, Inc. accounted for 20% and 12% , respectively, of total net sales and revenues for 2013.

Revenues from the delivery of biomedical services to Stryker Orthopedics and revenues from the delivery of solar equipment to First Solar, Inc. accounted for 14% and 12% , respectively, of total net sales and revenues for 2012.

Our export sales, which accounted for 34% and 53% of net sales and revenues for 2013 and 2012, respectively, continue to constitute a significant portion of our net sales and revenues. Export sales of 77% and 88% in 2013 and 2012, respectively, were to solar customers with the remainder to biomedical related customers.

The following table shows net sales and revenues by geographic area (based on customer location) for the years ended December 31:

(in thousands)	2013	%	2012	%	
United States	\$9,651	66	% \$10,436	47	%
Asia	2,491	17.0	% 7,971	36.0	%
Europe/N. Africa	2,194	15.0	% 3,628	17.0	%
Rest of the world	245	2	% 75	—	%
	\$14,581	100	% \$22,110	100	%

#### Environmental Quality

Compliance with federal, state and local provisions regulating the discharge of materials into the environment has not materially affected our capital expenditures, earnings or its competitive position. Currently there are no lawsuits related to the environment or material administrative proceedings pending against us.

#### Employees

At December 31, 2013, we had approximately 86 employees, of whom 82 worked full time. Our year-end head count included 45 employees in manufacturing operations, 2 employees in research and development, and 39 employees in sales, general and administrative. We also employ part-time employees and hire independent contractors. Our employees are not represented by any collective bargaining agreement, and we have never experienced a work stoppage. We believe that our employee relations are good.

#### Item 1A. Risk Factors

In addition to the other information in this Form 10-K, the following risk factors inherent in and affecting our business should be considered. The descriptions in this Form 10-K contain forward-looking statements that involve risks and uncertainties. Our actual results and the timing of certain events may differ materially from the results and timing described in the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those described below and in “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and above in “Business.”

#### Risks Relating to Our Business

Our success will depend upon our ability to effectively implement our business model of creating or acquiring scientifically advanced technology, developing and manufacturing commercially viable products from such technology and successfully marketing and distributing such products. The failure to successfully execute any stage of this process could have a materially negative impact on our business and results of operations.

We believe that our continued success will depend upon our ability to create or acquire scientifically advanced technology, apply our technology cost-effectively across product lines and markets, develop or acquire proprietary products, attract and retain skilled development personnel, obtain patent or other protection for our products, obtain required regulatory approvals, manufacture and successfully market our products either directly or through outside distributors and sales representatives and supply sufficient inventory to meet customer demand. There can be no assurance that we will realize financial benefit from our technology development and application efforts, that we will continue to be successful in identifying, developing and marketing new products or enhancing our existing products, or that products or technologies developed by others will not render our products or technologies non-competitive or obsolete.

We have experienced losses from continuing operations and we expect that our operating results will fluctuate in the future.

We have experienced losses from continuing operations in fiscal year 2013 and 2012. These losses have contributed to an accumulated deficit of approximately \$24.4 million as of December 31, 2013. The report of our independent registered public accounting firm that accompanies our audited consolidated financial statements for the years ended December 31, 2013 and 2012 contains an explanatory note regarding our ability to continue as a going concern. Our revenues have not been sufficient to cover our operating expenses, and we anticipate that we may sustain future losses from operations if revenues do not increase. Future fluctuations in operating results may also be caused by a number of factors, many of which are outside our control. Additional factors that could affect our future operating results include the following:

- Availability of raw materials processed by the capital equipment we provide to our buyers, particularly the polysilicon used in the manufacture of the silicon wafers and solar cells;
- Delays, postponements or cancellations of orders and shipments of our products, particularly in our solar equipment business where individual order sizes may be large and thus may represent a significant portion of annual revenue;
- Loss of major customers, particularly as a result of customers changing their own product designs in such ways as reduce or eliminate the need for the manufacturing services we provide;
- Reductions in the selling prices of our products and services as a result of competitive pressures;
- Certain customers purchasing our solar equipment and need to raise capital or borrow money as they are not currently profitable. If capital and credit markets are again disrupted this may impact our ability to grow revenues;
- Increased competition from current and future competitors, including competition resulting from services and products utilizing competing technologies;
- Termination of existing grants with government agencies or delays in funding of grants awarded;
- Problems experienced by our solar representatives through which we market, sell, and service certain foreign markets; and
- We have had customers cancel contracts and forfeit their deposits. This may occur in the future and these deposits may not offset costs incurred until the inventory can be redeployed to other customers.

If we are unable to reach and sustain profitability from our operations, we risk depleting our working capital balances and our business may not continue as a going concern. Even if we are profitable, we may require additional working capital to fund expected growth. Although future sales of assets or technology licenses may be pursued, such sales cannot be assured. In addition, we may need to raise additional capital, or arrange other sources of funds, in order to sustain our operations. There can be no assurance that we will be able to raise such funds if they are required. Even if new financing were available, it may not be on commercially reasonable terms or terms that are acceptable to us.

The photovoltaic ("PV") industry may not be able to compete successfully with fossil fuel-based power generation or other sources of renewable energy.

The solar energy market is at a relatively early stage of development, in comparison to fossil fuel-based power generation and comprises a relatively small component of the total power generation market and competes with other sources of renewable energy, as well as fossil fuel-based power generation. If PV technology proves unsuitable for widespread adoption at economically attractive rates of return or if additional demand for solar manufacturing equipment fails to develop sufficiently or takes longer to develop than we anticipate, we may be unable to grow our business or generate sufficient net sales to sustain profitability. In addition, demand for solar manufacturing equipment in our targeted markets may develop to a lesser extent than we anticipate. Many factors may affect the viability of widespread adoption of PV technology and demand for solar manufacturing equipment, including but not

limited to the following:

- cost-effectiveness of solar energy compared to fossil fuel-based power generation and other renewable energy sources;
- performance, reliability and availability of solar energy generated by PV systems compared to fossil fuel-based power generation and other non-solar renewable energy sources and products;
- success of other renewable energy generation technologies, such as hydroelectric, tidal, wind, geothermal, solar thermal, concentrated PV, and biomass;
- fluctuations in economic and market conditions that affect the viability of fossil fuel-based power generation and other renewable energy sources, such as increases or decreases in the price of natural gas, oil, coal and other fossil fuels;
- fluctuations in capital expenditures by solar module manufactures which tend to decrease when the economy slows and when interest rates increase; and
- availability and size of government subsidies and incentives to support the development of the solar energy industry.

Reduced growth in or the reduction, elimination, or expiration of government subsidies, economic incentives, renewable energy targets and other support for on-grid solar electricity applications, could reduce demand and/or price levels for our solar



manufacturing equipment, and limit our growth or lead to a reduction in our net sales, and adversely impact our operating results.

Demand for solar manufacturing equipment, including on-grid applications, has historically been dependent in part on the availability and size of government subsidies and economic incentives. Currently, the cost of solar electricity exceeds the retail price of electricity in most major markets in the world. As a result, federal, state and local governmental bodies in many countries, most notably Germany, Italy, Spain, South Korea, Japan, China and the United States, have provided subsidies in the form of feed-in tariffs, rebates, tax write-offs and other incentives to end-users, distributors, systems integrators and/or manufacturers of PV products to promote the use of solar energy in on-grid applications and to reduce dependency on other forms of energy. Many of these government incentives have expired or are due to expire in time, phase out over time, cease upon exhaustion of the allocated funding and/or are subject to cancellation or non-renewal by the applicable authority. The reduction, expiration or elimination of relevant government subsidies or other economic incentives may result in the diminished competitiveness of solar energy relative to fossil fuel-based power generation and other renewable sources of energy, and adversely affect demand for solar manufacturing equipment or result in increased price competition, all of which could cause our sales and revenue to decline and have a material adverse effect on our financial condition, results of operations, business and/or prospects. Further, any government subsidies and economic incentives could be reduced or eliminated altogether at any time and for any reason. We believe that government subsidies and incentives could be eliminated in the near future. Also, relevant statutes or regulations may be found to be anti-competitive, unconstitutional or may be amended or discontinued for other reasons. Some government subsidies and incentives have been subject to challenge in courts in certain foreign jurisdictions. New proceedings challenging minimum price regulations or other government incentives in countries in which we conduct our business or in which our customers conduct business, may be initiated, and if successful, could cause a decrease in demand for our solar manufacturing products.

Should photovoltaic technology be deemed unsuitable for global adoption, coupled with a potential lack of sufficient demand for solar modules or photovoltaic manufacturing equipment, we may experience an adverse effect on our revenues and related profits.

Our ability to expand revenues and reach and sustain profitability is dependant, in large part, on the feasibility of widespread adoption of photovoltaic technology and world demand for solar modules and photovoltaic manufacturing equipment. Factors associated with the feasibility of widespread adoption of photovoltaic technology and world demand for solar modules and photovoltaic manufacturing equipment, the lack of which would limit the potential customers or expansion of our existing customer base, include, but are not limited to, the following:

- Consolidation of equipment manufacturers in the marketplace thereby reducing competitive advantages while experiencing market pricing concessions;
  - Global nature of the competitive landscape and challenges associated with geographic diversity;
  - Position in the marketplace relative to competition and ability to scale upward as business opportunities are identified;
  - and
- Unforeseen fluctuations in financially viable markets that affect the ability of customers to secure required financing for capital expenditures at competitive rates as well as vendor credit constraints and interruptions in materials flow throughout the supply chain.

An increased global supply of photovoltaic modules has caused and may continue to cause structural imbalances in which global photovoltaic module supply exceeds demand, which could have a material adverse effect on our business, financial condition and results of operations

Solar manufacturers had installed production capacity that significantly exceeded global photovoltaic module demand during the past several years. We believe the solar industry will continue to experience periods of structural imbalance between supply and demand (i.e., where production capacity exceeds global demand) and could effect demand for photovoltaic manufacturing equipment. During the past several years, industry average sales prices per watt have declined significantly, as competitors reduced average sales prices to sell-through inventories worldwide. If our competitors reduce photovoltaic manufacturing equipment pricing to levels near or below their manufacturing costs, or are able to operate at minimal or negative operating margins for sustained periods of time, or if demand for photovoltaic manufacturing equipment does not grow sufficiently, our business, financial condition and results of operations could be adversely affected.

Changes in the availability and price of used solar equipment and spare parts on the secondary / used equipment market could result in lower sales of new solar equipment manufactured by us along with increasing cost due to the inability to obtain economies of scale for purchasing raw materials which could, in turn, result in lower profits on sales of our products.

The global economic slowdown within the solar industry has resulted in the closure of several photovoltaic manufactures along with current manufactures to scale down operations via liquidating manufacturing equipment. The liquidation of these photovoltaic manufactures has resulted in a secondary market of used manufacturing equipment being sold which is directly competing with our new solar equipment. Additionally, as we manufacture fewer units of equipment due to the excess used equipment market, we may experience higher raw material cost to build new equipment due to lower volume of production which negatively impacts our ability to obtain economies of scale when purchasing raw material components. Changes in the price of these raw material components are more likely to occur during times of economic volatility, can significantly increase the costs of production which could have a material negative effect on the profitability of our business, particularly if we, due to pricing considerations to compete with used equipment supplies, are unable to recover the increased costs from our customers.

Our biomedical processing services, through our variable interest entity, N2 Biomedical LLC, are sold to OEM medical device manufacturers, primarily makers of orthopedic implants. Our ability to expand revenue and reach and sustain profitability depends substantially on the stability and growth of product lines that have incorporated our services into their product offering.

Demand for our customer products may be impacted by recent reforms to the healthcare system in the United States which may adversely affect the demand for our services or impose direct or indirect additional costs. We may be limited in our ability to raise prices and pass additional costs to our customers. Our customers or their competitors may introduce new products that compete with existing product lines. If customers fail to adopt our services in these newer generation of products this may impair our ability to expand and maintain our revenue and reach and sustain profitability. Our ability to introduce new services is dependent upon medical device manufacturers adopting our technology and the devices being approved by appropriate governmental regulatory authorities, factors over which we have limited control.

Disruptions in the capital and credit markets, such as those that occurred in connection with the national and world-wide financial crisis of the late 2000s, could adversely affect our results of operations, cash flows and financial condition, or those of our customers or suppliers.

Disruptions in the capital and credit markets could adversely impact our results of operations, cash flows and financial condition, or those of our customers and suppliers. Such disruptions could adversely affect our ability to draw on our bank credit facilities. Disruptions in the capital and credit markets as a result of uncertainty, changing or increased regulation, reduced alternatives or failures of significant financial institutions could adversely affect our access to liquidity needed to conduct or expand our businesses or conduct acquisitions or make other discretionary investments, as well as our ability to effectively hedge our currency or interest rates. These same conditions and disruptions may also adversely impact the capital needs of our customers and suppliers, which, in turn, could adversely affect our results of operations, cash flows and financial condition. These may include project delays as well as longer project cycles from start to finish.

Our business relies in part on a limited number of products, and unfavorable sales and product mix may adversely affect our revenues, operating results and cash flows.

A significant portion of our net sales and revenues have historically been derived from sales of solar equipment module lines augmented by individual sales of simulators, assemblers, laminators and other module equipment which accounted for 33% and 56% of our net sales and revenues for 2013 and 2012, respectively. There can be no assurance that solar equipment module lines and individual equipment component sales will in fact increase or maintain their current level of sales. Circumstances that might have an effect on the sales pipeline and resulting levels of future sales

of these products include factors beyond our control. Specifically, demand for solar products and the introduction of competing product offerings by other equipment manufacturers could have a material adverse affect on our business, financial condition, operating results, cash flow and future prospects.

Our business relies in part on a limited number of customers, and unfavorable developments in relation to any major customer may adversely affect our revenues, operating results and cash flows.

Sales and revenues from the delivery of biomedical services to two different customers accounted for 20% and 12% of total net sales and revenues for 2013. Follow on orders from these customers would be subject to a competitive bid process.

Sales and revenues from the delivery of solar equipment and biomedical services to two different customers accounted for 12% and 14%, respectively, of total net sales and revenues for 2012. Follow on orders from these customers would be subject to a competitive bid process.

Revenue recognition of solar turn-key module and cell lines may result in significant fluctuations in operating results in sequential reporting periods and year over year comparisons. While many of these sales of solar equipment are non-recurring,

we have had instances of recurring sales to such customers and may have them in the future. If an unfavorable development were to occur with respect to any significant customer it would likely have a material adverse affect on our business, financial condition, operating results, cash flows and future prospects.

In order to mitigate potential exposure to risk associated with the collection of receivables, we often request that customers agree to pay an advance down payment upon execution of a purchase and sale agreement. The collection of these advances are critical to improving the cash flow. If however, customers do not accept contract terms that include the payment of advances, there may be a negative effect on our financial condition.

Certain critical raw materials and sub-components purchased within our equipment build are frequently procured from a single-source or from a limited number of third party suppliers within the supply chain. A vendor's inability to deliver on a timely basis could result in manufacturing delays and our capability to meet scheduled ship dates to our customers based upon contractual obligations without incurring additional production costs.

Our inability to procure the raw materials and sub-components based upon acceptable specifications and tolerances within required lead times could disrupt or impair our ability to manufacture our solar equipment or add increased costs to the manufacturing process. Certain critical raw materials and sub-components purchased within our equipment build are frequently procured from a single-source or from a limited number of third party suppliers. Accordingly, the inability of any of our key suppliers to deliver on a timely basis could disrupt our supply chain and adversely affect our operations. Furthermore, in certain instances several of our suppliers tend to be smaller companies that may not be able to maintain a required flow of materials should our volume requirements rapidly increase. Such conditions could find us unable to identify new suppliers able to meet our raw material specifications to be incorporated into our production process on commercially reasonable terms and in a timely manner.

We sell our products and services against established competitors, and entities now operating in related markets may enter our markets. Some of our current and potential competitors have greater financial and technical resources than we do. Should we be unable to offer our customers products and services that represent attractive price versus value, our business would suffer.

Although we believe that there are considerable barriers to entry into the markets we serve, including a significant investment in specialized capital equipment, product design and development, and the need for a staff with sophisticated scientific and technological knowledge, there can be no assurance that new or existing entities would not seek to enter our markets or that we would be able to compete effectively against such entities.

The photovoltaic market is maturing due to the rapid growth of the industry. Our future success depends on our ability to sustain our business model.

We currently develop, manufacture and market customized turn-key solutions for the solar industry, including individual pieces of manufacturing equipment and full turn-key lines for cell and module production and testing. As the photovoltaic market matures, there may be fewer opportunities for start up firms. Further, customer purchasing decisions such as when purchasing decisions are made or how managed, what types of services are combined with purchased equipment may evolve as the industry expands. For example, we may determine that it is in our best interest to alter our strategy to focus on individual pieces of manufacturing equipment (as opposed to turn key solutions). We may have to offer vendor financing programs. Potentially re-engineering our focus toward individual pieces of manufacturing equipment and away from turn-key solutions may result in identification of non-productive assets, associated write-downs and/or reserves along with excess capacity and infrastructure costs.

If we are unable to develop and introduce new products successfully or to achieve market acceptance of our new products, our operating results would be adversely affected.

We compete in markets characterized by technological advances and improvements in manufacturing efficiencies. Our ability to operate profitably depends in large part on our timely access to, or development of, technological advances, and on our ability to use those advances to improve existing products, develop new products and manufacture those products efficiently. There can be no assurance that we will realize financial benefit from our development programs, will continue to be successful in identifying, developing and marketing new products or enhancing our existing products, or that products or technologies developed by others will not render our products or technologies non-competitive or obsolete. The failure to introduce new or enhanced products on a timely and cost competitive basis, or to attain market acceptance for commercial products, could have a material adverse effect on our business, results of operations or financial condition.

If we are not successful in protecting our intellectual property rights, our ability to compete may be harmed.

We rely on a combination of patent, copyright, trademark and trade secret protections as well as confidentiality agreements and other methods, to protect our proprietary technologies and processes. For example, we enter into confidentiality agreements with our employees, consultants and business partners, and control access to and distribution of our proprietary information. We have been issued 12 United States patents and have 12 pending patent applications. However, despite our efforts to protect our intellectual property, we cannot assure that:

- ☐ The steps we take to prevent misappropriation or infringement of our intellectual property will be successful;
- ✘ Any existing or future patents will not be challenged, invalidated or circumvented;
- ✘ Any pending patent applications or future applications will be approved;
- Others will not independently develop similar products or processes to ours or design around our patents; or
- ✘ Any of the measures described above would provide meaningful protection.

A failure by us to meaningfully protect our intellectual property could have a material adverse effect on our business, financial condition, operating results and ability to compete. In addition, effective patent, copyright, trademark and trade secret protection may be unavailable or limited in certain countries.

From time to time we may be subject to lawsuits by other parties seeking to enforce their intellectual property rights. Any litigation could result in the expenditure of significant financial resources and the diversion of management's time and resources. In addition, litigation in which we are accused of infringement may have an impact on prospective customers, cause product delays, require us to develop non-infringing technology, make substantial payments to third parties or enter into royalty or license agreements, which may not be available on acceptable terms, or at all. If a successful claim of infringement were made against us and we could not develop non-infringing technology or license the infringed or similar technology on a timely and cost-effective basis, we may be forced to stop selling current products or abandon new products under development and we could be exposed to legal actions by our customers.

We depend on others, particularly on agencies of the United States government, for funding our research and development effort.

Most of our research and development work is funded by agencies of the United States government either directly or via their contractors. Any United States government budgetary cuts may materially adversely effect our outside funding for research and development. Loss of outside funding may materially adversely affect our ability to further develop our proprietary technologies and to apply these technologies to our current products and products under development. If we are unable to maintain our current level of such funding for any reason, we would need to generate funds for such research from other sources, reduce our research and development effort or increase our internal funding for research and development. An increase in internally funded research and development would have a negative impact on our profitability.

Additionally, the process of bidding for, obtaining, retaining and performing United States government contracts is subject to a large number of United States government regulations and oversight requirements. Compliance with these government regulations requires extensive record keeping and the maintenance of complex policies and procedures relating to all aspects of our business, as well as to work performed for us by any subcontractors. Any failure to comply with applicable regulations, or to require our subcontractors so to comply, could result in a variety of adverse consequences, ranging from remedial requirements to termination of contracts, reimbursement of fees, reduction of fees on a going forward basis and prohibition from obtaining future United States government contracts. While we believe that we have in place systems and personnel to ensure compliance with all United States government regulations relating to contracting, we cannot assure that we will at all times be in compliance or that any failure to

comply will not have a material adverse effect on our business, results of operations or financial condition.

The U.S. government has certain rights relating to our intellectual property.

The United States government retains the right to obtain a patent on any invention developed under government contracts as to which we do not seek and obtain a patent, and may require us to grant a third party license of such invention if steps to achieving practical application of the invention have not been taken. The United States government also retains a non-exclusive, royalty-free, non-transferable license to all technology developed under government contracts, whether or not patented, for government use, including use by other parties to United States government contracts. Furthermore, our United States government contracts prohibit us from granting exclusive rights to use or sell any inventions unless the grantee agrees that any product using the invention will be manufactured substantially in the United States.

Our success depends on our ability to hire and retain qualified technical personnel, and if we are unable to do so, our product development efforts and customer relations will suffer.



Our products require sophisticated manufacturing, research and development, marketing and sales, and technical support. Our success depends on our ability to attract, train and retain qualified technical personnel in each of these areas. Competition for personnel in all of these areas is intense and we may not be able to hire or retain sufficient personnel to achieve our goals or support the anticipated growth in our business. The market for the highly trained personnel we require is very competitive, due to the limited number of people available with the necessary technical skills and understanding of our products and technology. If we fail to hire and retain qualified personnel, our product development efforts and customer relations will suffer.

We are subject to environmental laws and other legal requirements that have the potential to subject us to substantial liability and increase our costs of doing business.

Our properties and business operations are subject to a wide variety of federal, state, and local environmental, health and safety laws and other legal requirements, including those relating to the storage, use, discharge and disposal of toxic, volatile or otherwise hazardous substances used in our manufacturing processes. We cannot assure that these legal requirements will not impose on us the need for additional capital expenditures or other requirements. If we fail to obtain required permits or otherwise fail to operate within these or future legal requirements, we may be required to pay substantial penalties, suspend our operations or make costly changes to our manufacturing processes or facilities. Although we believe that we are in compliance and have complied with all applicable legal requirements, we may also be required to incur additional costs to comply with current or future legal requirements.

New regulations related to "conflict minerals" may force us to incur additional expenses and face reputational challenges.

In August 2012, the SEC adopted its final rule to implement Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act regarding disclosure and reporting requirements for companies who use "conflict" minerals mined from the Democratic Republic of Congo and adjoining countries in their products. The first reporting period is calendar year 2013 with the first report due by May 31, 2014. Depending on our conflict minerals source designation, we may be able to delay our first report for up to four additional years. These new requirements could adversely affect our ability to source related minerals and metals and increase our related costs. We may face difficulties and increased expense associated with complying with the disclosure requirements, such as costs related to determining the existence and source of any conflict minerals used in our products. Also, because our supply chain is complex, and some suppliers may be unwilling to share related confidential information regarding the source of their products, we may face reputational challenges if we are unable to sufficiently verify the existence or origins of the subject minerals and metals.

Our international sales subject us to risks that could adversely affect our revenue and operating results.

Sales to customers located outside the U.S. have historically accounted for a significant percentage of our revenue (approximately 34% in 2013) and we anticipate that such sales will continue to be a significant percentage of our revenue. International sales involve a variety of risks and uncertainties, including but not limited to risks related to:

- Reliance on strategic alliance partners such as representatives and licensees;
- Compliance with changing foreign regulatory requirements and tax laws;
- Reduced protection for intellectual property rights in some countries;
- Longer payment cycles to collect accounts receivable in some countries;
- Increased costs or reduced revenues as a result of movements in foreign currency exchange rates;
- Political instability;

- Economic downturns in international markets;
- Strengthening of the United States dollar may negatively impact our foreign customers ability to purchase our products and services.
- Trade barriers such as export requirements, tariffs, taxes and other restrictions and expenses, which could increase the prices of our products and make our product offering less competitive in some countries; and
- Changing restrictions imposed by United States export laws.

Failure to successfully address these risks and uncertainties could adversely affect our international sales, which could in turn have a material and adverse effect on our results of operations and financial condition.

The global nature of our revenue subjects us to the legal systems of the international countries in which we offer and sell our products.

We offer and sell our products internationally which accounted for 34% and 53% of net sales and revenue for 2013 and 2012, respectively. As such, we are or could become subject to the laws and regulations of the jurisdictions in which we conduct

business. Laws and regulations include but are not limited to health and safety and environmental regulations, which are specific to the countries in which we sell our products. Accordingly we design our equipment to ensure their compliance with all applicable known standards. Continued compliance to satisfy ever changing legal and regulatory requirements, may cause us to incur additional costs leading to margin erosion. Accordingly, foreign laws and regulations which are applicable to us may have a material adverse effect on our business, financial condition, operating results, cash flow and future prospects.

As a result of the laws and regulations of the foreign jurisdictions in which we carry on business, we may experience difficulty in enforcing customer purchase and sale agreements or certain provisions included therein including but not limited to product warranty which is normally provided to our customers. The inability to enforce our contractual rights in foreign jurisdictions may have a material adverse effect on our business, financial condition, operating results, cash flow and future prospects.

The use of our medical related products, as well as our photovoltaic module manufacturing equipment, entails a risk of physical injury; the defense of claims arising from such risk may exceed our insurance coverage and distract our management.

Through our variable interest entity, N2 Biomedical LLC, the use of orthopedic and other medical devices may entail a risk of physical injury to patients. To the extent we fail to meet the manufacturers' specifications in performing our biomedical processing services, we may be exposed to potential product liability and other damage claims. We have had cases brought against us as a supplier of services with other defendants over the alleged manufacture and sale of defective heart valves. In the past, we have settled a case alleging that our catheter contributed to a patient's death in Ohio. Further, in 2010 we concluded a voluntary recall of certain hemodialysis catheters as the manufacturer of record due to a vendor molding issue. While no claims of product liability or other damages have been initiated against us due to the recall, this does not preclude such an event occurring as we have recalled only unused inventory held by distributors and hospitals. Even though we have completed the sale of our catheter product line to Bard, we are still the manufacturer of record of catheters implanted in patients, we are still responsible for those devices that we manufactured and are still liable for any recalls of any of these devices in the future. Furthermore, the use of our photovoltaic module manufacturing equipment could result in operator injury. We maintain product liability and umbrella insurance coverage; however, there can be no assurance that any product liability claim assessed against us would not exceed our insurance coverage, or that insurance coverage would continue to be available. While we typically obtain agreements of indemnity from manufacturers of biomedical products for which we provide manufacturing services, there can be no assurance that any such indemnity agreements will be enforceable or that such manufacturers will have adequate funds to meet their obligations under such agreements. The cost of defending a product liability, negligence or other action, and/or assessment of damages in excess of insurance coverage, could have a material adverse effect on our business, results of operations, or financial condition.

As we seek to expand our business globally, growth opportunities may be impacted by greater political, economic and social uncertainty and the continuing and accelerating globalization of businesses could significantly change the dynamics of our competition, customer base and product offerings.

Our efforts to grow our businesses depend to a large extent upon access to, and our success in developing market share and operating profitably in additional geographic markets including but not limited to South America, Middle East, China, Africa and India. In some cases, these countries or regions have greater political and economic volatility, greater vulnerability to infrastructure and labor disruptions and differing local customer product preferences and requirements than our other markets. Operating and seeking to expand business in a number of different regions and countries exposes us to multiple and potentially conflicting cultural practices, business practices and legal and regulatory requirements that are subject to change, including those related to tariffs and trade barriers, investments,

property ownership rights, taxation and repatriation of earnings and advanced technologies. Expanding business operations globally also increases exposure to currency fluctuations which can materially affect our financial results. As these emerging geographic markets become more important to us, our competitors are also seeking to expand their production capacities and sales in these same markets. While we maintain a positive corporate image and our brand is widely recognized and valued in its traditional markets, the brand is less well known in some emerging markets which could impede our efforts to successfully compete in these markets. Although we are taking measures to adapt to these changing circumstances, our reputation and/or business results could be negatively affected should these efforts prove unsuccessful.

We may incur material costs related to extended product warranties, which could have a material adverse impact on our financial condition and results of operations.

From time to time, we have offered an extended warranty period to our customers for our manufactured equipment. These extended warranties may lengthen the life of the equipment along with incurring additional cost to maintain the customers' equipment which may negatively impact profitability. Photovoltaic manufacturers are increasingly requiring their capital equipment vendors to offer extended warranty periods for their capital equipment purchases. Warranty claims may range from individual components being replaced to complicated electronic and software PC boards being rebuilt. We cannot assure you that costs associated with providing extended product warranties will not will not exceed amounts accrued for in our consolidated financial statements.

## Risks Related to Our Company

Our Company is subject to significant influence by principal stockholder.

Roger G. Little, our founder and Chairman of the Board, controls approximately 33% of our outstanding common stock. As a result, Mr. Little is in a position to exert significant influence over actions which require stockholder approval and generally to direct our affairs, including the election of directors, potential acquisitions and sales or otherwise preventing or delaying changes in control of our Company that may be otherwise viewed as beneficial by shareholders other than Mr. Little.

We do not pay dividends and we may not pay dividends in the future.

We have paid no cash dividends since our inception. We anticipate retaining any future earnings for reinvestment in operations and do not anticipate that dividends will be paid in the foreseeable future. Accordingly, the return on investment should be expected to depend on changes in the market price of our common stock.

The market price for our common stock has been volatile and future volatility could cause the value of investments in our Company to fluctuate.

Our stock price has experienced significant volatility. We expect that uncertainty regarding demand for our products will cause our stock price to continue to be volatile. In addition, the value of your investment could decline due to the impact of any of the following factors, among others, upon the market price of our common stock:

- Overall economic conditions and general market volatility;
- Changes in investment analysts' estimates of our revenues and operating results;
- Our failure to meet investment analysts' performance expectations; and
- Changes in market valuations of other companies in the alternative energy or biomedical industries.

In addition, many of the risks described elsewhere in this section could materially and adversely affect our stock price, as discussed in those risk factors. U.S. financial markets have recently experienced substantial price and volume volatility. Fluctuations such as these have affected and are likely to continue to affect the market price of our common stock.

We were recently delisted from the Nasdaq Capital Market, which could result in a number of negative implications. In July 2013, our common stock was delisted from the Nasdaq Capital Market. As a result, there could be a number of negative implications, including further reductions in our stock price, reduced liquidity in the common stock as a result of the loss of market efficiencies associated with a national securities exchange, the loss of federal preemption of state securities laws, the potential loss of confidence by suppliers, customers and employees, as well as the loss of analyst coverage and institutional investor interest, fewer business development opportunities and greater difficulty in obtaining financing.

The consolidation of N2 Biomedical LLC, a variable interest entity, could make it more difficult to understand the operating performance of our company and create operational risks for our company.

Under current applicable accounting rules, we are required to consolidate the operations of N2 Biomedical LLC ("N2 Bio"), a variable interest entity or "VIE" because we are the primary beneficiary of the VIE. This consolidation could make it difficult for an investor to differentiate the assets, liabilities, and results of operations of our company apart from the assets, liabilities, and results of operations of the VIE. The assets of N2 Bio are not available to meet our

liquidity requirements and similarly we generally have not guaranteed or assumed any obligation for repayment of the liabilities of the VIE.

Some of the requirements of Sarbanes-Oxley affect us as a small company disproportionately, and we may not be able to comply in a timely manner despite substantial effort and expense.

The Sarbanes-Oxley Act of 2002 imposed many new requirements on public companies, the most significant of which involves the documentation, testing and reporting of the effectiveness of our internal control over financial reporting.

We are required to report on our assessment of the effectiveness of our internal control over financial reporting in this Annual Report on Form 10-K. We have documented and tested our internal controls in 2013 and 2012 and this effort involved substantial time and expense. Based on our evaluation under the framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission, management of our Company concluded that our internal control over financial reporting was effective as of December 31, 2013. Because of its inherent limitations, internal control

over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our credit agreements subject us to various restrictions, which may limit our ability to pursue business opportunities.

Our credit agreements subject us to various restrictions on our ability to engage in certain activities without the prior written consent of the bank, including, among other things, our ability to:

- ◆ Dispose of or encumber assets, other than in the ordinary course of business,
- ◆ Incur additional indebtedness,
- ◆ Merge or consolidate with other entities, or acquire other businesses, and
- ◆ Make investments.

The agreements also subject us to various financial and other covenants with which we must comply on an ongoing or periodic basis. As long as any commitment remains outstanding under the credit agreements, we must comply with a financial covenant, whereby we must maintain a minimum cash balance and availability line of credit. If we violate these or any other covenants, any outstanding debt under these agreements could become immediately due and payable, the bank could proceed against any collateral securing indebtedness and our ability to borrow funds in the future may be restricted or eliminated. These restrictions may also limit our ability to pursue business opportunities or strategies that we would otherwise consider to be in the best interests of the company.

Our credit agreement with Silicon Valley Bank is due to expire on April 30, 2014 and our variable interest entity's (N2 Biomedical LLC) credit agreement with Middlesex Savings Bank is due to expire on September 18, 2014, which may adversely affect our working capital.

If our credit agreements with Silicon Valley Bank and Middlesex Savings Bank are not renewed, we would have to pay down the credit facilities balance at that time, reducing our cash and cash equivalents balance.

We recognize revenue in accordance with various complex accounting standards, and changes in circumstances or interpretations may lead to accounting adjustments.

Our revenue recognition policies involve application of various complex accounting standards, including accounting guidance associated with revenue arrangements with multiple deliverables. Our compliance with such accounting standards often involves management's judgment regarding whether the criteria set forth in the standards have been met such that we can recognize as revenue the amounts that we receive as payment for our products or services. We base our judgments on assumptions that we believe to be reasonable under the circumstances. However, these judgments, or the assumptions underlying them, may change over time. Changes in circumstances or third-party guidance could cause our judgment to change with respect to our interpretations of these complex standards, and transactions recorded, including revenue recognized, for one or more prior reporting periods, which could be adversely affected.

#### Item 1B. Unresolved Staff Comments

None.

#### Item 2. Properties

Our corporate headquarters are located at One Patriots Park, Bedford, Massachusetts. This facility is leased and contains our administrative offices, sales and marketing offices, research and development facilities and the manufacturing facilities of our biomedical and solar businesses. Our related party lease which represents approximately 116,826 square feet at One Patriots Park, Bedford, Massachusetts expires in November 2017. The related party lease for our variable interest entity, N2 Biomedical LLC, which represents approximately 27,404 square feet at One Patriots Park, Bedford, Massachusetts expires in November 2020. We believe that our facilities are suitable for their present intended purposes and adequate for our current level of operations.

Prior to the sale of the Semiconductor Business Unit, we leased an approximately 90,000 square foot facility in Hudson, New Hampshire for the Semiconductor Business Unit. In connection with sale of this business, the lease was terminated on March 9, 2012 and we were released from all future obligations under the lease as of that date. See Note 18 to the consolidated financial statements.

Item 3. Legal Proceedings

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From time to time, we are subject to legal proceedings and claims arising from the conduct of our business operations.

On February 4, 2011, Silicon International Ltd. ("SI") filed a complaint in Suffolk Superior Court in Massachusetts, and on February 11, 2011 served a summons, against us alleging breach of contract related to SI's activities acting as a former sales and service representative of ours within China. The complaint makes claims regarding amounts allegedly owed to SI by us, specifically with regard to allegedly owed commissions. SI is seeking payment of commissions allegedly owed to it. We filed our answer and counterclaims against SI on February 24, 2011, denying SI's allegations, and claiming that SI interfered in our business relationships and generally engaged in multiple breaches of contract against us. In January 2013, both parties filed formal opposition to the opposing parties' motion to dismiss various claims and allegations. In July 2013, the court denied our motion and allowed in part and denied in part the plaintiff's motion. A trial date has been scheduled for April 2014. The ultimate outcome of this legal matter cannot be predicted with certainty, based on current information, including our assessment of the merits of the particular claim. It is not possible at this time to provide meaningful estimates as to amount or range of potential loss, but we do not expect that these legal proceedings or claims will have any material adverse affect on our future results of operations, financial position or cash flows.

On December 10, 2013, Stifel, Nicolaus & Company, Inc. ("Stifel") filed a complaint in the Southern District of New York Court, and on December 18, 2013, served a summons, against us alleging breach of contract related to Stifel's activities acting as an investment banker for us. The complaint makes claims regarding amounts allegedly owed to Stifel by us, specifically with regard to allegedly owed fees for certain advisory services which amounts have been provided for. On December 12, 2013, we filed a complaint in Middlesex Superior Court in Massachusetts, and on December 31, 2013, served a summons against Stifel alleging breach of contract related to Stifel's activities acting as an investment banker for us. Our complaint makes claims regarding Stifel providing certain advisory services to us. The ultimate outcome of this legal matter cannot be predicted with certainty, based on current information, including our assessment of the merits of the particular claim. It is not possible at this time to provide meaningful estimates as to amount or range of potential loss, but we do not expect that these legal proceedings or claims will have any material adverse effect on our future results of operations, financial position or cash flows.

We are not aware of any other current or pending legal proceedings to which we are or may be a party that we believe could materially adversely affect our results of operations or financial condition or cash flows.

#### Item 4. Mine Safety Disclosures

Not applicable

## PART II

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

## Market Information

Until July 3, 2013, our common stock traded on the Nasdaq Capital Market. Our common stock is currently quoted on the OTCQB tier of the OTC Markets under the symbol “SPIR.” The following chart sets forth the high and low sales prices for the common stock for the periods shown:

	High Sale	Low Sale
2013		
First Quarter	\$0.99	\$0.48
Second Quarter	0.85	0.50
Third Quarter	0.54	0.11
Fourth Quarter	0.80	0.43
2012		
First Quarter	\$1.70	\$0.63
Second Quarter	1.16	0.38
Third Quarter	0.68	0.46
Fourth Quarter	0.60	0.33

These prices do not reflect retail mark-ups, markdowns or commissions and may not reflect actual transactions. The closing price of the common stock on March 25, 2014 was \$1.06 and on that date, there were 224 shareholders of record. The number of holders does not include individuals or entities who beneficially own shares but whose shares are held of record by a broker or clearing agency, but does include each such broker or clearing agency as one record holder.

## Dividends

We did not pay any cash dividends during 2013 or 2012 and currently do not intend to pay dividends in the foreseeable future so that we may reinvest our earnings in the development of our business. The payment of dividends in the future will be at the discretion of the Board of Directors. In addition, under our credit agreements with Silicon Valley Bank and Middlesex Savings Bank, we may not pay dividends on our common stock without the consent of the bank.

## Item 6. Selected Financial Data

Not required as we are a smaller reporting company.

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

This Management’s Discussion and Analysis of Financial Condition and Results of Operations section and other parts of this Report contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), which statements involve risks and uncertainties. These statements relate to our future plans, objectives,

expectations and intentions. These statements may be identified by the use of words such as “may”, “could”, “would”, “should”, “will”, “expects”, “anticipates”, “intends”, “plans”, “believes”, “estimates”, and similar expressions, and includes statements regarding the expected growth of the solar market, the potential impact of pending litigation on our results, and the sufficiency of cash resources in 2014. Our actual results and the timing of certain events may differ significantly from the results and timing described in the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those factors described below and above under “Item 1A. Risk Factors” and “Item 1. Business.” Readers are encouraged to carefully review those risk factors. The following discussion and analysis of our financial condition and results of operations should be read in light of those factors and in conjunction with our accompanying Consolidated Financial Statements, including the Notes thereto.

## Overview

We and our subsidiaries along with our variable interest entity develop, manufacture and market highly-engineered products and services in two principal business areas: (i) capital equipment and systems for the photovoltaic solar industry and (ii) biomedical, through our variable interest entity, N2 Biomedical LLC ("N2 Bio"), generally bringing to bear expertise in materials technologies, surface science and thin films across both business areas, as discussed below.

In the photovoltaic solar area, we develop, manufacture and market specialized equipment for the production of terrestrial photovoltaic modules from solar cells and provide photovoltaic systems for grid connected applications in the commercial markets. Our equipment has been installed in approximately 200 factories in 50 countries. The equipment market is very competitive with major competitors located in the U.S., Japan and Europe. Our flagship product is our Spi-Sun simulator which tests module performance. Our other product offerings include turn-key module lines and to a lesser extent other individual equipment. To compete we offer other services such as training and assistance with module certification. We also provide turn-key services to our customers to backward integrate to solar cell manufacturing.

In the biomedical area, through our variable interest entity, N2 Bio, we provide value-added surface treatments to manufacturers of orthopedic and other medical devices that enhance the durability, antimicrobial characteristics or other material characteristics of their products, and perform sponsored research programs into practical applications of advanced biomedical technologies.

#### Transactions

On September 18, 2013, we, Spire Biomedical, Inc. (the "Subsidiary" and together with us, "Spire Bio") entered into an Asset Purchase Agreement (the "Purchase Agreement") with N2 Bio pursuant to which N2 Bio agreed to (i) acquire substantially all of the assets of the Subsidiary's biomedical business (the "Bio Business Unit") and (ii) assume and pay certain liabilities related to the purchased assets as set forth in the Purchase Agreement (collectively, the "Transaction"). The Transaction closed on September 18, 2013. The purchase price for the Bio Business Unit was \$10.5 million plus the assumption of liabilities of approximately \$100 thousand, with \$6.0 million paid in cash at closing, a \$2.4 million subordinated convertible promissory note, and 310,549 Series A Convertible Preferred Units of N2 Bio valued at approximately \$2.1 million (\$6.72 per share). The assets and liabilities of the Subsidiary's biomedical business are under common control and were recorded at carryover basis for financial reporting. The difference between the consideration paid and the carrying value of the assets and liabilities acquired by N2 Bio was recorded as a deemed dividend by us in the amount of \$9.5 million and has been eliminated in consolidation. Mark C. Little was the Chief Executive Officer of the Subsidiary, is a member of our Board of Directors and is the Chief Executive Officer of N2 Bio. Mark C. Little is the son of Roger G. Little, our Chairman of the Board. Roger G. Little is also a member of the Board of Directors of N2 Bio.

We have determined that N2 Bio is a VIE because the equity investment at risk from the majority shareholders of N2 Bio is not sufficient to permit N2 Bio to finance its activities without additional subordinated financial support. As discussed above, N2 Bio is subject to a subordinated convertible promissory note due to us. Additionally, Mark Little is the Chief Executive Officer of N2 Bio and also is a member of our Board of Directors. We have also determined that we have the obligation to absorb losses and the right to receive benefits from N2 Bio that could potentially be significant to it. Therefore, we have determined that N2 Bio is a VIE and that we are a primary beneficiary of the VIE and must consolidate the financial condition, results of operations and cash flows of N2 Bio with those of our own. See Note 19 to the consolidated financial statements.

The subordinated convertible promissory note (i) bears interest at 9% per annum until paid in full, (ii) is convertible, at our option, into Common Units of N2 Bio at a conversion price of \$6.72 per share, (iii) has a seven year term, (iv) is unsecured and (v) is subordinate in right of payment to all senior bank indebtedness of N2 Bio.

The Series A Convertible Preferred Units (i) represent an equity ownership interest of 19.9% in N2 Bio, (ii) are governed by the terms of the Amended and Restated Limited Liability Company Agreement of N2 Bio dated September 18, 2013, (iii) rank senior to the Common Units on liquidation, dissolution and winding up, and (iv) vote together with the Common Units on an as-converted basis. We have the right to appoint one director to the Board of Directors of N2 Bio. N2 Bio is subject to certain affirmative and negative operating covenants in favor of the holder of Series A Preferred Units.

On September 18, 2013, we and N2 Bio entered into a Shared Services Agreement whereby we will provide N2 Bio certain services (the "Shared Services") for a period of three years. It is the intent of the parties that the aggregate fees for the Shared Services shall equal approximately \$500,000 during the first year. Following the first anniversary, N2 Bio may terminate any specific Shared Service with 20 days' written notice to us.

On September 18, 2013, the lease agreement between SPI-Trust, a related party, and us for the premises in Bedford, Massachusetts where the Business is located was amended, by reducing our leased space and annual base rent by approximately 19%. All other material terms and conditions related to the lease remain unchanged as of such date.

On September 18, 2013, N2 Bio entered into a Lease Agreement (the "N2 Bio Bedford Lease") with SPI-Trust with respect to 27,048 square feet of space in the premises in Bedford, Massachusetts. The term of the N2 Bio Bedford Lease commenced on September 18, 2013 and is set to expire on November 30, 2020. The annual rental rate prorated for September 18, 2013 to November 30, 2013 is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on December 1, 2013 and each anniversary thereafter by \$0.50 per square foot.

The Purchase Agreement includes a five-year commitment of (i) us not to compete with the Bio Business Unit services and (ii) N2 Bio not to compete with our consumer electronic products business. We and N2 Bio both agreed not to solicit the officers or employees of the other party for a one-year period.

On March 9, 2012, we completed the sale of our semiconductor business unit, which provided semiconductor foundry services, operated a semiconductor foundry and fabrication facility and was engaged in the business of wafer epitaxy, foundry services, and device fabrication for the defense, medical, telecommunications and consumer products markets (the "Semiconductor Business Unit"), to Masimo Corporation ("Masimo"). Accordingly, the results of operations and assets and liabilities of the Semiconductor Business Unit are being presented herein as discontinued operations. See Note 18 to the consolidated financial statements.

## Results of Operations

The following discussions of our results of continuing operations exclude the results related to the Medical Products Business Unit and the Semiconductor Business Unit, which were sold on December 14, 2009 and March 9, 2012, respectively. The Medical Products Business Unit and the Semiconductor Business Unit have been segregated from continuing operations and are reflected as discontinued operations for all periods presented. See "Net income (loss) from discontinued operations, net of tax" below and Note 18 to the consolidated financial statements.

The following table sets forth certain items as a percentage of net sales and revenues for the periods presented:

	Year Ended December 31,			
	2013		2012	
Net sales and revenues	100	%	100	%
Cost of sales and revenues	(83	)	(76	)
Gross margin	17		24	
Selling, general and administrative expenses	(74	)	(53	)
Internal research and development expenses	—		(1	)
Gain on termination of contracts	—		—	
Operating loss from continuing operations	(57	)	(30	)
Other expense, net	(1	)	—	
Loss from continuing operations before income tax benefit	(58	)	(30	)
Income tax benefit - continuing operations	—		9	
Net loss from continuing operations	(58	)	(21	)
Net income from discontinued operations, net of tax	—		13	
Net loss	(58	)	(8	)
Less: Net loss attributable to noncontrolling interest	—		—	
Net loss attributable to common stockholders	(58	)%	(8	)%

#### Overall

Our total net sales and revenues for the year ended December 31, 2013 (“2013”) decreased 34% to \$14.6 million as compared to \$22.1 million for the year ended December 31, 2012 (“2012”). The decrease was primarily attributable to a \$7.6 million decrease in solar revenue, partially offset by a slight increase in biomedical revenue.

#### Solar Business Unit

Sales in our solar business unit decreased 50% to \$7.7 million in 2013 as compared to \$15.3 million in 2012. The decrease in solar business unit revenue is primarily the result of a decrease in solar module equipment revenue of \$7.6 million and a decrease in solar research and development revenue of \$1.0 million, partially offset by an increase in equipment research and development revenue of \$689 thousand and an increase in solar systems revenue of \$562 thousand. Lower government incentives in the photovoltaic market and the world-wide oversupply of photovoltaic modules relative to market demand has led to precipitously declining prices in the photovoltaic market. The oversupply has also resulted in reduced demand for photovoltaic manufacturing equipment that will not improve until the module supply/demand imbalance is rectified by growth in photovoltaic systems market. Our Solar Business Unit has been negatively impacted by this reduction in demand which is contributing to decreased revenue in our solar business unit.

#### Biomedical Business Unit

Revenues in our biomedical business unit, including the results of N2 Bio, our variable interest entity, subsequent to September 18, 2013, remained constant at \$6.9 million in 2013 when compared to 2012. The increase was primarily attributable to an increase in orthopedics coating services revenue of \$293 thousand, partially offset by a decrease in biomedical research and development revenue of \$218 thousand.

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Year Ended December 31, 2013 Compared to Year Ended December 31, 2012

Net Sales and Revenues

The following table categorizes our net sales and revenues for the periods presented:

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(in thousands)	Year Ended December 31,		Decrease	
	2013	2012	\$	%
Sales of goods	\$5,734	\$12,989	\$(7,255)	(56)%
Contract research and service revenues	8,847	9,121	(274)	(3)%
Net sales and revenues	\$14,581	\$22,110	\$(7,529)	(34)%

The 56% decrease in sales of goods for 2013 as compared to 2012 was primarily due to a decrease of \$7.6 million in solar module manufacturing equipment revenues and a decrease of \$185 thousand in ATC Lab revenues, partially offset by an increase of \$562 thousand in solar systems revenues. The decrease in solar module equipment sales of 61% in 2013 as compared to 2012 was primarily due to a decrease in individual module equipment units delivered in 2013. The decrease in ATC lab revenue of 39% in 2013 as compared to 2012 was primarily due to the completion of three large projects benefiting 2012. The increase in solar systems revenue of 752% in 2013 as compared to 2012 was primarily due to the completion of two solar system projects in 2013. Lower government incentives in the photovoltaic market and the world-wide oversupply of photovoltaic modules relative to market demand has led to precipitously declining prices in the photovoltaic market. The oversupply has also resulted in reduced demand for photovoltaic manufacturing equipment that will not improve until the module supply/demand imbalance is rectified by growth in the photovoltaic systems market. Our Solar Business Unit has been negatively impacted by this reduction in demand which is contributing to decreased sales of goods.

The 3% decrease in contract research and service revenues for 2013 as compared to 2012 was primarily attributable to an decrease of \$1.0 million in solar research and development revenue and a decrease of \$218 thousand in biomedical research and development revenue, partially offset by an increase of \$689 thousand in equipment research and development revenue and an increase of \$293 thousand in biomedical service revenue. The decrease in solar research and development revenue of 66% in 2013 as compared to 2012 was primarily due to the completion of three research and development projects in the first and third quarter of 2013 and the second quarter of 2012. The decrease in biomedical research and development revenue of 67% in 2013 as compared to 2012 was primarily due to the completion of two research and development projects in the second and fourth quarter of 2012. The increase in equipment research and development revenue of 98% in 2013 as compared to 2012 was primarily due to new research and development projects starting in the end of the third quarter of 2012. Revenues from our biomedical services increased 5% in 2013 compared to 2012 as a result of an increase in revenue from two large customers in 2013.

Revenues from the delivery of biomedical services to Stryker Orthopedics and Biomet Inc. accounted for 20% and 12%, respectively, of total net sales and revenues for 2013.

Revenues from the delivery biomedical services to Stryker Orthopedics and revenues from the delivery of solar equipment to First Solar, Inc. accounted for 14% and 12%, respectively, of total net sales and revenues for 2012.

#### Cost of Sales and Revenues

The following table categorizes our cost of sales and revenues for the periods presented, stated in dollars and as a percentage of related sales and revenues:

(in thousands)	Years Ended December 31,				Decrease	
	2013	%	2012	%	\$	%
Cost of goods sold	\$7,514	131%	\$11,943	92%	\$(4,429)	(37)%

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Cost of contract research and services	4,561	52	%	4,896	54	%	(335	)	(7	)	%
Net cost of sales and revenues	\$12,075	83	%	\$16,839	76	%	\$(4,764	)	(28	)	%

Cost of goods sold decreased 37% for 2013 as compared to 2012, primarily due to a decrease of \$4.7 million in costs related to solar module equipment and a decrease of \$110 thousand in costs related to the ATC lab, partially offset by an increase of \$377 thousand in costs related to solar systems. The decrease in solar module equipment costs of 42% in 2013 as compared to 2012 was primarily due to a decrease in associated revenue. The decrease in ATC lab costs of 28% in 2013 as compared to 2012 was primarily due to a decrease in associated revenue. The increase in solar system costs of 142% in 2013 as compared to 2012 was primarily due to the delivery of two solar system projects in 2013. As a percentage of sales, cost of goods sold increased to 131% of sales of goods in 2013 as compared to 92% of sales of goods in 2012. This increase in the percentage of sales in 2013 is due

primarily to a decline in sales of higher margin equipment in 2013 and to a lesser extent, lower indirect costs not sufficient to offset the amount of overhead absorbed due to the reduction in sales volume, partially offset by the delivery of 2 high margin solar system projects in 2013.

Cost of contract research and services decreased 7% for 2013 as compared to 2012, primarily due to a decrease of \$439 thousand in costs related to solar research and development services and \$157 thousand in costs related to biomedical research and development services, partially offset by an increase of \$227 thousand in costs related to equipment research and development services. The decrease in solar research and development services costs of 62% in 2013 as compared to 2012 was primarily due to a reduction in direct costs related to the completion of three projects. The decrease in biomedical research and development costs of 34% in 2013 as compared to 2012 was primarily due to reductions in indirect costs related to the completion of two projects and the reduction of indirect employee related costs. The increase in equipment research and development services costs in 2013 as compared to 2012 was primarily due to new equipment research and development projects starting in the end of the third quarter of 2012. Cost of contract research and services as a percentage of related revenue decreased to 52% of related revenues in 2013 from 54% in 2012. This decrease in the percentage of sales in 2013 is primarily due to higher margin from new equipment research and development projects starting in the end of the third quarter of 2012.

Cost of sales and revenues also includes approximately \$18 thousand and \$52 thousand of share-based compensation in 2013 and 2012, respectively.

#### Operating Expenses

The following table categorizes our operating expenses for the periods presented, stated in dollars and as a percentage of net sales and revenues:

(in thousands)	Years Ended December 31,				Decrease	
	2013	%	2012	%	\$	%
Selling, general and administrative	\$10,851	74	\$11,676	53	\$(825)	(7)%
Internal research and development	31	—	233	1	(202)	(87)%
Operating expenses	\$10,882	75	\$11,909	54	\$(1,027)	(9)%

#### Selling, General and Administrative Expenses

Selling, general and administrative expense decreased 7% in 2013 as compared to 2012, primarily as a result of a decrease in employee related expenses due to a reduction in workforce and reduced marketing and agent commissions in the solar business unit, partially offset by transaction related costs associated with the N2 Biomedical transaction in the third quarter of 2013 (see Note 19 to the consolidated financial statements). In addition, a net expense was realized related to the change in value of the deferred compensation plan. Selling, general and administrative expense increased to 74% of sales and revenues in 2013 as compared to 53% in 2012. The increase was primarily due to the decrease in sales and revenues.

Selling, general and administrative expenses include approximately \$82 thousand and \$150 thousand of share-based compensation in 2013 and 2012, respectively.

#### Internal Research and Development Expenses

Internal research and development expense decreased 87% in 2013 as compared to 2012, primarily as a result of lower levels of research and development spent in the solar group. As a percentage of sales and revenue, internal research and development expenses decreased slightly in 2013 when compared to 2012.

#### Gains on Termination of Contracts

In the fourth quarter of 2012, we determined that a purchase and sale agreement, as amended, with Evergreen Solar Systems India (P) Ltd. ("Evergreen") related to a module manufacturing line expansion was terminated due to a breach of contract by Evergreen. Evergreen had failed to make payments as required by the agreement and has not responded to numerous communications by us. In the fourth quarter of 2012, we recognized a gain on termination of contracts of \$35 thousand which relates to Evergreen's non-refundable deposit. See Note 17 to the consolidated financial statements.

#### Other Expense, Net

We incurred interest expense of \$138 thousand and \$120 thousand in 2013 and 2012, respectively. The increase in interest expense is due to increased debt related to the term note with Middlesex Savings Bank retained in the third quarter of 2013 (see

Note 7 to the consolidated financial statements). We had currency exchange losses of \$9 thousand and \$7 thousand in 2013 and 2012, respectively.

#### Income Taxes

We recorded a state income tax benefit from continuing operations of \$2 thousand in 2013. We recorded an income tax benefit on our loss from continuing operations of \$2.0 million in 2012, which was offset by a provision on our income from discontinued operations of \$1.9 million in 2012. Gross federal net operating loss carryforwards were approximately \$13.9 million as of December 31, 2013 and expire at various times through 2033. We have a full valuation allowance recorded against the net deferred tax assets at December 31, 2013 due to uncertainty regarding realization of these assets in the future.

#### Income from Discontinued Operations

During the first quarter of 2012, we began pursuing an exclusive sales process of our Semiconductor Business Unit. On March 9, 2012, we completed the sale of the Semiconductor Business Unit to Masimo. Accordingly, the results of operations and assets and liabilities of the Semiconductor Business Unit are being presented herein as discontinued operations.

During the second quarter of 2009, we began pursuing an exclusive sales process of our Medical Products Business Unit. On December 14, 2009, we completed the sale of the Medical Products Business Unit to Bard Access Systems, Inc. Accordingly, the results and liabilities of the Medical Products Business Unit are being presented herein as discontinued operations.

We recorded net income from discontinued operations of \$2.9 million in 2012. Included in discontinued operations for 2012 is a gain on sale of business unit to Masimo of \$5.4 million and an income tax provision of \$1.9 million. Included in the gain of \$5.4 million is proceeds received from Masimo of \$8.0 million, less assets and liabilities assumed by Masimo of \$2.1 million and legal and professional fees related to complete the sale of \$425 thousand. See Note 18 to the consolidated financial statements.

#### Net Loss

We reported a net loss of \$8.5 million and \$1.9 million for 2013 and 2012, respectively. Net loss increased approximately \$6.7 million, primarily due to a \$4.9 million decline in 2013 income from discontinued operations before tax and a \$3.0 million decline in 2013 solar business unit margin, partially offset by a \$1.0 million decline in 2013 operating expenses and improved margin in the biomedical business of \$197 thousand.

#### Net Loss Attributable to Noncontrolling Interest

We reported a net loss attributable to noncontrolling interest of \$44 thousand and zero for 2013 and 2012, respectively. Net loss attributable to noncontrolling interest represents 80.1% of N2 Bio's net loss for 2013 and all of N2 Bio's costs associated with the transaction. See Note 19 to the consolidated financial statements.

#### Net Loss Attributable to Common Stockholders

We reported net loss attributable to common stockholders of \$8.5 million and \$1.9 million for 2013 and 2012, respectively. Net loss attributable to common stockholders increased approximately \$6.6 million, primarily due to a

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\$4.9 million decline in 2013 income from discontinued operations before tax and a \$3.0 million decline in 2013 solar business unit margin, partially offset by a \$1.0 million decline in 2013 operating expenses, improved margin in the biomedical business of \$197 thousand and a reduction in net loss attributable to noncontrolling interest of \$44 thousand.

Liquidity and Capital Resources

(in thousands)	December 31, 2013	December 31, 2012	Increase (Decrease)		
			\$	%	
Cash and cash equivalents	\$3,986	\$3,030	\$956	32	%
Working capital	\$3,704	\$6,616	\$(2,912)	(44)	)%

Cash and cash equivalents increased due to cash provided by financing activities, partially offset by cash used in operating activities. The overall decrease in working capital is due to an increase in current liabilities, primarily accounts payable, current portion of term loan and advances on contracts in progress along with a decrease in inventories, accounts receivable and current assets of discontinued operations, partially offset by increased cash and cash equivalents and deferred cost of good sold. We have

historically funded our operating cash requirements using operating cash flow, proceeds from the sale and licensing of technology and assets and proceeds from the sale of equity securities.

There are no material commitments by us for capital expenditures. At December 31, 2013, our accumulated deficit was approximately \$24.4 million compared to accumulated deficit of approximately \$15.9 million as of December 31, 2012.

Operating results will depend upon revenue growth or decline and product mix, as well as the timing of shipments of higher priced products from our solar equipment line and delivery of research and development services. Export sales, which amounted to 34% and 53% of net sales and revenues for 2013 and 2012, respectively, continue to constitute a significant portion of our net sales and revenues.

Net cash used in operating activities was \$5.3 million in 2013, which includes \$150 thousand of cash used in operating activities of discontinued operations. Net cash used in operating activities was \$7.8 million in 2012, which includes \$1.7 million of cash used in operating activities of discontinued operations. See Note 18 to the consolidated financial statements. As of December 31, 2013, we had unrestricted cash and cash equivalents of \$4.0 million compared to \$3.0 million as of December 31, 2012.

We currently believe that our existing cash resources at December 31, 2013, will be sufficient to fund our operations into the second half of 2014; however, we cannot assure you of this. The maturity date of the Revolving Credit Facility and the Ex-Im Facility with Silicon Valley Bank is April 30, 2014. The maturity date of N2 Bio's Secured Revolving Demand Note with Middlesex Savings Bank is September 18, 2014.

As a result of the reported operating loss, cash used in operations and the upcoming expiration of the Silicon Valley Bank facilities, our independent registered public accounting firm expressed a substantial doubt about our ability to continue as a going concern in their report on our consolidated financial statements.

We have various options on how to fund future operational losses or working capital needs, including but not limited to sales of equity, bank debt, the sale or license of assets and technology, or joint ventures involving cash infusions, as we have done in the past; however, there are no assurances that we will be able to sell equity, obtain or access bank debt, sell or license assets or technology or enter into such joint ventures on a timely basis and at appropriate values. We have developed several plans including potential strategic alternatives, cost reduction efforts and expand revenue in other solar markets to offset a decline in business due to global economic conditions. Our inability to successfully implement our cost reduction strategies, expand revenue in other solar markets or to renew our credit facilities, could adversely impact our ability to continue as a going concern.

Based on the forecasts and estimates underlying our current operating plan, the financial statements do not include any adjustments that might be necessary if we are unable to continue as a going concern.

#### Loan Agreements

We have two separate credit facilities with Silicon Valley Bank (the "Bank" or "SVB"): (i) a Second Amended and Restated Loan and Security Agreement (as amended, the "Revolving Credit Facility") and (ii) an Amended and Restated Export-Import Bank Loan and Security Agreement (as amended, the "Ex-Im Facility") pursuant to which outstanding amounts under this facility are guaranteed by the Export-Import Bank of the United States (the "EXIM Bank"). The credit facilities provide an aggregate amount of \$1.5 million under both facilities, with up to \$1 million available under the Revolving Credit Facility and up to \$1.5 million available under the Ex-Im Facility. In addition, a guidance

line supports letters of credit in an aggregate amount of up to \$1.5 million through April 30, 2014. If we achieve certain levels of liquidity, based on cash on hand and availability under the credit facility, we will not be required to cash collateralize letters of credit issued under this guidance line.

On September 3, 2013, we entered into with the Bank (i) the Sixth Loan Modification Agreement amending certain terms of the Second Amended and Restated Loan and Security Agreement dated as of November 16, 2009 (as amended, the “Revolving Credit Facility”) and (ii) the Sixth Loan Modification Agreement amending certain terms of the Amended and Restated Export-Import Bank Loan and Security Agreement dated as of November 16, 2009 (as amended, the “Ex-Im Facility”). Pursuant to the terms of the Sixth Loan Modification Agreements, we agreed with the Bank to extend the maturity date of the Revolving Credit Facility and the Ex-Im Facility to October 29, 2013.

On November 18, 2013, we entered into with the Bank (i) the Seventh Loan Modification Agreement amending certain terms of the Second Amended and Restated Loan and Security Agreement dated as of November 16, 2009 (as amended, the “Revolving Credit Facility”) and (ii) the Seventh Loan Modification Agreement amending certain terms of the Amended and



Restated Export-Import Bank Loan and Security Agreement dated as of November 16, 2009 (as amended, the “Ex-Im Facility”). Pursuant to the terms of the Seventh Loan Modification Agreements, we agreed with the Bank to (i) extend the maturity date of the Revolving Credit Facility and the Ex-Im Facility from October 29, 2013 to April 30, 2014, (ii) effective November 18, 2013 amend the definition of the Financial Covenant by deleting the requirement to maintain liquidity of at least \$1.25 million at all times based on cash on hand and availability under the credit facility and replacing it with a newly defined covenant whereby we shall maintain cash on hand of at least \$2.5 million at all times, as long as any commitment remains outstanding under the facilities, and (iii) amend the definition of Streamline Facility Eligible to increase the liquidity requirement from \$2.5 million to \$3.5 million.

In addition, until all amounts under the credit facilities with the Bank are repaid, covenants under the credit facilities impose restrictions on our ability to, among other things, incur additional indebtedness, create or permit liens on our assets, merge, consolidate or dispose of assets (other than in the ordinary course of business), make dividend and other restricted payments, make certain debt or equity investments, make certain acquisitions, engage in certain transactions with affiliates or change the business conducted by us. Any failure by us to comply with the covenants and obligations under the credit facilities could result in an event of default, in which case the Bank may be entitled to declare all amounts owed to be due and payable immediately.

Under the credit facilities, interest on outstanding borrowings accrues at a rate per annum equal to the greater of (i) the prime rate plus 2.5% or (ii) 7.0%. In addition, if we achieve certain levels of liquidity, based on cash on hand and availability under the credit facility, we will have a 0.5% lower interest rate.

N2 Bio has two separate credit facilities with Middlesex Savings Bank (“MSB”): (i) a Secured Term Loan and (ii) a Secured Revolving Demand Note. Under the Secured Term Loan, N2 Bio borrowed \$6.0 million on September 18, 2013 to finance the purchase of the Bio Business Unit from the Company. The advance made under the Secured Term Loan will bear interest at a fixed rate of 4.5% per annum in eighty-four (84) consecutive monthly payments starting on October 18, 2013. If not sooner paid, the Secured Term Loan shall be due and payable in full on September 18, 2020. The Secured Revolving Demand Note provides an amount available of up to \$1.0 million. Advances made under the Secured Revolving Demand Note will bear interest at MSB's prime rate, as determined, plus 0.5% per annum but in no event shall the interest rate be less than 3.75% per annum. The maturity date of the Secured Revolving Demand Note is September 18, 2014.

N2 Bio's obligations under the credit facilities, are secured by substantially all of the assets of N2 Bio. Advances under the Secured Revolving Demand Note are limited to 75% of eligible receivables. In addition, until all amounts under the credit facilities with MSB are repaid, covenants under the credit facilities impose restrictions on the N2 Bio's ability to, among other things, incur additional indebtedness, create or permit liens on the N2 Bio's assets, merge, consolidate or dispose of assets (other than in the ordinary course of business), make dividend and other restricted payments, make certain debt or equity investments, make certain acquisitions, engage in certain transactions with affiliates or change the business conducted by the N2 Bio. Any failure by N2 Bio to comply with the covenants and obligations under the credit facilities could result in an event of default, in which case MSB may be entitled to declare all amounts owed to be due and payable immediately.

Advances outstanding under our Revolving Credit Facility were \$107 thousand and \$449 thousand at December 31, 2013 and 2012, respectively. Advances outstanding under our Ex-Im Facility were \$38 thousand and \$141 thousand at December 31, 2013 and 2012, respectively. Advances outstanding under the N2 Bio Secured Term Loan were \$5.8 million at December 31, 2013. Advances outstanding under the N2 Bio Secured Revolving Demand Note were \$438 thousand at December 31, 2013. As of December 31, 2013, the interest rate per annum on our Revolving Credit Facility and Ex-Im Facility was 6.0% and 6.0%, respectively. The interest rate per annum on the N2 Bio Secured Term Loan and Secured Revolving Demand Note on December 31, 2013 was 4.56% and 3.75%, respectively. We had

utilized \$675 thousand of the guidance line at December 31, 2012. Combined availability under the Revolving Credit Facility, the Ex-Im Facility and the Secured Revolving Demand Note was \$581 thousand as of December 31, 2013. We were in compliance with our covenants under the credit facilities at December 31, 2013.

Contractual Obligations, Commercial Commitments and Off-Balance Sheet Arrangements.

The following table summarizes our gross contractual obligations at December 31, 2013 and the maturity periods and the effect that such obligations are expected to have on its liquidity and cash flows in future periods:

Contractual Obligations (in thousands)	Payments Due by Period				
	Total	Less than 1 Year	2 - 3 Years	4 - 5 Years	More Than 5 Years
Revolving Credit Facility (SVB)	\$ 107	\$ 107	\$—	\$—	\$—
Ex-Im Facility (SVB)	38	38	—	—	—
Revolving Demand Note (MSB)	438	438	—	—	—
Term Note (MSB)	6,790	1,003	2,006	2,006	1,775
Purchase obligations	516	510	—	6	—
Unrelated party capital leases	8	8	—	—	—
Operating leases:					
Unrelated party operating leases	92	63	28	1	—
Related party operating leases	11,295	2,386	4,988	2,923	998
	\$ 19,284	\$ 4,553	\$ 7,022	\$ 4,936	\$ 2,773

Purchase obligations include all firm, non-cancelable and unconditional purchase agreements. Included in purchase obligations are raw material, equipment and services needed to fulfill customer orders.

The Revolving Credit Facility, Ex-Im Facility and Revolving Demand Note do not include an interest component to the contractual obligation.

Outstanding letters of credit totaled \$170 thousand and \$675 thousand at December 31, 2013 and 2012, respectively. The letters of credit secure performance obligations and purchase commitments, and allow holders to draw funds up to the face amount of the letter of credit if we do not perform as contractually required. The outstanding letters of credit at December 31, 2013 were secured by restricted cash and the outstanding letters of credit at December 31, 2012 were secured by the Revolving Credit Facility and Ex-Im Facility.

#### Recent Accounting Pronouncements

In July 2013, the Financial Accounting Standards Board ("FASB") issued Accounting Standard Update ("ASU") No. 2013-11 ("ASU 2013-11"), Presentation of an Unrecognized Tax Benefit When a Net Operating Loss Carryforward, a Similar Tax Loss, or a Tax Credit Carryforward Exists. The update requires, unless certain conditions exist, an unrecognized tax benefit, or a portion of an unrecognized tax benefit, to be presented in the financial statements as a reduction to a deferred tax asset for a net operating loss carryforward, similar tax loss, or a tax credit carryforward. ASU 2013-11 is effective prospectively for reporting periods beginning after December 15, 2013, with early adoption permitted. Retrospective application is permitted. We are currently evaluating the impact of ASU 2013-11 yet there are no uncertain tax positions included in the consolidated financial statements.

In December 2011, the FASB issued ASU No. 2011-11 ("ASU 2011-11"), Disclosures about Offsetting Assets and Liabilities. The update requires companies to disclose information about financial instruments that have been offset and related arrangements to enable users of their financial statements to understand the effect of those arrangements on their financial position. Companies will be required to provide both net (offset amounts) and gross information in the notes to the financial statements for relevant assets and liabilities that are offset. In January 2013, the FASB issued ASU No. 2013-01 ("ASU 2013-01"), Clarifying the Scope of Disclosures About Offsetting Assets and Liabilities. The update limits the scope of the offsetting disclosures required by ASU 2011-11. ASU 2011-11 and ASU 2013-01 are effective for interim and annual periods beginning after December 31, 2012. As the requirements of these ASUs relate only to disclosures, the application of the updates did not have an impact on our consolidated financial statements.

In December 2011, the FASB issued ASU No. 2011-12 ("ASU 2011-12"), Comprehensive Income: Deferral of the Effective Date for Amendments to the Presentation of Reclassifications of Items Out of Accumulated Other Comprehensive Income in Accounting Standards Update No. 2011-05. ASU 2011-12 deferred the effective date of the specific requirement to present items that are reclassified out of accumulated other comprehensive income to net income alongside their respective components of net income and other comprehensive income. As part of this update, the FASB did not defer the requirement to report comprehensive income in either a single continuous statement or in two separate but consecutive statements. In February 2013, the FASB issued ASU No. 2013-02 ("ASU 2013-02"), Comprehensive Income: Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income. ASU 2013-02 is effective for interim and annual periods beginning after December 31, 2012. As ASU

2013-02 relates to disclosure requirements only, the application of this update did not have a material impact on our consolidated financial statements.

#### Impact of Inflation and Changing Prices

Historically, our business has not been materially impacted by inflation. Manufacturing equipment and solar systems are generally quoted, manufactured and shipped within a cycle of approximately nine months, allowing for orderly pricing adjustments to the cost of labor and purchased parts. We have not experienced any negative effects from the impact of inflation on long-term contracts. Our service business is not expected to be seriously affected by inflation because its procurement-production cycle typically ranges from two weeks to several months, and prices generally are not fixed for more than one year. Research and development contracts usually include cost escalation provisions.

#### Foreign Currency Fluctuation

We sell almost exclusively in U.S. dollars, generally against an irrevocable non-transferable confirmed letter of credit through a major United States bank. Accordingly, we are not directly affected by foreign exchange fluctuations on our current sales orders. However, fluctuations in foreign exchange rates do have an effect on our customers' access to U.S. dollars and on the pricing competition on certain pieces of equipment that we sell in selected markets. We bear the risk of any currency fluctuations that may be associated with these commitments. We attempt to hedge known transactions when possible to minimize foreign exchange risk. We had no hedging activity in 2013 and 2012. Foreign exchange loss included in other expense, net was approximately \$9 thousand and \$7 thousand for the years ended December 31, 2013 and 2012, respectively.

#### Related Party Transactions

##### Leases with SPI-Trust

On November 30, 2007, we entered into a new Lease Agreement (the "Bedford Lease") with SPI-Trust, a Trust of which Roger G. Little, Chairman of the Board of the Company, is the sole trustee and principal beneficiary, with respect to 144,230 square feet of space comprising the entire building in which we have occupied space since December 1, 1985. The term of the Bedford Lease commenced on December 1, 2007 and was originally set to expire on November 30, 2012. The annual rental rate for the first year of the Bedford Lease was \$12.50 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increased on each anniversary by \$0.75 per square foot.

On September 17, 2010, we entered into the First Amendment to Lease Agreement with SPI-Trust to amend the Bedford Lease. The term of the Bedford Lease was extended for an additional five (5) years to expire on November 30, 2017. The annual rental rate for the first year of the extended term (December 1, 2012 through November 30, 2013) is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. After the first year of the extended term of the Bedford Lease, the annual rental rate increases on each anniversary by \$0.50 per square foot. We have the right to further extend the term of the Bedford Lease for an additional five (5) year period. If we exercise this right to further extend the term of the Bedford Lease, the annual rental rate for the first year of the further extended term will be the greater of: (a) the rental rate in effect immediately preceding the commencement of the extended term; or (b) the market rate at such time, and on each anniversary of the commencement of the extended term the rental rate will increase by \$0.50 per square foot. Additionally, SPI-Trust agreed to reimburse us up to \$50 thousand for all costs incurred by us in connection with any alterations or improvements to the premises or repairs or replacements to the heating and air conditioning systems.

On September 18, 2013, the we entered into the Second Amendment to Lease Agreement with SPI-Trust to amend the Bedford Lease. The leased portion of the premises and annual base rent in Bedford, Massachusetts was reduced by approximately 19%. All other material terms and conditions related to the lease remain unchanged as of such date. We believe that the terms of the Bedford Lease, as amended, are commercially reasonable. Rent expense from continuing operations under the Bedford Lease was \$2.2 million and \$2.3 million for the years ended December 31, 2013 and 2012, respectively.

On September 18, 2013, N2 Bio entered into a Lease Agreement (the "N2 Bio Bedford Lease") with SPI-Trust with respect to 27 thousand square feet of space in the premises in Bedford, Massachusetts. The term of the N2 Bio Bedford Lease commenced on September 18, 2013 and is set to expire on November 30, 2020. The annual rental rate prorated for September 18, 2013 to November 30, 2013 is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on December 1, 2013 and each anniversary thereafter by \$0.50 per square foot. We believe that the terms of the N2 Bio Bedford Lease are commercially reasonable. Rent expense under the N2 Bio Bedford Lease was \$137 thousand for year ended December 31, 2013.

On August 29, 2008, we entered into a new Lease Agreement (the “Hudson Lease”) with SPI-Trust, with respect to 90 thousand square feet of space comprising the entire building in which Spire Semiconductor occupied space since June 1, 2003. The term of the Hudson Lease commenced on September 1, 2008, and was to continue for seven (7) years until August 31, 2015. The annual rental rate for the first year of the Hudson Lease was \$12.50 per square foot on a triple-net basis, whereby the tenant was responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on each anniversary by \$0.75 per square foot. In addition, we were required to deposit with SPI-Trust \$300 thousand as security for performance by us for our covenants and obligations under the Hudson Lease. SPI-Trust is responsible, at its sole expense, to make certain defined tenant improvements to the building. We believe that the terms of the Hudson Lease was commercially reasonable and reflective of market rates. The Hudson Lease was classified as a related party operating lease. Rent expense from continuing operations under the Hudson Lease was zero and \$119 thousand for the years ended December 31, 2013 and 2012, respectively. Rent expense from discontinued operations under the Hudson Lease was zero and \$134 thousand for the years ended December 31, 2013 and 2012, respectively. In connection with sale of the Semiconductor Business Unit, the lease was terminated on March 9, 2012 and we were released from all future obligations under the lease as of such date. The security deposit of \$300 thousand was used to off-set rent payments in the first quarter of 2012. See Note 18 to the consolidated financial statements.

#### N2 Biomedical LLC

In September 2013, we sold substantially all of the assets relating to our biomedical business to N2 Bio. Mark C. Little, the Chief Executive Officer of N2 Bio, was the Chief Executive Officer of the Subsidiary and is a member of our Board of Directors. Mr. Little is the son of Roger G. Little, our Chairman of the Board. Roger G. Little is also a member of the Board of Directors of N2 Bio. See “Transactions” above for additional information about the N2 Bio transaction.

#### Critical Accounting Policies

The preparation of financial statements in accordance with accounting principles generally accepted in the United States requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Among the significant estimates affecting our consolidated financial statements are those relating to revenue recognition, reserves for doubtful accounts, reserve for excess and obsolete inventory, impairment of long-lived assets, share-based compensation and warranty reserves. We regularly evaluate our estimates and assumptions based upon historical experience and various other factors that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. To the extent actual results differ from those estimates, our future results of operations may be affected. We believe the following critical accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements. Refer to Note 2 of our notes to consolidated financial statements for a description of our significant accounting policies.

#### Revenue Recognition

We derive our revenues from continuing operations from three primary sources: (1) commercial products including, but not limited to, solar energy manufacturing equipment and solar energy systems; (2) biomedical processing services; and (3) United States government funded research and development contracts.

We generally recognize product revenue upon shipment of products provided there are no uncertainties regarding customer acceptance, persuasive evidence of an arrangement exists, the sales price is fixed or determinable, and collectability is reasonably assured. These criteria are generally met at the time of shipment when the risk of loss and title passes to the customer.

Our OEM (original equipment manufacturer) capital equipment solar energy business builds complex customized machines to order for specific customers. Most orders are sold on a FOB Bedford, Massachusetts (or EX-Works Factory) basis and other orders are sold on a Carriage and Insurance Paid (or CIP), or on rare situations, a Delivery Duty Unpaid (or DDU) basis. It is our policy to recognize revenues for this equipment when title of the product has passed to the customer, provided that customer acceptance is obtained prior to shipment and the equipment is expected to operate the same in the customer's environment as it does in our environment. When an arrangement with the customer includes future obligations or customer acceptance, revenue is recognized when those obligations are met or customer acceptance has been achieved. Typically, we are able to separate arrangements with multiple elements into more than one unit of accounting as it relates to the passage of title to goods, training and installation services when no right of return exists. We allocate total fees under contract to each element using the relative selling price method and revenue is recognized upon delivery of each element. Our management performs extensive analysis to determine the relative selling price of each unit of accounting. We allocate revenue in arrangements using our best estimate of selling price if neither vendor-specific objective evidence ("VSOE") nor third-party evidence ("TPE") of selling price exists. We



determine estimated selling price ("ESP") of each deliverable based on a number of factors, including internal costs, gross margin targets and historical sales of similar units, as well as external factors such as market and competitive conditions.

Our solar systems business provides photovoltaic systems for application to powering buildings with connection to the utility grid. It is our policy to recognize revenues for these systems as title passes, the customer accepts the system installation and interconnection to the grid is achieved.

Our biomedical business provides advanced medical device surface treatment processes for performance improvement of orthopedic devices. It is our policy to recognize revenues from these services when services are provided to the customer.

We recognize revenues and estimated profits on long-term government contracts on a percent complete basis where the circumstances are such that total profit can be estimated with reasonable accuracy and ultimate realization is reasonably assured. We record revenue and profit utilizing the percentage of completion method using a cost-to-cost methodology. A percentage of the contract revenues and estimated profits is determined utilizing the ratio of costs incurred to date to total estimated cost to complete on a contract by contract basis. Profit estimates are revised periodically based upon changes in facts, and any losses on contracts are recognized immediately. Some of the contracts include provisions to withhold a portion of the contract value as retainage until such time as the United States government performs an audit of the cost incurred under the contract. Our policy is to take into revenue the full value of the contract, including any retainage, as it performs against the contract since we have not experienced any substantial losses as a result of audits performed by the United States government.

#### Allowance for Doubtful Accounts

We maintain allowances for doubtful accounts for estimated losses resulting from the inability of our customers to pay amounts due. We actively pursue collection of past due receivables as the circumstances warrant. Customers are contacted to determine the status of payment and senior accounting and operations management are included in these efforts as is deemed necessary. A specific reserve will be established for past due accounts when it is probable that a loss has been incurred and we can reasonably estimate the amount of the loss. We do not record an allowance for government receivables and invoices backed by letters of credit as realizability is reasonably assured. Bad debts are written off against the allowance when identified. There is no dollar threshold for account balance write-offs. While rare, a write-off is only recorded when all efforts to collect the receivable have been exhausted.

#### Inventories and Reserve for Excess and Obsolescence

We perform a detailed assessment of inventory at each balance sheet date, which includes a review of, among other factors, an estimate of future demand for products within specific time horizons, valuation of existing inventory, as well as product lifecycle and product development plans. Inventory reserves are also provided to cover risks arising from slow-moving items. We write down our inventory for estimated obsolescence or unmarketable inventory equal to the difference between the cost of inventory and the estimated market value based on assumptions about future demand and market conditions. We may be required to record additional inventory write-downs if actual market conditions are less favorable than those projected by our management.

#### Impairment of Long-lived Assets

We account for long-lived assets in accordance with the provisions of Accounting Standard Codification ("ASC") No. 360-10-5-4 ("ASC 360-10-5-4"), Impairment or Disposal of Long-Lived Assets. ASC 360-10-5-4 requires that

long-lived assets and certain identifiable intangibles be reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. We measure recoverability of assets and /or asset groups to be held and used by a comparison of the carrying amount of an asset and/or asset group to future undiscounted net cash flows expected to be generated by the asset and/or asset groups. If such assets and/or asset groups are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets and/or asset groups exceed the fair value of the assets. We report assets to be disposed of at the lower of the carrying amount or fair value less costs to sell.

#### Share-Based Compensation

We account for our share-based compensation plans in accordance with the fair value recognition provisions of ASC 718 Compensation—Stock Compensation. We utilize the Black-Scholes option pricing model as our method for determining the fair value of stock option grants. ASC 718 requires the fair value of all share-based awards that are expected to vest to be recognized in the statements of operations over the service or vesting period of each award. We use the straight-line method of attributing the value of share-based compensation expense for all stock option grants over the requisite service period.

## Warranty

We provide warranties on certain products and services. Our warranty programs are described below:

We generally warrant solar manufacturing equipment sold for a total of 360 days, which include the replacement of defective component parts and the labor to correct the defect. On occasion, extended warranties will be given to certain customers of solar manufacturing equipment for up to an additional 360 days.

Spire Biomedical and N2 Bio warrants that its services only will meet the agreed upon specifications.

We provide for the estimated cost of product warranties, determined primarily from historical information, at the time product revenue is recognized. Should actual product failure warranties differ from our estimates, revisions to the estimated warranty liability would be required.

## Variable Interest Entity

We have an interest in an entity that is a Variable Interest Entity ("VIE"). If we are the primary beneficiary of a VIE, we are required to consolidate it. To determine if we are the primary beneficiary, we evaluate whether we have the power to direct the activities that most significantly impact the VIE's economic performance and the obligation to absorb losses or the right to receive benefits of the VIE that could potentially be significant to the VIE. Our evaluation includes identification of significant activities and an assessment of our ability to direct those activities based on governance provisions and arrangements to provide or receive product and process technology, product supply, operations services, equity funding, financing and other applicable agreements and circumstances. Our assessments of whether we are the primary beneficiary of our VIE require significant assumptions and judgments.

## Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Not required as we are a smaller reporting company.

Item 8. Financial Statements

Consolidated Financial Statements

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders  
of Spire Corporation:

We have audited the accompanying consolidated balance sheets of Spire Corporation and Subsidiaries (the "Company") as of December 31, 2013 and 2012 and the related consolidated statements of operations, comprehensive loss, stockholders' equity (deficit) and cash flows for the years then ended. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, 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. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Spire Corporation and Subsidiaries as of December 31, 2013 and 2012, and the results of their operations and their cash flows for the years then ended, in conformity with U.S. generally accepted accounting principles.

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, during the year ended December 31, 2013, the Company incurred an operating loss from continuing operations of \$8.4 million and cash used in operating activities of continuing operations was \$5.2 million. The Company's credit agreement with a bank is due to expire on April 30, 2014. These factors raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1 to the financial statements. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

McGladrey LLP

Boston, Massachusetts  
March 31, 2014

SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED BALANCE SHEETS  
(in thousands, except share and per share amounts)

	December 31, 2013	December 31, 2012
Assets		
Current assets		
Cash and cash equivalents	\$ 3,986	\$ 3,030
Restricted cash	170	—
Available-for-sale investments, at quoted market value (cost of \$3,142 at December 31, 2013)	3,535	—
Accounts receivable – trade, net	1,414	2,137
Inventories, net	3,816	5,316
Deferred cost of goods sold	849	185
Deposits on equipment for inventory	—	69
Prepaid expenses and other current assets	926	617
Current assets of discontinued operations	—	718
Total current assets	14,696	12,072
Property and equipment, net	941	1,197
Intangible and other assets, net	432	393
Available-for-sale investments, at quoted market value (cost of \$2,741 at December 31, 2012)	—	2,963
Total assets	\$ 16,069	\$ 16,625
Liabilities and Stockholders' Equity (Deficit)		
Current liabilities		
Current portion of capital lease obligation	\$ 8	\$ 13
Revolving line of credits	583	590
Current portion of term loan	753	—
Accounts payable	2,323	1,424
Accrued liabilities	2,336	2,221
Advances on contracts in progress	1,433	1,037
Deferred compensation, current portion	3,535	—
Liabilities of discontinued operations	21	171
Total current liabilities	10,992	5,456
Long-term portion of capital lease obligation	—	8
Long-term portion of term loan	5,064	—
Deferred compensation	—	2,963
Other long-term liabilities	726	746
Total long-term liabilities	5,790	3,717
Total liabilities	16,782	9,173
Stockholders' equity (deficit)		
Common stock, \$0.01 par value; 20,000,000 shares authorized; 9,207,874 and 9,062,633 shares issued and outstanding on December 31, 2013 and December 31, 2012, respectively	93	91
Additional paid-in capital	23,267	23,084
Accumulated deficit	(24,422)	(15,945)
Accumulated other comprehensive income	393	222

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Total Spire Corporation stockholders' equity (deficit)	(669	)	7,452
Noncontrolling interest	(44	)	—
Total stockholders' equity (deficit)	(713	)	7,452
Total liabilities and stockholders' equity (deficit)	\$ 16,069		\$ 16,625

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

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SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED STATEMENTS OF OPERATIONS  
(in thousands, except share and per share amounts)

	Years Ended December 31,	
	2013	2012
Net sales and revenues		
Sales of goods	\$5,734	\$12,989
Contract research and service revenues	8,847	9,121
Total net sales and revenues	14,581	22,110
Cost of sales and revenues		
Cost of goods sold	7,514	11,943
Cost of contract research and services	4,561	4,896
Total cost of sales and revenues	12,075	16,839
Gross margin	2,506	5,271
Operating expenses		
Selling, general and administrative expenses	10,851	11,676
Internal research and development expenses	31	233
Total operating expenses	10,882	11,909
Gain on termination of contracts	—	35
Operating loss from continuing operations	(8,376 )	(6,603 )
Interest expense, net	(138 )	(120 )
Foreign exchange loss	(9 )	(7 )
Total other expense, net	(147 )	(127 )
Loss from continuing operations before income tax benefit	(8,523 )	(6,730 )
Income tax benefit - continuing operations	2	1,951
Loss from continuing operations	(8,521 )	(4,779 )
Loss from discontinued operations before sale of business unit	—	(580 )
Gain on sale of business unit, net of transaction expenses	—	5,449
Income tax provision - discontinued operations	—	(1,948 )
Income from discontinued operations, net of tax	—	2,921
Net loss	(8,521 )	(1,858 )
Less: Net loss attributable to noncontrolling interest	(44 )	—
Net loss attributable to common stockholders	\$(8,477 )	\$(1,858 )
Basic and diluted income (loss) per share:		
From continuing operations, net of tax	(0.92 )	(0.56 )
From discontinued operations, net of tax	—	0.34
Basic and diluted loss per share	(0.92 )	(0.22 )
Weighted average number of common and common equivalent	9,176,438	8,579,027



shares outstanding – basic and diluted

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

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SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS  
(in thousands)

	Years Ended December 31,	
	2013	2012
Comprehensive loss:		
Net loss	\$ (8,521 )	\$ (1,858 )
Other comprehensive income:		
Change in unrealized gain on available for sale marketable securities, net of tax	171	21
Total comprehensive loss	(8,350 )	(1,837 )
Less: Comprehensive loss attributable to noncontrolling interests	(44 )	—
Comprehensive loss attributable to common stockholders	\$ (8,306 )	\$ (1,837 )

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

SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (DEFICIT)  
(in thousands, except share amounts)

	Common Stock	Additional Paid-in	Accumulated	Accumulated Other Comprehensive	Spire Corp. Stockholders'	Noncontrolling	Total Stockholders'	
	Shares	Amount	Capital	Deficit	Income	Total	Interest	Equity (Deficit)
Balance, December 31, 2011	8,562,633	\$ 86	\$ 22,510	\$ (14,087 )	\$ 201	\$ 8,710	—	8,710
Issuance of common stock to the deferred compensation plan	500,000	5	379	—	—	384	—	384
Share-based compensation <sup>(1)</sup>	—	—	195	—	—	195	—	195
Net change in unrealized gain on available for sale marketable securities	—	—	—	—	21	21	—	21
Net loss	—	—	—	(1,858 )	—	(1,858 )	—	(1,858 )
Balance, December 31, 2012	9,062,633	\$ 91	\$ 23,084	\$ (15,945 )	\$ 222	\$ 7,452	\$ —	\$ 7,452
Issuance of common stock to the deferred compensation plan	145,241	2	83	—	—	85	—	85
Share-based compensation	—	—	100	—	—	100	—	100
Net change in unrealized gain on available for sale marketable securities	—	—	—	—	171	171	—	171
Net loss attributable to common stockholders	—	—	—	(8,477 )	—	(8,477 )	—	(8,477 )
Net loss attributable to noncontrolling interests	—	—	—	—	—	—	(44 )	(44 )
Balance, December 31, 2013	9,207,874	\$ 93	\$ 23,267	\$ (24,422 )	\$ 393	\$ (669 )	\$ (44 )	\$ (713 )

<sup>(1)</sup> Includes \$(7) thousand, related to discontinued operations for the years ended December 31, 2012.

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



SPIRE CORPORATION AND SUBSIDIARIES  
CONSOLIDATED STATEMENTS OF CASH FLOWS  
(in thousands)

	For Years Ended December 31,	
	2013	2012
Cash flows from operating activities:		
Net loss	\$(8,521)	\$(1,858 )
Less: Net income from discontinued operations, net of tax	—	2,921
Net loss from continuing operations	(8,521	) (4,779 )
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	509	804
Deferred tax benefit	—	(1,948 )
Deferred compensation	171	21
Share-based compensation	100	202
Provision for accounts receivable reserve	18	30
Provision for inventory reserve	221	317
Changes in assets and liabilities:		
Restricted cash	(170	) 21
Accounts receivable	705	1,297
Inventories	1,245	1,115
Deferred cost of goods sold	(664	) (5 )
Deposits, prepaid expenses and other current assets	(240	) 680
Accounts payable, accrued liabilities and other liabilities	1,079	(2,972 )
Deposit – related party	—	300
Advances on contracts in progress	396	(1,195 )
Net cash used in operating activities of continuing operations	(5,151	) (6,112 )
Net cash used in operating activities of discontinued operations	(150	) (1,726 )
Net cash used in operating activities	(5,301	) (7,838 )
Cash flows from investing activities:		
Purchase of property and equipment	(139	) (143 )
Additions to intangible and other assets	(119	) (2 )
Net cash used in investing activities of continuing operations	(258	) (145 )
Net cash provided by investing activities of discontinued operations	718	6,859
Net cash provided by investing activities	460	6,714
Cash flows from financing activities:		
Principal payments on capital lease obligations	(13	) (37 )
Principal borrowings on term loan	6,000	—
Principal payments on term loan	(183	) —
Principal payments on revolving line of credit, net	(7	) (567 )
Net cash provided by (used in) financing activities	5,797	(604 )
Net increase (decrease) in cash and cash equivalents	956	(1,728 )
Cash and cash equivalents, beginning of year	3,030	4,758
Cash and cash equivalents, end of year	\$3,986	\$3,030
Supplemental disclosures of cash flow information:		
Interest paid	\$138	\$120
Income taxes refunded, net	\$(7	) \$(5 )
Supplemental disclosures of non-cash flow information:		
Liabilities settled with common stock	\$84	\$384
Deemed dividend	\$9,540	\$—

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

SPIRE CORPORATION AND SUBSIDIARIES  
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

December 31, 2013 and 2012

1. Description of the Business

Spire Corporation ("Spire" or the "Company") and its subsidiaries, along with its variable interest entity, develop, manufacture and market highly-engineered products and services in two principal business areas: (i) capital equipment and systems for the photovoltaic solar industry and (ii) biomedical, through its variable interest entity, N2 Biomedical LLC ("N2 Bio"), generally bringing to bear expertise in materials technologies, surface science and thin films across both business areas, discussed below.

In the photovoltaic solar area, the Company develops, manufactures and markets specialized equipment for the production of terrestrial photovoltaic modules from solar cells and provide photovoltaic systems for grid connected applications in the commercial markets. The Company's equipment has been installed in approximately 200 factories in 50 countries. The equipment market is very competitive with major competitors located in the U.S., Japan and Europe. The Company's flagship product is its Spi-Sun simulator which tests module performance. The Company's other product offerings include turn-key module lines and to a lesser extent other individual equipment. To compete the Company offers other services such as training and assistance with module certification. The Company also provides turn-key services to its customers to backward integrate to solar cell manufacturing.

In the biomedical area, through its variable interest entity, N2 Bio, the Company provides value-added surface treatments to manufacturers of orthopedic and other medical devices that enhance the durability, antimicrobial characteristics or other material characteristics of their products, and performs sponsored research programs into practical applications of advanced biomedical technologies.

Transactions

On September 18, 2013, the Company, Spire Biomedical, Inc. (the "Subsidiary" and together with the Company, "Spire Bio") entered into an Asset Purchase Agreement (the "Purchase Agreement") with N2 Bio pursuant to which N2 Bio agreed to (i) acquire substantially all of the assets of the Subsidiary's biomedical business (the "Bio Business Unit") and (ii) assume and pay certain liabilities related to the purchased assets as set forth in the Purchase Agreement (collectively, the "Transaction"). The Transaction closed on September 18, 2013. The purchase price for the Bio Business Unit was \$10.5 million plus the assumption of liabilities of approximately \$100 thousand, with \$6.0 million paid in cash at closing, a \$2.4 million subordinated convertible promissory note, and 310,549 Series A Convertible Preferred Units of N2 Bio valued at approximately \$2.1 million (\$6.72 per share). The assets and liabilities of the Subsidiary's biomedical business are under common control and were recorded at carryover basis for financial reporting. The difference between the consideration paid and the carrying value of the assets and liabilities acquired by N2 Bio was recorded as a deemed dividend to the Company in the amount of \$9.5 million and has been eliminated in consolidation. Mark C. Little was the Chief Executive Officer of the Subsidiary, is a member of the Company's Board of Directors and is the Chief Executive Officer of N2 Bio. Mark C. Little is the son of Roger G. Little, Chairman of the Board of the Company. Roger G. Little is also a member of the Board of Directors of N2 Bio.

The Company has determined that N2 Bio is a variable interest entity ("VIE") because the equity investment at risk from the majority shareholders of N2 Bio is not sufficient to permit N2 Bio to finance its activities without additional subordinated financial support. As discussed above, N2 Bio is subject to a subordinated convertible promissory note

to the Company. Additionally, Mark Little is the Chief Executive Officer of N2 Bio and also a member of the Company's Board of Directors. The Company has also determined that the Company has the obligation to absorb losses and the right to receive benefits from N2 Bio that could potentially be significant to it. Therefore, the Company has determined that N2 Bio is a VIE and that the Company is a primary beneficiary of the VIE and must consolidate the financial condition, results of operations and cash flows of N2 Bio with those of its own. See Note 19 to the consolidated financial statements.

The subordinated convertible promissory note (i) bears interest at 9% per annum until paid in full, (ii) is convertible, at Company's option, into Common Units of N2 Bio at a conversion price of \$6.72 per share, (iii) has a seven year term, (iv) is unsecured and (v) is subordinate in right of payment to all senior bank indebtedness of N2 Bio.

The Series A Convertible Preferred Units (i) represent an equity ownership interest of 19.9% in N2 Bio, (ii) are governed by the terms of the Amended and Restated Limited Liability Company Agreement of N2 Bio dated September 18, 2013, (iii) rank senior to the Common Units on liquidation, dissolution and winding up, and (iv) vote together with the Common Units on an as-



converted basis. The Company has the right to appoint one director to the Board of Directors of N2 Bio. N2 Bio is subject to certain affirmative and negative operating covenants in favor of the holder of Series A Preferred Units.

On September 18, 2013, the Company and N2 Bio entered into a Shared Services Agreement whereby the Company will provide N2 Bio certain services (the "Shared Services") for a period of three years. It is the intent of the parties that the aggregate fees for the Shared Services shall equal approximately \$500 thousand during the first year. Following the first anniversary, N2 Bio may terminate any specific Shared Service with 20 days' written notice to the Company.

On September 18, 2013, the lease agreement between SPI-Trust and the Company for the premises in Bedford, Massachusetts where the Business is located was amended, by reducing the Company's leased space and annual base rent by approximately 19%. All other material terms and conditions related to the lease remain unchanged as of such date.

On September 18, 2013, N2 Bio entered into a Lease Agreement (the "N2 Bio Bedford Lease") with SPI-Trust with respect to 27 thousand square feet of space in the premises in Bedford, Massachusetts. The term of the N2 Bio Bedford Lease commenced on September 18, 2013 and is set to expire on November 30, 2020. The annual rental rate prorated for September 18, 2013 to November 30, 2013 is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on December 1, 2013 and each anniversary thereafter by \$0.50 per square foot.

The Purchase Agreement includes a five-year commitment of (i) the Company not to compete with the Bio Business Unit services and (ii) N2 Bio not to compete with the consumer electronic products business of the Company. Both the Company and N2 Bio agreed not to solicit the officers or employees of the other party for a one-year period.

On March 9, 2012, the Company completed the sale of its semiconductor business unit, which provided semiconductor foundry services, operated a semiconductor foundry and fabrication facility and was engaged in the business of wafer epitaxy, foundry services, and device fabrication for the defense, medical, telecommunications and consumer products markets (the "Semiconductor Business Unit"), to Masimo Corporation ("Masimo"). Accordingly, the results of operations and assets and liabilities of the Semiconductor Business Unit are being presented herein as discontinued operations. See Note 18 to the consolidated financial statements.

## Liquidity

Operating results will depend upon revenue growth or decline and product mix, as well as the timing of shipments of higher priced products from the Company's solar equipment line. Export sales, which amounted to 34% and 53% of net sales and revenues for 2013 and 2012, respectively, continue to constitute a significant portion of the Company's net sales and revenues.

The Company has incurred operating losses from continuing operations. Operating loss from continuing operations was \$8.4 million and \$6.6 million in 2013 and 2012, respectively. Net cash used in operating activities was \$5.3 million in 2013, which includes \$150 thousand of cash used in operating activities of discontinued operations. Net cash used in operating activities was \$7.8 million in 2012, which includes \$1.7 million of cash used in operating activities of discontinued operations. As of December 31, 2013, the Company had unrestricted cash and cash equivalents of \$4.0 million compared to \$3.0 million as of December 31, 2012. The maturity date of the Company's credit facilities with Silicon Valley Bank is April 30, 2014. The maturity date of N2 Bio's revolving credit facility with Middlesex Savings Bank is September 18, 2014. These factors raise substantial doubt about the Company's ability to continue as a going concern. The Company currently believes that its existing cash resources at December 31, 2013,

will be sufficient to fund its operations into the second half of 2014; however, the Company cannot assure you of this.

The Company has various options on how to fund future operational losses and working capital needs, including but not limited to sales of equity, bank debt, the sale or license of assets and technology, or joint ventures involving cash infusions, as it has done in the past; however, there are no assurances that the Company will be able to sell equity, obtain or access bank debt, sell or license assets or technology or enter into such joint ventures on a timely basis and at appropriate values. The Company has developed several plans including potential strategic alternatives, cost reduction efforts and expanding revenue in other solar markets to offset a decline in business due to global economic conditions. The Company's inability to successfully implement its cost reduction strategies, expand revenue in other solar markets or to renew its credit facilities, could adversely impact the Company's ability to continue as a going concern.

Based on the forecasts and estimates underlying the Company's current operating plan, the financial statements do not include any adjustments that might be necessary if the Company is unable to continue as a going concern.

## 2. Summary of Significant Accounting Policies

### (a) Principles of Consolidation

The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries along with its variable interest entity. All significant intercompany balances and transactions have been eliminated in consolidation. The portion of the net loss attributable to the noncontrolling interest of N2 Bio is presented as net loss attributable to noncontrolling interest in the consolidated statements of operations and the portion of comprehensive loss attributable to the noncontrolling interest of N2 Bio is presented as comprehensive loss attributable to noncontrolling interests in the consolidated statements of comprehensive loss. The portion of stockholders' equity of N2 Bio attributable to the noncontrolling interest of N2 Bio is presented as noncontrolling interest in the consolidated balance sheets.

### (b) Revenue Recognition

The Company derives its revenues from continuing operations from three primary sources: (1) commercial products including, but not limited to, solar energy manufacturing equipment and solar energy systems; (2) biomedical processing services; and (3) United States government funded research and development contracts.

The Company generally recognizes product revenue upon shipment of products provided there are no uncertainties regarding customer acceptance, persuasive evidence of an arrangement exists, the sales price is fixed or determinable, and collectability is reasonably assured. These criteria are generally met at the time of shipment when the risk of loss and title passes to the customer.

The Company's OEM (original equipment manufacturer) capital equipment solar energy business builds complex customized machines to order for specific customers. Most orders are sold on a FOB Bedford, Massachusetts (or EX-Works Factory) basis and other orders are sold on a Carriage and Insurance Paid (or CIP), or on rare situations, a Delivery Duty Unpaid (or DDU) basis. It is the Company's policy to recognize revenues for this equipment when title of the product has passed to the customer, provided that customer acceptance is obtained prior to shipment and the equipment is expected to operate the same in the customer's environment as it does in the Company's environment. When an arrangement with the customer includes future obligations or customer acceptance, revenue is recognized when those obligations are met or customer acceptance has been achieved. Typically, the Company is able to separate arrangements with multiple elements into more than one unit of accounting as it relates to the passage of title to goods, training and installation services when no right of return exists. The Company allocates total fees under contract to each element using the relative selling price method and revenue is recognized upon delivery of each element. The Company's management performs extensive analysis to determine the relative selling price of each unit of accounting. The Company allocates revenue in arrangements using its best estimate of selling price if neither vendor-specific objective evidence ("VSOE") nor third-party evidence ("TPE") of selling price exists. The Company determines estimated selling price ("ESP") of each deliverable based on a number of factors, including internal costs, gross margin targets and historical sales of similar units, as well as external factors such as market and competitive conditions.

The Company's solar systems business provides photovoltaic systems for application to powering buildings with connection to the utility grid. It is the Company's policy to recognize revenues for these systems when title passes, the customer accepts the system installation and interconnection to the grid is achieved.

The Company's biomedical business provides advanced medical device surface treatment processes for performance improvement of orthopedic devices. It is the Company's policy to recognize revenues from these services when services are provided to the customer.

The Company recognizes revenues and estimated profits on long-term government contracts on a percent complete basis where the circumstances are such that total profit can be estimated with reasonable accuracy and ultimate realization is reasonably assured. The Company records revenue and profit utilizing the percentage of completion method using a cost-to-cost methodology. A percentage of the contract revenues and estimated profits is determined utilizing the ratio of costs incurred to date to total estimated cost to complete on a contract by contract basis. Profit estimates are revised periodically based upon changes in facts, and any losses on contracts are recognized immediately. Some of the contracts include provisions to withhold a portion of the contract value as retainage until such time as the United States government performs an audit of the cost incurred under the contract. The Company's policy is to take into revenue the full value of the contract, including any retainage, as it performs against the contract since the Company has not experienced any substantial losses as a result of audits performed by the United States government.

(c)Cash and Cash Equivalents

Cash and cash equivalents include cash, time deposits and all highly liquid debt instruments with original maturities of three months or less. These investments are carried at cost, which approximates market value. Cash and cash equivalents are deposited at various area banks, and at times may exceed federally insured limits.

(d) Restricted Cash

Restricted cash consist of certificates of deposit with various maturity dates. As of December 31, 2013, the Company had restricted cash in the amount of \$170 thousand to secure the Company's obligations under letters of credit.

(e) Available-for-Sale Investments

Available-for-sale investments consist of assets held as part of the Spire Corporation Non-Qualified Deferred Compensation Plan. These investments have been classified as available-for-sale investments and are reported at fair value, with unrealized gains and losses included in accumulated other comprehensive income. The unrealized gain on these marketable securities was \$393 thousand and \$222 thousand as of December 31, 2013 and 2012, respectively. Additionally, the Company settled \$84 thousand and \$384 thousand of accrued liabilities through issuance of common stock to the Spire Corporation Non-Qualified Deferred Compensation Plan during the twelve month period ended December 31, 2013 and 2012. The available-for-sale investments balance at December 31, 2013 is classified in total current assets. See Note 13 to the consolidated financial statements.

(f) Inventories

Inventories are stated at the lower of cost or market, cost being determined on a first-in, first-out ("FIFO") basis. Judgments and estimates are used in determining the likelihood that goods on hand can be sold to customers. Historical inventory usage, forecasted demand and current revenue trends are considered in estimating both excess and obsolete inventory. If actual product demand and market conditions are less favorable than those projected by management, additional inventory write-downs may be required.

(g) Property and Equipment

Property and equipment is stated at cost. Depreciation and amortization are provided using the straight-line method over the estimated useful lives of the respective assets, as follows:

Equipment under capital lease	Lesser of 5 years or remaining life of lease
Machinery and equipment	5 and 7 years
Furniture and fixtures and computer equipment	3 - 5 years
Leasehold improvements	Lesser of 10 years or remaining life of lease

Maintenance and repairs are charged to expense as incurred. Major renewals and betterments are added to property and equipment accounts at cost.

(h) Intangible and Other Assets

Patents amounted to \$62 thousand and \$111 thousand, net of accumulated amortization of \$871 thousand and \$822 thousand, at December 31, 2013 and 2012, respectively. Licenses amounted to \$110 thousand and \$60 thousand, net of accumulated amortization of \$38 thousand and \$15 thousand, at December 31, 2013 and 2012, respectively. Patent cost is primarily composed of cost associated with securing and registering patents that the Company has been

awarded or that have been submitted to, and the Company believes will be approved by the government. License cost is composed of the cost to acquire rights to the underlying technology or know-how. These costs are capitalized and amortized over their useful lives or terms, using the straight-line method. There are no expected residual values related to these patents. Amortization expense from continuing operations, relating to patents and licenses, was approximately \$80 thousand for the year ended December 31, 2013 which includes \$8 thousand of patents pending that were abandoned and written-off during the year. Amortization expense from continuing operations, relating to patents and licenses, was approximately \$99 thousand for the year ended December 31, 2012 which includes \$38 thousand of patents pending that were abandoned and written-off during the year.

The table below includes future amortization expense for patents and licenses owned by the Company as well as estimated amortization expense related to patents that remain pending at December 31, 2013 of \$110 thousand. This estimated expense for

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patents pending assumes that the patents are issued immediately, and therefore are being amortized over five years on a straight-line basis. Estimated amortization expense for the periods ending December 31, is as follows:

(in thousands)	Amortization Expense
2014	\$123
2015	45
2016	31
2017	28
2018	27
2019 and future	28
	\$282

Included in other assets are refundable deposits made by the Company of approximately \$150 thousand and \$154 thousand at December 31, 2013 and 2012, respectively. Also included in other assets is a receivable related to an insurance settlement of approximately \$225 thousand at December 31, 2013.

#### (i) Long-lived Assets

The Company accounts for long-lived assets in accordance with the provisions of Accounting Standard Codification 360-10-5-4, Impairment or Disposal of Long-Lived Assets. ASC 360-10-5-4 requires that long-lived assets and certain identifiable intangibles be reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. The Company measures recoverability of assets and /or asset groups to be held and used by a comparison of the carrying amount of an asset and/or asset group to future undiscounted net cash flows expected to be generated by the asset and/or asset groups. If such assets and/or asset groups are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets and/or asset groups exceed the fair value of the assets. The Company reports assets to be disposed of at the lower of the carrying amount or fair value less costs to sell. The Company evaluated long-lived assets for impairment during the year ended December 31, 2013 and determined that the estimated future net undiscounted cash flows of the assets and/or asset groups exceeded the carrying amount of the assets.

#### (j) Income Taxes

In accordance with ASC 740, Accounting for Income Taxes, the Company recognizes deferred income taxes based on the expected future tax consequences of differences between the financial statement basis and the tax basis of assets and liabilities, calculated using enacted tax rates in effect for the year in which the differences are expected to be reflected in the tax return. Valuation allowances are provided if, based on the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company accounts for uncertain tax positions using a “more-likely-than-not” threshold for recognizing and resolving uncertain tax positions. The evaluation of uncertain tax positions is based on factors including, but not limited to, changes in tax law, the measurement of tax positions taken or expected to be taken in tax returns, the effective settlement of matters subject to audit, new audit activity and changes in facts or circumstances related to a tax position. The Company evaluates this tax position on a quarterly basis using a two-step process. The first step is a determination of whether the tax position should be recognized in the financial statements and the second step is the measurement of the tax position. The Company also accrues for potential interest and penalties as a component of income tax expense, related to unrecognized tax benefits. The Company’s evaluation was performed for the tax years ended December 31, 2010, 2011, 2012 and 2013, the tax years which remain subject to audit by the Internal Revenue Service and state tax jurisdictions.

(k) Warranty

The Company provides warranties on certain of its products and services. The Company's warranty programs are described below:

Spire Solar generally warrants solar manufacturing equipment sold for a total of 360 days, which include the replacement of defective component parts and the labor to correct the defect. On occasion, extended warranties will be given to certain customers of solar manufacturing equipment for up to an additional 360 days.

Spire Biomedical warrants that its services will meet the agreed upon specifications.

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The Company provides for the estimated cost of product warranties, determined primarily from historical information, at the time product revenue is recognized. Should actual product failure warranties differ from the Company's estimates, revisions to the estimated warranty liability would be required. Product warranty liabilities are included in accrued liabilities in the Company's consolidated balance sheets for the years ended December 31, 2013 and 2012. The changes in the product warranties for the years ended December 31, 2013 and 2012, are as follows:

(in thousands)

Balance at December 31, 2011	\$ 813	
Reduction to reserve	(63	)
Usage	(278	)
Balance at December 31, 2012	472	
Reduction to reserve	(242	)
Usage	(78	)
Balance at December 31, 2013	\$ 152	

#### (l) Internal Research and Development Costs

Internal research and development costs are charged to operations as incurred. During the years ended December 31, 2013 and 2012, Company funded research and development costs were approximately \$31 thousand and \$233 thousand, respectively.

#### (m) Loss Per Share

Basic loss per share is computed by dividing loss available to common stockholders by the weighted-average number of common shares outstanding during the period. Diluted loss per share gives effect to all potential dilutive common shares outstanding during the period. The computation of diluted loss per share does not assume conversion, exercise or contingent exercise of securities that would have an anti-dilutive effect on loss per share. The Company did not pay any dividends in 2013 and 2012.

#### (n) Comprehensive Loss

Comprehensive loss is comprised of net loss and other comprehensive loss. Besides the reported net loss, other comprehensive loss includes certain changes in equity that are excluded from net loss. Other comprehensive income (loss) was comprised of the change in the unrealized gain of available-for-sale investments of approximately \$171 thousand and \$21 thousand during the years ended December 31, 2013 and 2012, respectively.

#### (o) Share-Based Compensation

The Company accounts for its share-based compensation plans in accordance with the fair value recognition provisions of ASC 718 Compensation—Stock Compensation. The Company utilizes the Black-Scholes option pricing model as its method for determining the fair value of stock option grants. ASC 718 requires the fair value of all share-based awards that are expected to vest to be recognized in the statements of operations over the service or vesting period of each award. The Company uses the straight-line method of attributing the value of share-based compensation expense for all stock option grants over the requisite service period.

#### (p) Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. The significant estimates included in the consolidated financial statements are those relating to revenue recognition, reserves for doubtful accounts, the assessment of excess and obsolete inventory, impairment of long-lived assets, stock-based compensation, income taxes and warranty reserves. Actual results could differ from those estimates.

(q) Fair Value of Financial Instruments

Financial instruments of the Company include cash and cash equivalents, accounts receivable, accounts payable, revolving line of credit, term loan and capital leases. The Company's financial instruments at December 31, 2013 also include available-for-sale investments measured at fair value. See Note 8 to the consolidated financial statements.

(r) Shipping and Handling Costs

Shipping and handling costs are included in cost of goods sold.

(s) Foreign Currency

The Company sells almost exclusively in U.S. dollars, generally against an irrevocable confirmed letter of credit through a major United States bank. Accordingly, the Company is not directly affected by foreign exchange fluctuations on its current sales orders. However, fluctuations in foreign exchange rates have an effect on the Company's customers' access to U.S. dollars and on the pricing competition on certain pieces of equipment that the Company sells in selected markets. The Company bears the risk of any currency fluctuations that may be associated with these commitments. The Company attempts to hedge known transactions when possible to minimize foreign exchange risk. The Company had no hedging activity in 2013 and 2012. Foreign exchange loss included in other expense, net was approximately \$9 thousand and \$7 thousand for the years ended December 31, 2013 and 2012, respectively.

(t) Segment Information

ASC 280, Segment Reporting, requires public entities to report certain information about operating segments. Based on the guidance provided in ASC 280, the Company has determined that its business is conducted in three reportable segments: solar, biomedical and corporate.

(u) Variable Interest Entity

The Company has an interest in an entity that is a Variable Interest Entity ("VIE"). If the Company is the primary beneficiary of a VIE, the Company is required to consolidate it. To determine if the Company is the primary beneficiary, the Company evaluates whether it has the power to direct the activities that most significantly impact the VIE's economic performance and the obligation to absorb losses or the right to receive benefits of the VIE that could potentially be significant to the VIE. The Company's evaluation includes identification of significant activities and an assessment of the Company's ability to direct those activities based on governance provisions and arrangements to provide or receive product and process technology, product supply, operations services, equity funding, financing and other applicable agreements and circumstances. The Company's assessments of whether it is the primary beneficiary of its VIE require significant assumptions and judgments.

(v) Subsequent Events

The Company evaluates all events or transactions through the date of the related filing, in accordance with the provisions of ASC 855, Subsequent Events. Through the date of this filing, the Company did not have any material subsequent events that impacted its consolidated financial statements or disclosures.

(w) New Accounting Standards

In July 2013, the Financial Accounting Standards Board ("FASB") issued Accounting Standard Update ("ASU") No. 2013-11 ("ASU 2013-11"), Presentation of an Unrecognized Tax Benefit When a Net Operating Loss Carryforward, a Similar Tax Loss, or a Tax Credit Carryforward Exists. The update requires, unless certain conditions exist, an unrecognized tax benefit, or a portion of an unrecognized tax benefit, to be presented in the financial statements as a

reduction to a deferred tax asset for a net operating loss carryforward, similar tax loss, or a tax credit carryforward. ASU 2013-11 is effective prospectively for reporting periods beginning after December 15, 2013, with early adoption permitted. Retrospective application is permitted. The Company is currently evaluating the impact of ASU 2013-11 yet there are no uncertain tax positions included in the consolidated financial statements.

In December 2011, the FASB issued ASU No. 2011-11 ("ASU 2011-11"), Disclosures about Offsetting Assets and Liabilities. The update requires companies to disclose information about financial instruments that have been offset and related arrangements to enable users of their financial statements to understand the effect of those arrangements on their financial position. Companies will be required to provide both net (offset amounts) and gross information in the notes to the financial statements for relevant assets and liabilities that are offset. In January 2013, the FASB issued ASU No. 2013-01 (ASU 2013-01"), Clarifying the Scope of Disclosures About Offsetting Assets and Liabilities. The update limits the scope of the offsetting disclosures required by ASU 2011-11. ASU 2011-11 and ASU 2013-01 is effective for interim and annual periods beginning after December 31, 2012. As the requirements of these ASUs relate only to disclosures, the application of the updates did not have an impact on the Company's consolidated financial statements.

In December 2011, the FASB issued ASU No. 2011-12 ("ASU 2011-12"), Comprehensive Income: Deferral of the Effective Date for Amendments to the Presentation of Reclassifications of Items Out of Accumulated Other Comprehensive Income in Accounting Standards Update No. 2011-05. ASU 2011-12 deferred the effective date of the specific requirement to present items that are reclassified out of accumulated other comprehensive income to net income alongside their respective components of net income and other comprehensive income. As part of this update, the FASB did not defer the requirement to report comprehensive income in either a single continuous statement or in two separate but consecutive statements. In February 2013, the FASB issued ASU No. 2013-02 ("ASU 2013-02"), Comprehensive Income: Reporting of Amounts Reclassified Out of Accumulated Other Comprehensive Income. ASU 2013-02 is effective for interim and annual periods beginning after December 31, 2012. As ASU 2013-02 relates to disclosure requirements only, the application of this update did not have a material impact on the Company's consolidated financial statements.

### 3. Accounts Receivable/Advances on Contracts in Progress

Net accounts receivable, trade and advances on contracts in progress consists of the following at December 31:

(in thousands)	2013	2012
Amounts billed	\$1,396	\$1,927
Accrued revenue	18	238
	1,414	2,165
Less: Allowance for doubtful accounts	—	(28)
Net accounts receivable - trade	\$1,414	\$2,137
Advances on contracts in progress	\$1,433	\$1,037

Accrued revenue represents revenues recognized on contracts for which billings have not been presented to customers as of the balance sheet date. These amounts are billed and generally collected within one year.

The Company maintains allowances for doubtful accounts for estimated losses resulting from the inability of its customers to pay amounts due. The Company actively pursues collection of past due receivables as the circumstances warrant. Customers are contacted to determine the status of payment and senior accounting and operations management are included in these efforts as is deemed necessary. A specific reserve will be established for past due accounts when it is probable that a loss has been incurred and the Company can reasonably estimate the amount of the loss. The Company does not record an allowance for government receivables and invoices backed by letters of credit as realizeability is reasonably assured. Bad debts are written off against the allowance when identified. There is no dollar threshold for account balance write-offs. While rare, a write-off is only recorded when all efforts to collect the receivable have been exhausted. The Company received payments of \$24 thousand and \$10 thousand for the years ended December 31, 2013 and 2012, respectively, against amounts which had been previously reserved for in allowance for doubtful accounts.

Advances on contracts in progress represent billings that have been presented to the customer, as either deposits or progress payments against future shipments, but revenue has not been recognized.

#### 4. Inventories and Deferred Cost of Goods Sold

Inventories, net of \$1,019 thousand and \$860 thousand of reserves at December 31, 2013 and 2012, respectively, and deferred cost of goods sold consist of the following at December 31:

(in thousands)	2013	2012
Raw materials	\$1,310	\$1,784
Work in process	2,004	2,103
Finished goods	502	1,429
Net inventory	\$3,816	\$5,316
Deferred cost of goods sold	\$849	\$185

The Company wrote-off \$62 thousand and \$317 thousand of excess and obsolete inventory for the years ended December 31, 2013 and 2012, respectively.

Deferred cost of goods sold represents costs of equipment that has shipped to the customer and title has passed but not all revenue recognition criteria have yet been met. The Company defers these costs until the related revenue is recognized.

#### 5. Property and Equipment

Property and equipment consists of the following at December 31:

(in thousands)	2013	2012
Machinery and equipment	\$11,783	\$11,657
Furniture fixtures and computer equipment	4,824	4,741
Leasehold improvements	3,894	3,854
Construction in progress	43	119
	20,544	20,371
Accumulated depreciation	(19,603)	(19,174)
	\$941	\$1,197

Depreciation expense from continuing operations relating to property and equipment was approximately \$429 thousand and \$705 thousand for the years ended December 31, 2013 and 2012, respectively.

#### 6. Accrued Liabilities

Accrued liabilities include the following at December 31:

(in thousands)	2013	2012
Accrued employee related	\$689	\$607
Accrued professional fees	397	401
Accrued warranty and product	152	583
Accrued other	1,098	630
	\$2,336	\$2,221

7. Notes Payable and Credit Arrangements

The Company has two separate credit facilities with Silicon Valley Bank (the "Bank" or "SVB"): (i) a Second Amended and Restated Loan and Security Agreement (as amended, the "Revolving Credit Facility") and (ii) an Amended and Restated Export-Import Bank Loan and Security Agreement (as amended, the "Ex-Im Facility") pursuant to which outstanding amounts

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under this facility are guaranteed by the Export-Import Bank of the United States (the “EXIM Bank”). The credit facilities provide an aggregate amount of \$1.5 million under both facilities, with up to \$1.0 million available under the Revolving Credit Facility and up to \$1.5 million available under the Ex-Im Facility. In addition, a guidance line supports letters of credit in an aggregate amount of up to \$1.5 million through April 30, 2014. If the Company achieves certain levels of liquidity, based on cash on hand and availability under the credit facility, the Company will not be required to cash collateralize letters of credit issued under this guidance line.

On September 3, 2013, the Company and the Bank entered into (i) the Sixth Loan Modification Agreement amending certain terms of the Second Amended and Restated Loan and Security Agreement dated as of November 16, 2009 (as amended, the “Revolving Credit Facility”) and (ii) the Sixth Loan Modification Agreement amending certain terms of the Amended and Restated Export-Import Bank Loan and Security Agreement dated as of November 16, 2009 (as amended, the “Ex-Im Facility”). Pursuant to the terms of the Sixth Loan Modification Agreements, the Company and the Bank agreed to extend the maturity date of the Revolving Credit Facility and the Ex-Im Facility to October 29, 2013 .

On November 18, 2013, the Company and the Bank entered into (i) the Seventh Loan Modification Agreement amending certain terms of the Second Amended and Restated Loan and Security Agreement dated as of November 16, 2009 (as amended, the “Revolving Credit Facility”) and (ii) the Seventh Loan Modification Agreement amending certain terms of the Amended and Restated Export-Import Bank Loan and Security Agreement dated as of November 16, 2009 (as amended, the “Ex-Im Facility”). Pursuant to the terms of the Seventh Loan Modification Agreements, the Company and the Bank agreed to (i) extend the maturity date of the Revolving Credit Facility and the Ex-Im Facility to from October 29, 2013 to April 30, 2014, (ii) effective November 18, 2013 amend the definition of the Financial Covenant by deleting the requirement to maintain liquidity of at least \$1.25 million at all times based on cash on hand and availability under the credit facility and replacing it with a newly defined covenant whereby the Company shall maintain cash on hand of at least \$2.5 million at all times, as long as any commitment remains outstanding under the facilities, and (iii) amend the definition of Streamline Facility Eligible to increase the liquidity requirement from \$2.5 million to \$3.5 million.

The Company's obligations under these two credit facilities, as well as the guidance line, are secured by substantially all of the assets of the Company. Advances under the Revolving Credit Facility are limited to 80% of eligible receivables. Advances under the Ex-Im Facility are limited to (i) 90% of eligible receivables subject to a suitable foreign currency hedge agreement if applicable, plus (ii) 75% of all other eligible receivables billed in foreign currency, plus (iii) 50% of the value of eligible inventory, as defined. In addition, until all amounts under the credit facilities with the Bank are repaid, covenants under the credit facilities impose restrictions on the Company's ability to, among other things, incur additional indebtedness, create or permit liens on the Company's assets, merge, consolidate or dispose of assets (other than in the ordinary course of business), make dividend and other restricted payments, make certain debt or equity investments, make certain acquisitions, engage in certain transactions with affiliates or change the business conducted by the Company. Any failure by the Company to comply with the covenants and obligations under the credit facilities could result in an event of default, in which case the Bank may be entitled to declare all amounts owed to be due and payable immediately.

Under the credit facilities, interest on outstanding borrowings accrues at a rate per annum equal to the greater of (i) the prime rate plus 2.5% or (ii) 7.0%. In addition, if the Company achieves certain levels of liquidity, based on cash on hand and availability under the credit facility, the Company will have a 0.5% lower interest rate.

N2 Bio has two separate agreements under one credit facility with Middlesex Savings Bank (“MSB”): (i) a Secured Term Loan and (ii) a Secured Revolving Demand Note. Under the Secured Term Loan, N2 Bio borrowed \$6.0 million on September 18, 2013 to finance the purchase of the Bio Business Unit from the Company. The advance made under



the Secured Term Loan will bear interest at a fixed rate of 4.5% per annum in eighty-four (84) consecutive monthly payments starting on October 18, 2013. If not sooner paid, the Secured Term Loan shall be due and payable in full on September 18, 2020. The Secured Revolving Demand Note provides an amount available of up to \$1.0 million. Advances made under the Secured Revolving Demand Note will bear interest at MSB's prime rate, as determined, plus 0.5% per annum but in no event shall the interest rate be less than 3.75% per annum. The maturity date of the Secured Revolving Demand Note is September 18, 2014.

N2 Bio's obligations under the credit facility, is secured by substantially all of the assets of N2 Bio. Advances under the Secured Revolving Demand Note are limited to 75% of eligible receivables. In addition, until all amounts under the credit facilities with MSB are repaid, covenants under the credit facilities impose restrictions on the N2 Bio's ability to, among other things, incur additional indebtedness, create or permit liens on the N2 Bio's assets, merge, consolidate or dispose of assets (other than in the ordinary course of business), make dividend and other restricted payments, make certain debt or equity investments, make certain acquisitions, engage in certain transactions with affiliates or change the business conducted by the N2 Bio. Any failure by N2 Bio

to comply with the covenants and obligations under the credit facilities could result in an event of default, in which case MSB may be entitled to declare all amounts owed to be due and payable immediately.

Advances outstanding under the Company's Revolving Credit Facility were \$107 thousand and \$449 thousand at December 31, 2013 and 2012, respectively. Advances outstanding under the Company's Ex-Im Facility were \$38 thousand and \$141 thousand at December 31, 2013 and 2012, respectively. Advances outstanding under the N2 Bio Secured Term Loan were \$5.8 million at December 31, 2013. Advances outstanding under the N2 Bio Secured Revolving Demand Note were \$438 thousand at December 31, 2013. As of December 31, 2013, the interest rate per annum on the Company's Revolving Credit Facility and Ex-Im Facility was 6.0% and 6.0%, respectively. The interest rate per annum on the N2 Bio Secured Term Loan and Secured Revolving Demand Note on December 31, 2013 was 4.50% and 3.75%, respectively. The Company had utilized \$675 thousand of the guidance line at December 31, 2012. Combined availability under the Revolving Credit Facility, the Ex-Im Facility and the Secured Revolving Demand Note was \$581 thousand as of December 31, 2013.

## 8. Fair Value Measurements

The hierarchy established under ASC 820-10, Fair Value Measures and Disclosures ("ASC 820-10") gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). As required by ASC 820-10, the Company's available-for-sale investments are classified within the fair value hierarchy based on the lowest level of input that is significant to the fair value measurement. The three levels of the fair value hierarchy under ASC 820-10, and its applicability to the Company's available-for-sale investments, are described below:

Level 1 - Pricing inputs are quoted prices available in active markets for identical investments as of the reporting date. As required by ASC 820-10, the Company does not adjust the quoted price for these investments, even in situations where the Company holds a large position and a sale could reasonably impact the quoted price.

Level 2 - Pricing inputs are quoted prices for similar investments, or inputs that are observable, either directly or indirectly, for substantially the full term through corroboration with observable market data. Level 2 includes investments valued at quoted prices adjusted for legal or contractual restrictions specific to these investments.

Level 3 - Pricing inputs are unobservable for the investment, that is, inputs that reflect the reporting entity's own assumptions about the assumptions market participants would use in pricing the asset or liability. Level 3 includes investments that are supported by little or no market activity.

### Valuation Techniques

Fair value is a market-based measure considered from the perspective of a market participant who would buy the asset or assume the liability rather than the Company's own specific measure. All of the Company's fixed income securities are priced using a variety of daily data sources, largely readily-available market data and broker quotes. To validate these prices, the Company compares the fair market values of the Company's fixed income investments using market data from observable and corroborated sources. The Company also performs the fair value calculations for its common stock and mutual fund securities using market data from observable and corroborated sources. In periods of market inactivity, the observability of prices and inputs may be reduced for certain instruments. This condition could cause an instrument to be reclassified from Level 1 to Level 2 or from Level 2 to Level 3. During twelve months ended December 31, 2013, none of the Company's instruments were reclassified between Level 1, Level 2 or Level 3 and there have been no changes in valuation techniques.

The following table presents the financial instruments related to the Company's available-for-sale investments carried at fair value on a recurring basis as of December 31, 2013 and 2012 by ASC 820-10 valuation hierarchy (as defined above).

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(in thousands)	Balance of December 31, 2013	Level 1	Level 2	Level 3
Cash and short term investments	\$927	\$927	\$—	\$—
Common Stock				
Basic Materials	14	14	—	—
Consumer Goods	97	97	—	—
Energy	65	65	—	—
Financial	111	111	—	—
Healthcare	104	104	—	—
Industrial Goods	109	109	—	—
Services	21	21	—	—
Technology	557	557	—	—
Transportation	—	—	—	—
Utilities	9	9	—	—
Total Common Stock	1,087	1,087	—	—
Mutual Fund				
Diversified Emerging Markets	193	—	193	—
Precious Metals Fund	—	—	—	—
Foreign Large Blend	287	—	287	—
Foreign Large Growth	175	—	175	—
Large Growth	163	—	163	—
Small Blend	189	189	—	—
Global High Yield Income Fund	38	—	38	—
Total Mutual Funds	1,045	189	856	—
Fixed Income				
Domestic	413	—	413	—
International	63	—	63	—
Total Fixed Income	476	—	476	—
Total available for-sale-investments <sup>(1)</sup>	\$3,535	\$2,203	\$1,332	\$—
Percent of total	100	% 62	% 38	% —

(in thousands)	Balance of December 31, 2012	Level 1	Level 2	Level 3
Cash and short term investments	\$ 32	\$ 32	\$—	\$—
Common Stock				
Basic Materials	15	15	—	—
Consumer Goods	58	58	—	—
Financial	61	61	—	—
Healthcare	52	52	—	—
Industrial Goods	51	51	—	—
Services	32	32	—	—
Technology	376	376	—	—
Total Common Stock	708	708	—	—
Mutual Fund				
Diversified Emerging Markets	187	—	187	—
Foreign Large Blend	244	—	244	—
Foreign Large Growth	250	—	250	—
Large Growth	220	—	220	—
Small Blend Total	525	525	—	—
Total Mutual Funds	1,527	525	1,002	—
Fixed Income				
Domestic	678	—	678	—
International	18	—	18	—
Total Fixed Income	696	—	696	—
Total available for-sale-investments <sup>(1)</sup>	\$ 2,963	\$ 1,265	\$ 1,698	\$—
Percent of total	100	% 43	% 57	% —

(1) Changes in the fair value of available-for-sale investments are recorded in accumulated other comprehensive income, a component of stockholders' equity, in the Company's consolidated balance sheets.

The carrying amounts reflected in the Company's consolidated balance sheets for cash, accounts receivable, prepaid expenses and other current assets, accounts payable, accrued expenses, and capital lease obligations approximates fair value due to their short-term nature and classifies the valuation techniques that use Level 3 inputs. The fair value of the Company's term loan and revolving lines of credit has been estimated by management based on the terms that it believes it could obtain in the current market for debt of the same terms and similar remaining maturities. Due to the short-term nature of the remaining maturities, recent issuances, frequency of amendments to its terms and the variable interest rates, the carrying value of the term loan and revolving lines of credit approximates fair value at December 31, 2013 and 2012 and the Company valuation techniques use Level 3 inputs.

## 9. Share-Based Compensation

The Company has recognized share-based compensation expense from continuing operations of approximately \$100 thousand and \$202 thousand for the years ended December 31, 2013 and 2012, respectively. The total non-cash, share-based compensation expense from continuing operations included in the consolidated statements of operations for the years ended is included in the following expense categories:

(in thousands)	Year Ended December 31,	
	2013	2012
Cost of contract research, services	\$ 11	\$ 20

Cost of goods sold	7	32
Administrative and selling	82	150
Total share-based compensation	\$ 100	\$ 202

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Share-based compensation expense from discontinued operations was zero and \$(7) thousand for the years ended December 31, 2013 and 2012, respectively. No share-based compensation expense was capitalized during 2013 and 2012. Compensation expense related to stock options to be charged in future periods amounts to approximately \$19 thousand at December 31, 2013 and will be recognized over a weighted-average period of 0.58 years as follows:

For the years ended December 31,	Expected Compensation Expense (in thousands)
2014	\$19
	\$19

The Company estimates forfeitures at the time of grant and revises, if necessary, in subsequent periods if actual forfeitures differ from those estimates in order to derive the Company's best estimate of awards ultimately expected to vest. Forfeitures represent only the unvested portion of a surrendered option and are typically estimated based on historical experience.

At December 31, 2013, the Company had outstanding options under two stock option plans: the 1996 Equity Incentive Plan (the "1996 Plan") and the 2007 Stock Equity Plan (the "2007 Plan", together the "Plans"). Both Plans were approved by stockholders and provided that the Board of Directors may grant options to purchase the Company's common stock to key employees and directors of the Company. Incentive and non-qualified options must be granted at least at the fair market value of the common stock or, in the case of certain optionees, at 110% of such fair market value at the time of grant. The options may be exercised, subject to certain vesting requirements, for periods up to ten years from the date of issue. The 1996 Plan expired with respect to the issuance of new grants as of December 10, 2006. Accordingly, future grants may be made only under the 2007 Plan.

A summary of options outstanding under the Plans as of December 31, 2013 and changes during the twelve month period ended December 31, 2013 is as follows:

	Number of Shares	Weighted Average Exercise Price	Average Remaining Contractual Life (Years)	Aggregate Intrinsic Value  (in thousands)
Options outstanding at December 31, 2012	644,446	\$6.21		
Granted	36,000	\$0.50		
Exercised	—	\$—		
Cancelled/expired	(153,200 )	\$6.01		
Options outstanding at December 31, 2013	527,246	\$5.88	5.20	\$3
Options vested and exercisable at December 31, 2013	513,496	\$5.92	5.16	\$3
Options vested and expected to vest at December 31, 2013	526,771	\$5.91	5.16	\$—
Options available for future grant at December 31, 2013	478,759			

The aggregate intrinsic value in the table above represents the total intrinsic value, based on the Company's closing stock price of \$0.54 as of December 31, 2013, which would have been received by the option holders had all option holders exercised their options as of that date. The total intrinsic value of options exercised was approximately zero and zero for the years ended December 31, 2013 and 2012, respectively. The total intrinsic value of options expected to vest at December 31, 2013 was approximately zero, and the weighted average remaining contractual life of

outstanding options that are expected to vest is 5.15 years.

The per-share weighted-average fair value of stock options granted was \$0.50 and \$1.78 for the years ended December 31, 2013 and 2012, respectively, on the date of grant using the Black-Scholes option-pricing model with the following weighted-average assumptions:

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Year	Expected Dividend Yield	Risk-Free Interest Rate	Expected Option Life	Expected Volatility Factor	
2013	—	1.08	% 5.10 years	106.4	%
2012	—	0.71	% 5.10 years	93.3	%

The risk free interest rate reflects treasury yields rates over a term that approximates the expected option life. The expected option life is calculated based on historical lives of all options issued under the Plans. The expected volatility factor is determined by measuring the actual stock price volatility over a term equal to the expected useful life of the options granted.

#### 10. Accumulated Other Comprehensive Income

Changes in accumulated other comprehensive income balances by component for the year ended December 31, 2013 consist of the following:

(in thousands)	Unrealized Gains (Losses) on Available for Sale Securities
Balance, December 31, 2012	\$ 222
Other comprehensive income before reclassification	467
Amounts reclassified from accumulated other comprehensive income	(296 )
Net current-period change in other comprehensive income	171
Balance, December 31, 2013	\$ 393

Reporting reclassifications out of accumulated other comprehensive income for the year ended December 31, 2013 consist of the following:

Details about Accumulated Other Comprehensive Income Components	Amount Reclassified from Accumulated Other Comprehensive Income (in thousands)	Affected Line Item in the Statement Where Net Income is Resented
Realized gains on available-for-sale investments	(296 )	Selling, general and administrative expenses

#### 11. Income Taxes

The Company recorded a net income tax benefit of \$2 thousand and \$3 thousand for the years ended December 31, 2013 and 2012, respectively. The Company recorded a tax benefit on the loss from continuing operations of \$2 thousand and \$2.0 million for the years ended December 31, 2013 and 2012, respectively, which was offset by a provision on the income from discontinued operations of zero and \$1.9 million for the years ended December 31, 2013 and 2012, respectively. The discontinued operations is associated with the sale of the Company's Semiconductor Business Unit and Medical Products Business Unit. See Note 18 to the consolidated financial statements. The loss generated from continuing operations for the year ended December 31, 2013, was offset by a taxable gain recognized

on the sale of the Bio Business Unit to N2 Bio. As mentioned in Note 19, since this transaction was a sale between entities under common control, no gain was recognized for financial reporting purposes.

The reconciliation between the amount computed by applying the United States federal statutory tax rate of 34% to pretax income (loss) and the actual benefit (provision) for income taxes follows:

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(in thousands)	2013	2012
Income tax benefit (provision) – continuing operations at statutory rate	\$(2,872)	\$2,289
Increase in valuation allowance related to income tax expense	161	(461)
State income tax benefit	34	211
Taxable gain on sale between entities under common control	2,619	—
Other	60	(88)
Income tax benefit – continuing operations	2	1,951
Income tax provision – discontinued operations at statutory rate	—	(1,656)
State income taxes – discontinued operations	—	(292)
Income tax provision – discontinued operations	—	(1,948)
Total income tax benefit (provision)	\$2	\$3

The tax effects of temporary differences that give rise to significant portions of deferred tax assets and deferred tax liabilities are as follows:

(in thousands)	2013	2012
Deferred tax assets:		
Accruals	\$1,997	\$1,992
Inventories	420	365
Other	477	—
Net operating loss carryforwards	4,733	4,705
General business credit carryforwards	388	403
Alternative minimum tax credit carryforwards	268	268
Foreign tax credit	—	38
Total gross deferred tax assets	8,283	7,771
Prepaid expenses	(294)	(251)
Depreciation	215	130
Amortization	(53)	(79)
Total gross deferred tax liabilities	(132)	(200)
Valuation allowance	(8,151)	(7,571)
Net deferred tax assets	\$—	\$—

The net change in the total valuation allowance for the period ended December 31, 2013 was an increase of \$580 thousand. Federal and state net operating loss carryforwards were approximately \$13.9 million and \$7.3 million, respectively, as of December 31, 2013. The federal net operating loss carryforwards will expire at various times starting in 2026 through 2033, if not utilized. The state net operating loss carryforwards will expire at various times starting in 2014 through 2033, if not utilized. Included in the Federal net operating loss carryforwards were approximately \$3.5 million attributable to equity based compensation transactions. Approximately \$1.0 million of the valuation allowance will be relieved through equity if these deductions for equity based transactions are realized. Under Section 382 of the Internal Revenue Code, certain substantial changes in the Company's ownership may limit the amount of net operating loss carryforwards that can be utilized in any one year to offset future taxable income.

The tax years of 2010 through 2013 remain open to examination by major taxing jurisdictions to which the Company is subject. In addition, because the Company has net operating loss carryforwards for the years ended December 31,

2006, 2007 and 2009, the Internal Revenue Service and the state taxing authorities are permitted to audit those earlier years and propose adjustments up to the amount of net operating loss generated. The Company is currently not under examination by the Internal Revenue Service or any other jurisdiction for any tax years. At December 31, 2013, the Company does not have any uncertain tax positions, unrecognized tax benefits and did not recognize any interest or penalties. The Company does not expect there to be a change in unrecognized tax benefits over the next twelve months.

12. Commitments

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## Letters of Credit

Outstanding letters of credit totaled \$170 thousand and \$675 thousand at December 31, 2013 and 2012, respectively. The letters of credit secure performance obligations and purchase commitments, and allow holders to draw funds up to the face amount of the letter of credit if the Company does not perform as contractually required. The outstanding letters of credit at December 31, 2013 were secured by restricted cash. The outstanding letters of credit at December 31, 2012 were secured by the Revolving Credit Facility and Ex-Im Facility.

## Purchase Obligations

Included in purchase obligations are raw materials, equipment and services needed to fulfill customer orders. During the normal course of business, in order to manage manufacturing lead times and help assure an adequate supply, the Company enters into agreements with suppliers that either allow the Company to procure goods and services when it chooses or that establish purchase requirements. In certain instances, the agreements with purchase requirements allow the Company the option to cancel, reschedule, or adjust its requirements based on the Company's business needs prior to firm orders being placed. Consequently, only a portion of the Company's purchase obligations are firm, non-cancelable and unconditional. At December 31, 2013, the Company's obligations under firm, non-cancelable, and unconditional agreements were \$516 thousand, of which, \$510 thousand of the Company's purchase obligations are due in 2014.

## Property Under Capital Leases and Lease Commitments

At December 31, 2013 and 2012, the Company including the variable interest entity, N2 Bio, had operating and capital leases for office space and office equipment. At December 31, 2013, future minimum lease payments for the period ended are as follows:

(in thousands)	Unrelated Party Operating Leases	Related Party Operating Leases	Unrelated Party Capital Leases
2014	\$63	\$2,386	\$8
2015	16	2,458	—
2016	12	2,530	—
2017	1	2,421	—
2018	—	502	—
Thereafter	—	998	—
Total minimum lease payments	\$92	\$11,295	8
Less: amounts represented by interest			—
Present value of monthly lease payments			8
Less: current portion of unrelated party capital lease obligation			(8
Long-term portion of unrelated party capital lease obligation			\$— )

## Unrelated Party Capital Lease

In August 2009 the Company entered into a lease for information technology storage equipment whereby the Company agreed to pay \$73 thousand over a five year term expiring in July 2014. The lease agreement did not

provide for a transfer of ownership at any point. Interest costs were assumed at 11%. Interest expense was approximately \$2 thousand and \$3 thousand for the year ended December 31, 2013 and 2012, respectively. This lease was classified as a unrelated party capital lease.

In September 2009 the Company entered into a lease for information technology storage equipment whereby the Company agreed to pay \$120 thousand over a three year term expiring in August 2012. The lease agreement did not provide for a transfer of ownership at any point. Interest costs were assumed at 13%. Interest expense was approximately \$1 thousand for the year ended December 31, 2012. This lease was classified as a unrelated party capital lease.

#### Unrelated Party Operating Leases

Unrelated party operating leases expire at various times thru 2017 and primarily consist of leases for automobiles and office equipment.

#### Related Party Operating Lease

On November 30, 2007, the Company entered into a new Lease Agreement (the "Bedford Lease") with SPI-Trust, a Trust of which Roger G. Little, Chairman of the Board of the Company, is the sole trustee and principal beneficiary, with respect to 144 thousand square feet of space comprising the entire building in which the Company has occupied space since December 1, 1985. The term of the Bedford Lease commenced on December 1, 2007 and was originally set to expire on November 30, 2012. The annual rental rate for the first year of the Bedford Lease was \$12.50 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increased on each anniversary by \$0.75 per square foot.

On September 17, 2010, the Company entered into the First Amendment to Lease Agreement with SPI-Trust to amend the Bedford Lease. The term of the Bedford Lease was extended for an additional 5 years to expire on November 30, 2017. The annual rental rate for the first year of the extended term (December 1, 2012 through November 30, 2013) is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. After the first year of the extended term of the Bedford Lease, the annual rental rate increases on each anniversary by \$0.50 per square foot. The Company has the right to further extend the term of the Bedford Lease for an additional 5 years. If the Company exercises this right to further extend the term of the Bedford Lease, the annual rental rate for the first year of the further extended term will be the greater of: (a) the rental rate in effect immediately preceding the commencement of the extended term; or (b) the market rate at such time, and on each anniversary of the commencement of the extended term the rental rate will increase by \$0.50 per square foot. Additionally, SPI-Trust agreed to reimburse the Company up to \$50 thousand for all costs incurred by the Company in connection with any alterations or improvements to the premises or repairs or replacements to the heating and air conditioning systems.

On September 18, 2013, the Company entered into the Second Amendment to Lease Agreement with SPI-Trust to amend the Bedford Lease. The leased portion of the premises and annual base rent in Bedford, Massachusetts was reduced by approximately 19%. All other material terms and conditions related to the lease remain unchanged as of such date. The Company believes that the terms of the Bedford Lease, as amended, are commercially reasonable. Rent expense from continuing operations under the Bedford Lease was \$2.2 million and \$2.3 million for the years ended December 31, 2013 and 2012, respectively.

On September 18, 2013, N2 Bio entered into a Lease Agreement (the "N2 Bio Bedford Lease") with SPI-Trust with respect to 27 thousand square feet of space in the premises in Bedford, Massachusetts. The term of the N2 Bio Bedford Lease commenced on September 18, 2013 and is set to expire on November 30, 2020. The annual rental rate prorated for September 18, 2013 to November 30, 2013 is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on December 1, 2013 and each anniversary thereafter by \$0.50 per square foot. The Company believes that the terms of the N2 Bio Bedford Lease are commercially reasonable. Rent expense under the N2 Bio Bedford Lease was \$137 thousand for year ended December 31, 2013.

On August 29, 2008, the Company entered into a new Lease Agreement (the "Hudson Lease") with SPI-Trust, with respect to 90 thousand square feet of space comprising the entire building in which Spire Semiconductor has occupied space since June 1, 2003. The term of the Hudson Lease commenced on September 1, 2008, and was to continue for 7 years until August 31, 2015. The annual rental rate for the first year of the Hudson Lease was \$12.50 per square foot

on a triple-net basis, whereby the tenant was responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increased on each anniversary by \$0.75 per square foot. In addition, the Company was required to deposit with SPI-Trust \$300 thousand as security for performance by the Company for its covenants and obligations under the Hudson Lease. SPI-Trust is responsible, at its sole expense, to make certain defined tenant improvements to the building. The Company believes that the terms of the Hudson Lease were commercially reasonable and reflective of market rates. The Hudson Lease was classified as a related party operating lease. Rent expense from continuing operations under the Hudson Lease was zero and \$119 thousand for the years ended December 31, 2013 and 2012, respectively. Rent expense from discontinued operations under the Hudson Lease was zero and \$134 thousand for the years ended December 31, 2013 and 2012, respectively. In connection with sale of the Semiconductor Business Unit, the lease was terminated on March 9, 2012 and the Company was released from all future obligations under the lease as of such date. The security deposit of \$300 thousand was used to off-set rent payments in the first quarter of 2012. See Note 17 to the consolidated financial statements.

13. Employee Benefit Plans

Profit Sharing Plan

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In 1985, the Company adopted a profit sharing plan under Section 401(k) of the Internal Revenue Code. This plan allows employees to defer up to 17.5% of their income up to certain dollar limits on a pretax basis through contributions to the plan. The Company began discretionary matching contributions starting September 2008. The Company's matching contributions were approximately \$174 thousand and \$155 thousand for the year ended December 31, 2013 and 2012, respectively.

#### Deferred Compensation Plan

Effective January 1, 2002, the Company adopted the Spire Corporation Non-Qualified Deferred Compensation Plan (the "Plan") for Roger Little, Chairman of the Board, Chief Executive Officer and President of the Company (the "Participant"). Under this Plan, the Company makes equal monthly contributions to the Spire Corporation Non-Qualified Deferred Compensation Trust (the "Trust") up to the annually required amount of \$250 thousand. The Company records these contributions as selling, general and administrative expense when made. The Trustee makes all investment decisions for the Trust on behalf of the Participant. The Company has not guaranteed a return on investment for the Participant, however, all earnings and losses on the Plan assets are borne by the Participant. All contributions and earnings are fully vested to the Participant when made but are subject to the Company's creditors in the event of bankruptcy. As a result, the assets held in the Plan have been recorded as available-for-sale investments in the consolidated balance sheets with a corresponding liability being recorded as deferred compensation. Unrealized gains and losses on the available-for-sale investments are recorded as accumulated other comprehensive income within the equity section of the consolidated balance sheets. A corresponding entry to deferred compensation is made to increase (decrease) the amounts due the Participant resulting from the changes in the asset value with an offsetting charge or credit to selling, general and administrative expense.

On November 17, 2011, the Compensation Committee of the Board of Directors of the Company approved an amendment to the Plan for the Participant to permit the Participant to elect, subject to Compensation Committee approval, to receive all or any part of the deferred portion of the Participant's compensation under the Plan in shares of the Company's common stock in lieu of cash. The number of shares to be issued in lieu of such deferred compensation shall be equal to the dollar amount that would otherwise be credited to the Plan divided by the closing sale price per share of common stock on the date on which the Compensation Committee approves the Participant's election. The shares shall be issued under, and be subject to the terms, conditions and limitations of, the Company's 2007 Stock Equity Plan (the "2007 Plan"). The Plan permits one election to be made with respect to accumulated deferred compensation for 2010 and 2011 and, commencing in 2012, elections shall be made on a quarterly basis. All such elections shall be subject to and be contingent upon approval of the Compensation Committee. On November 17, 2011, the Participant elected to receive aggregate accumulated deferred compensation of \$500 thousand for 2010 and 2011 in shares of common stock (and the Compensation Committee approved such election), which, based on the closing sale price of the Company's common stock on such date (\$0.78), is equal to approximately 641,025 shares. On June 21, 2012, the Participant elected to receive aggregate accumulated deferred compensation of \$63 thousand for the third quarter of 2012 in shares of common stock (and the Compensation Committee approved such election), which, based on the closing sale price of the Company's common stock on such date (\$0.69), is equal to approximately 90,580 shares. On August 16, 2012, the Participant elected to receive aggregate accumulated deferred compensation of \$63 thousand for the fourth quarter of 2012 in shares of common stock (and the Compensation Committee approved such election), which, based on the closing sale price of the Company's common stock on such date (\$0.55), is equal to approximately 113,636 shares. Because of limitations on awards under the 2007 Plan, the Trust was issued 500,000 of such shares, valued at approximately \$384 thousand and issued 145,242 of such shares, valued at approximately \$84 thousand, in 2012 and 2013, respectively. Compensation expense from continuing operations was approximately \$250 thousand and \$250 thousand in the years ended December 31, 2013 and 2012,

respectively. Accrued compensation expense related to the Plan was \$375 thousand and \$209 thousand at December 31, 2013 and 2012, respectively. The Participant retired as Chief Executive Officer and President of the Company on December 31, 2013. The Participant received a partial deferred compensation payment of approximately \$1.2 million in January 2014 and has the ability to receive the remaining deferred compensation balance on July 1, 2014. The deferred compensation balance at December 31, 2013 is classified in total current liabilities and the corresponding assets that would be used to settle the obligation are classified in total current assets.

14. Loss Per Share

The following table provides a reconciliation of the denominators of the Company's reported basic and diluted loss per share computations for the years ended December 31:

	2013	2012
Weighted average number of common and common equivalent shares outstanding – basic	9,176,438	8,579,027
Add: Net additional common shares upon assumed exercise of common stock options	—	—
Weighted average number of common and common equivalent shares outstanding – diluted	9,176,438	8,579,027

For the years ended December 31, 2013 and 2012, 4,842 and 1,490 shares of common stock, respectively, issuable relative to stock options were excluded from the calculation of diluted shares because their inclusion would have been anti-dilutive, due to the Company's net loss position.

In addition, for the years ended December 31, 2013 and 2012, 485,246 and 624,446 shares of common stock, respectively, issuable relative to stock options were excluded from the calculation of diluted shares because their inclusion would have been anti-dilutive, due to the Company's exercise prices exceeding the average market price of the stock for the period.

#### 15. Legal Matters

From time to time, the Company is subject to legal proceedings and claims arising from the conduct of its business operations.

On February 4, 2011, Silicon International Ltd. ("SI") filed a complaint in Suffolk Superior Court in Massachusetts, and on February 11, 2011 served a summons, against the Company alleging breach of contract related to SI's activities acting as a former sales and service representative of the Company within China. The complaint makes claims regarding amounts allegedly owed to SI by the Company, specifically with regard to allegedly owed commissions. SI is seeking payment of commissions allegedly owed to it. The Company filed its answer and counterclaims against SI on February 24, 2011, denying SI's allegations, and claiming that SI interfered in the Company's business relationships and generally engaged in multiple breaches of contract against the Company. In January 2013, both parties filed formal opposition to the opposing parties' motion to dismiss various claims and allegations. In July 2013, the court denied the Company's motion and allowed in part and denied in part the plaintiff's motion. A trial date has been scheduled for April 2014. The ultimate outcome of this legal matter cannot be predicted with certainty, based on current information, including the Company's assessment of the merits of the particular claim. It is not possible at this time to provide meaningful estimates as to amount or range of potential loss, but the Company does not expect that these legal proceedings or claims will have any material adverse affect on the Company's future results of operations, financial position or cash flows.

On December 10, 2013, Stifel, Nicolaus & Company, Inc. ("Stifel") filed a complaint in the Southern District of New York Court, and on December 18, 2013, served a summons, against the Company alleging breach of contract related to Stifel's activities acting as an investment banker for the Company. The complaint makes claims regarding amounts allegedly owed to Stifel by the Company, specifically with regard to allegedly owed fees for certain advisory services which amounts have been provided for. On December 12, 2013, the Company filed a complaint in Middlesex Superior Court in Massachusetts, and on December 31, 2013, served a summons against Stifel alleging breach of contract related to Stifel's activities acting as an investment banker for the Company. The Company's complaint makes claims regarding Stifel providing certain advisory services to the Company. The ultimate outcome of this legal matter cannot be predicted with certainty, based on current information, including the Company's assessment of the merits of the particular claim. It is not possible at this time to provide meaningful estimates as to amount or range of potential loss,

but the Company does not expect that these legal proceedings or claims will have any material adverse effect on the Company's future results of operations, financial position or cash flows.

The Company is not aware of any other current or pending legal proceedings to which it is or may be a party that it believes could materially adversely affect its results of operations or financial condition or cash flows.

#### 16. Operating Segments and Related Information

The Company's operations are focused on two primary business areas: Spire Solar (comprised of solar equipment, solar systems and solar research) and Spire Biomedical (comprised of biomedical surface treatments and biophotonics research). Spire Solar and Spire Biomedical operate out of the Company's facility in Bedford, Massachusetts. Each business area is independently managed and has separate financial results that are reviewed by the Board of Directors and Chief Executive Officer and the chief executive officers of each operating division.

On September 18, 2013, the Company completed the sale of the Bio Business Unit to N2 Bio, whereas, the Company has a controlling financial interest in N2 Bio and is less than wholly-owned by the Company. N2 Bio qualifies as a variable interest entity and the Company is determined to be the primary beneficiary, therefore assets, liabilities and results of operations of N2 Bio are consolidated into the Company's financial statements. The Bio Business Unit is being reported in our biomedical segment. See Note 19 to the consolidated financial statements.

During the first quarter of 2012, the Company began pursuing an exclusive sales process of our semiconductor business and on March 9, 2012, the Company completed the sale of the Semiconductor Business Unit to Masimo Corporation. The Company reported the Semiconductor Business Unit as discontinued operations beginning with our financial results presented in our Quarterly Report on Form 10-Q for the first quarter of fiscal 2012. The Semiconductor Business Unit was previously reported as our optoelectronics segment. Accordingly, the results of operations and assets and liabilities of the Semiconductor Business Unit are being presented herein as discontinued operations and are not included in the table below. See Note 18 to the consolidated financial statements.

During the second quarter of 2009, the Company began pursuing an exclusive sales process of our medical products business and, on December 14, 2009, the Company completed the sale the Medical Products Business Unit to Bard Access Systems, Inc. The Company reported the Medical Products Business Unit as discontinued operations beginning with our financial results presented in our Quarterly Report on Form 10-Q for the second quarter of fiscal 2009. The Medical Products Business Unit was previously part of our biomedical segment. Accordingly, the results of operations and liabilities of the Medical Products Business Unit are being presented herein as discontinued operations and are not included in the table below. See Note 18 to the consolidated financial statements.

The following table presents certain continuing operating division information in accordance with the provisions of ASC 280, Segment Reporting.

(in thousands)	Spire Solar	Spire Biomedical	Corporate	Total Company
December 31, 2013				
Net sales and revenues	\$7,651	\$6,930	\$—	\$14,581
Operating loss from continuing operations	(8,297	) (79	) —	(8,376 )
Total assets	6,354	1,560	8,155	16,069
Purchase of property and equipment	16	103	20	139
Depreciation and amortization	213	162	134	509
Share-based compensation	21	24	55	100
	Spire Solar	Spire Biomedical	Corporate	Total Company
December 31, 2012				
Net sales and revenues	\$15,255	\$6,855	\$—	\$22,110
Operating income (loss) from continuing operations	(7,280	) 677	—	(6,603 )
Total assets	7,757	1,499	6,651	15,907
Purchase of property and equipment	83	8	52	143
Depreciation and amortization	369	208	227	804
Share-based compensation	61	43	98	202

Operating income (loss) from continuing operations is net sales less cost of sales, selling, general and administrative expenses and gain on termination of contracts, but is not affected by non-operating income (expense), by income taxes

or by net income (loss) from discontinued operations. In calculating operating income (loss) from continuing operations for individual business units, substantial administrative expenses incurred at the operating level that are common to more than one segment are allocated on a net sales basis. Certain corporate expenses of an operational nature are also allocated to the divisions based on factors including occupancy, employment, and purchasing volume. All intercompany transactions have been eliminated.

The following table shows net sales and revenues by geographic area (based on customer location) for the years ended December 31:

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(in thousands)	2013	%	2012	%	
United States	\$9,651	66	% \$10,436	47	%
Asia	2,491	17.0	% 7,971	36	%
Europe / Africa	2,194	15.0	% 3,628	17	%
Rest of the world	245	2	% 75	—	%
	\$14,581	100	% \$22,110	100	%

Revenues from contracts with United States government agencies for 2013 and 2012 were approximately \$707 thousand and \$1.8 million, or 5% and 8% of consolidated net sales and revenues, respectively.

Revenues from the delivery of biomedical services to Stryker Orthopedics and Biomet, Inc. accounted for 20% and 12% , respectively, of total net sales and revenues for 2013.

Revenues from the delivery of biomedical services to Stryker Orthopedics and revenues from the delivery of solar equipment to First Solar, Inc. accounted for 14% and 12% , respectively, of total net sales and revenues for 2012.

Two customers represented approximately 36% and 17% of net accounts receivable, trade at December 31, 2013 and one customer represented approximately 24% of net accounts receivable, trade at December 31, 2012.

There were no foreign countries that accounted for more than 10% of sales in 2013. Republic of India was the only foreign country that accounted for more than 10% of sales in 2012. Net sales to customers in Republic of India accounted for \$2.8 million in 2012.

#### 17. Gain on Termination of Contracts

In the fourth quarter of 2012, the Company determined that a purchase and sale agreement, as amended, with Evergreen Solar Systems India (P) Ltd. ("Evergreen") related to a module manufacturing line expansion was terminated due to a breach of contract by Evergreen. Evergreen had failed to make payments as required by the agreement and has not responded to numerous communications by the Company. In the fourth quarter of 2012, the Company recognized a gain on termination of contracts of \$35 thousand which relates to Evergreen's non-refundable deposit.

#### 18. Discontinued Operations

The accompanying audited consolidated balance sheets, statements of operations and cash flows present the results of operations and assets and liabilities of the Semiconductor Business Unit and the results of operations and liabilities of the Medical Products Business Unit as discontinued operations.

##### Sale of Medical Products Business Unit

On December 14, 2009, the Company completed the sale of its medical products business unit, which developed and marketed coated and uncoated hemodialysis catheters and related devices for the treatment of chronic kidney disease (the "Medical Products Business Unit"), to Bard Access Systems, Inc. ("Bard"). Accordingly, the liabilities of the Medical Products Business Unit are being presented herein as discontinued operations.

The company recorded a loss from discontinued operations before the sale of the Medical Product Business Unit of zero and \$150 thousand for the twelve months ended December 31, 2013 and 2012, respectively.

### Sale of Semiconductor Business Unit

During the first quarter of 2012, the Company began pursuing an exclusive sales process of the Company's Semiconductor Business Unit. The Company (i) determined that the Semiconductor Business Unit was a separate component of the Company's business as, historically, management reviewed separately the Semiconductor Business Unit's financial results apart from the Company's ongoing continuing operations, (ii) eliminated the Semiconductor Business Unit's financial results from ongoing operations and (iii) determined that the Company will have no further continuing involvement in the operations of the Semiconductor Business Unit or cash flows from the Semiconductor Business Unit after the sale.



On March 9, 2012, the Company completed the sale of the Semiconductor Business Unit to Masimo. The asset purchase agreement provided that the aggregate purchase price for the Semiconductor Business Unit was \$8.0 million plus the assumption of \$500 thousand in liabilities, with the cash portion of the purchase price being reduced by retained cash, accounts receivable and liabilities assumed by Masimo in excess of the agreed upon assumed liabilities. As a result, in the first quarter of 2012 the Company received approximately \$7.3 million in cash (less the escrow described below) and incurred legal and transaction related fees of \$425 thousand and Masimo assumed approximately \$1.2 million in liabilities. Of the purchase price, approximately \$718 thousand was deposited into an indemnity escrow account for fifteen months to partially secure the Company's obligations for any indemnity claims under the asset purchase agreement. There were no indemnity claims related to the asset purchase agreement and the Company received full payment from the indemnity escrow account in June 2013. In connection with this transaction, the lease for the premises in Hudson, New Hampshire where the Semiconductor Business Unit was located, was terminated on March 9, 2012, and the Company was released from all future obligations under the lease as of such date.

The company recorded a loss from discontinued operations before the sale of the Semiconductor Business Unit of \$430 thousand for the twelve months ended December 31, 2012.

#### Summarized Financial Information of the Discontinued Operations

The assets and liabilities of the Semiconductor Business Unit and the liabilities of the Medical Products Business Unit as of December 31, 2013 and 2012 are as follows:

(in thousands)	December 31, 2013	December 31, 2012
Assets		
Current Assets		
Restricted cash	\$ —	\$ 718
Total current assets of discontinued operations	—	718
Total Assets of discontinued operations	\$ —	\$ 718
Liabilities of Discontinued Operations		
Current liabilities of discontinued operations		
Accrued liabilities	\$ 21	\$ 171
Total current liabilities of discontinued operations	21	171
Total liabilities of discontinued operations	\$ 21	\$ 171

Condensed results of operations relating to the Medical Products Business Unit and the Semiconductor Business Unit for the year ended December 31, 2013 and 2012 are as follows:

(in thousands)	Year Ended December 31,	
	2013	2012
Net sales and revenues	\$ —	\$ 425
Gross margin	\$ —	\$ (296 )
Loss from discontinued operations before sale of business unit	\$ —	\$ (580 )
Gain on sale of business unit, net of transaction expenses	—	5,449
Income tax provision	—	(1,948 )
Net income from discontinued operations, net of tax	\$ —	\$ 2,921

19. Variable Interest Entity

The Company has interests in N2 Bio which is a variable interest entity (“VIE”). A VIE is an entity that lacks one or more of the following characteristics (i) the total equity investment at risk is sufficient to enable the entity to finance its activities independently and (ii) the equity holders have the power to direct the activities of the entity that most significantly impact its economic performance, the obligation to absorb the losses of the entity and the right to receive the residual returns of the entity.

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If the Company is the primary beneficiary of a VIE, the Company is required to consolidate it. To determine if the Company is the primary beneficiary, the Company evaluates whether the Company has the power to direct the activities that most significantly impact the VIE's economic performance and the obligation to absorb losses or the right to receive benefits of the VIE that could potentially be significant to the VIE. The Company's evaluation includes identification of significant activities and an assessment of the Company's ability to direct those activities based on governance provisions and arrangements to provide or receive product and process technology, product supply, operations services, equity funding, financing and other applicable agreements and circumstances. The Company's assessments of whether the Company is the primary beneficiary of its VIE require significant assumptions and judgments and are reviewed on an ongoing basis based on current facts and circumstances.

On September 18, 2013, the Company, Spire Biomedical, Inc. (the "Subsidiary" and together with the Company, "Spire Bio") entered into an Asset Purchase Agreement (the "Purchase Agreement") with N2 Biomedical LLC ("N2 Bio") pursuant to which N2 Bio agreed to (i) acquire substantially all of the assets of Spire Bio's biomedical business (the "Bio Business Unit") and (ii) assume and pay certain liabilities related to the purchased assets as set forth in the Purchase Agreement (collectively, the "Transaction"). The Transaction closed on September 18, 2013. The purchase price for the Bio Business Unit was \$10.5 million plus the assumption of liabilities of approximately \$100 thousand, with \$6.0 million paid in cash at closing, a \$2.4 million subordinated convertible promissory note, and 310,549 Series A Convertible Preferred Units of N2 Bio valued at approximately \$2.1 million (\$6.72 per share). The assets and liabilities of the Subsidiary's biomedical business are under common control and were recorded at carryover basis for financial reporting. The difference between the consideration paid and the carrying value of the assets and liabilities acquired by N2 Bio was recorded as a deemed dividend to the Company in the amount of \$9.5 million and has been eliminated in consolidation. Mark C. Little was the Chief Executive Officer of the Subsidiary, is a director of the Company and is the Chief Executive Officer of N2 Bio. Mark C. Little is the son of Roger G. Little, Chief Executive Officer of the Company. Roger G. Little is also a member of the Board of Directors of N2 Bio.

On September 18, 2013, N2 Bio entered into a Lease Agreement (the "N2 Bio Bedford Lease") with SPI-Trust with respect to 27 thousand square feet of space which represents approximately 19% of space in the Bedford, Massachusetts premises. The term of the N2 Bio Bedford Lease commenced on September 18, 2013 and is set to expire on November 30, 2020. The annual rental rate prorated for September 18, 2013 to November 30, 2013 is \$16.00 per square foot on a triple net basis, whereby the tenant is responsible for operating expenses, taxes and maintenance of the building. The annual rental rate increases on December 1, 2013 and each anniversary thereafter by \$0.50 per square foot.

The Company has determined that N2 Bio is a VIE because the equity investment at risk from the majority shareholders of N2 Bio is not sufficient to permit N2 Bio to finance its activities without additional subordinated financial support. As discussed above, N2 Bio is subject to a subordinated convertible promissory note due to the Company. Additionally, Mark Little is the Chief Executive Officer of N2 Bio and also a member the Company's Board of Directors. The Company has also determined that the Company has the obligation to absorb losses and the right to receive benefits from N2 Bio that could potentially be significant to it. Therefore, the Company has determined that N2 Bio is a VIE and that the Company is a primary beneficiary of the VIE and must consolidate the financial condition, results of operations and cash flows of N2 Bio with those of its own.

The assets and liabilities with carryover basis as noted above from the VIE included in the audited consolidated balance sheet as of December 31, 2013 are as follows:



(in thousands)	December 31, 2013
Assets of VIE	
Current Assets	
Cash and cash equivalents	\$ 131
Accounts receivable trade, net	899
Due from related parties	24
Inventories, net	22
Prepaid expenses and other current assets	114
Total current assets of VIE	1,190
Property and equipment, net	266
Intangible & other assets, net	85
Total assets of VIE	\$ 1,541
Liabilities of VIE	
Current liabilities	
Current portion of term loan	\$ 753
Revolving line of credit	438
Accounts payable	144
Accrued liabilities	169
Total current liabilities of VIE	1,504
Long-term portion of term loan	5,064
Long-term note payable to related party	2,400
Other long-term liabilities	12
Total liabilities of VIE	\$ 8,980

## 20. Subsequent Events

The Company evaluated subsequent events through the date of this filing and had no subsequent events to report.

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

None.

## Item 9A. Controls and Procedures

### Evaluation of Disclosure Controls and Procedures

As of the end of the period covered by this report, an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rule 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”)) was performed under the supervision and with the participation of management, including our Chief Executive Officer and Chief Financial Officer. Based on that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective as of December 31, 2013 to ensure that information required to be disclosed in the reports it files and submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC’s rules

and forms and that information required to be disclosed under the Exchange Act is accumulated and communicated to management, including our Chief Executive Officer and our Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

Management's Report on Internal Control over Financial Reporting

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Our Company's management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f) and 15d-15(f). Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our consolidated financial statements for external purposes in accordance with generally accepted accounting principles. Under the supervision and with the participation of our Company's management, including the Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2013 based on the framework in the 1992 Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Our internal control over financial reporting includes those policies and procedures that: (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of our consolidated financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our consolidated financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Based on our evaluation under the framework in the 1992 Internal Control—Integrated Framework, the management of our Company concluded that our internal control over financial reporting was effective as of December 31, 2013.

#### Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2013 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

#### Item 9B. Other Information

None

### PART III

#### Item 10. Directors, Executive Officers and Corporate Governance

Information concerning our directors, executive officers and corporate governance is set forth in the Proxy Statement for the Special Meeting in Lieu of 2014 Annual Meeting of Stockholders ("Proxy Statement") and is incorporated herein by reference. Information concerning compliance with Section 16(a) of the Exchange Act is set forth under "Compliance with Section 16(a) of the Securities Exchange Act of 1934" in the Proxy Statement and is incorporated herein by reference.

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We have adopted a Code of Business Conduct and Ethics (the "Code") that applies to our principal executive officer, principal financial officer and principal accounting officer or controller, as well as to directors, officers and employees generally. The Code sets forth written standards that are reasonably designed to deter wrongdoing and to promote (1) honest and ethical conduct, (2) full, fair, accurate, timely and understandable disclosure in reports and documents that we file with the SEC and in other public communications made by us, (3) compliance with applicable governmental laws, rules and regulations, (4) the prompt internal reporting of violations of the Code to an appropriate person or persons identified in the Code and (5) accountability for adherence to the Code. We will provide to any person without charge, upon request, a copy of the Code. Any person wishing a copy should write to Michael W. O'Dougherty, Clerk, Spire Corporation, One Patriots Park, Bedford, Massachusetts 01730-2396.

A copy of the Code is incorporated by reference as Exhibit 21 to our Form 10-KSB for the fiscal year ended December 31, 2003.

### Item 11. Executive Compensation

Information concerning executive compensation is set forth in the Proxy Statement and is incorporated herein by reference.



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

Information concerning security ownership of certain beneficial owners and management, and related stockholder matters, is set forth in the Proxy Statement and is incorporated herein by reference.

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

Information concerning certain relationships and related transactions, and director independence, is set forth in the Proxy Statement and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

Information concerning principal accounting fees and services is set forth in the Proxy Statement and incorporated herein by reference.

PART IV

Item 15. Exhibits

The following Exhibits are either filed herewith or are incorporated by reference as may be indicated.

- 2.1 Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.5 to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009. +
- 2.2 Extension dated September 25, 2009 of Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.6 to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009.
- 2.3 Extension dated October 30, 2009 of Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.7 to the Company's 2009 Form 10-Q for the quarter ended September 30, 2009.
- 2.4 Extension dated November 30, 2009 of Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.8 to the Company's Form 8-K filed with the SEC on December 18, 2009.
- 2.5 Amendment dated December 14, 2009 of Asset Purchase Agreement, dated September 4, 2009, by and among Bard Access Systems, Inc. and Spire Biomedical, Inc. and Spire Corporation, incorporated by reference to Exhibit 2.9 to the Company's Form 8-K filed with the SEC on December 18, 2009. +
- 2.6 Asset Purchase Agreement, dated March 9, 2012, by and among Masimo Corporation, Masimo Semiconductor, Inc., Spire Corporation and Spire Semiconductor, LLC, incorporated by reference to Exhibit 2.1 to the Company's Form 8-K filed with the SEC on March 12, 2012. +
- 2.7 Asset Purchase Agreement, dated September 18, 2013 by and among Spire Corporation, Spire Biomedical, Inc. and N2 Biomedical LLC., incorporated by reference to Exhibit 2.1 to the Company's Form 8-K filed with the SEC on September 24, 2013.
- 3.1 Articles of Organization as amended, incorporated by reference to Exhibit 3(a) to the Company's Form 10-QSB for the quarter ended June 30, 1997.
- 3.2 By-Laws, as amended, incorporated by reference to Exhibit 3(b) to the Company's Form 10-K for the year ended December 31, 1989 (SEC File No. 0-12742).
- 10.1 Employment Agreement with Roger G. Little dated as of January 1, 2002, incorporated by reference to Exhibit 10(e) to the Company's Form 10-KSB for the year ended December 31, 2001 (SEC File No. 0-12742).
- 10.2 Amendment No. One dated November 18, 2004 to Employment Agreement for Roger G. Little, incorporated by reference to Exhibit 10(m) to the Company's Form 10-KSB for the year ended December 31, 2004 ("2004 10-KSB"). (SEC File No. 0-12742).
- 10.3 Non-Qualified Deferred Compensation Plan for Roger Little (Amended and Restated Effective as of November 17, 2011), incorporated by reference to Exhibit 10.41 to the Company's Form 8-K filed with the SEC on November 22, 2011.
- 10.4 Spire Corporation 1996 Equity Incentive Plan, incorporated by reference to Appendix A to the Company's Proxy Statement dated April 15, 2004 (SEC File No. 0-12742).
- 10.5 Spire Corporation 2007 Stock Equity Plan, as amended, incorporated by reference to Appendix A to the Company's Schedule 14A Proxy Statement filed with the Securities and Exchange Commission on April 10, 2012.
- 10.6 Spire Corporation 401(k) Profit Sharing Plan, incorporated by reference to Exhibit 10(h) to the Company's Form 10-KSB for the year ended December 31, 2003 ("2003 10-KSB") (SEC File No. 0-12742).
- 10.7

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Trust Agreement dated April 1, 2004 between the Company and Riggs Bank N.A. as Trustee of the Company's 401(k) Profit Sharing Plan, incorporated by reference to Exhibit 10(l) to the Company's 2004 10-KSB (SEC File No. 0-12742).

10.8 Amendment Number Four to the Spire Corporation 401(k) Profit Sharing Plan dated November 21, 2005, incorporated by reference to Exhibit 10(p) to the Company's Form 10-KSB for the year ended December 31, 2005 (SEC File No. 0-12742).

10.9 Amendment Number Five to the Spire Corporation 401(k) Profit Sharing Plan dated December 22, 2006, incorporated by reference to Exhibit 10(u) to the Company's Form 10-KSB for the year ended December 31, 2006 (SEC File No. 0-12742).

10.10 Lease Agreement, dated September 1, 2008, between Roger G. Little, Trustee of SPI-Trust, and Spire Corporation, incorporated by reference to Exhibit 10(ae) to the Company's Form 8-K filed with the SEC on August 29, 2008 (SEC File No. 0-12742).

10.11 Lease Agreement, dated November 30, 2007, between Roger G. Little, Trustee of SPI-Trust, and Spire Corporation (lease of premises, approximately 144,230 sq. ft.), incorporated by reference to Exhibit 10(y) to the Company's Form 8-K filed with the SEC on December 6, 2007 (SEC File No. 0-12742).

- 10.12 First Amendment to Lease Agreement, dated September 17, 2010, between Roger G. Little, Trustee of SPI-Trust, and Spire Corporation (lease of premises, approximately 144,230 sq. ft.), incorporated by reference to Exhibit 10(ay) to the Company's Form 8-K filed with the SEC on September 22, 2010.
- 10.13 Second Amendment to Lease Agreement, dated September 18, 2013, between Roger G. Little, Trustee of SPI-Trust, and Spire Corporation (lease of premises, approximately 117,182 sq. ft.), incorporated by reference to Exhibit 10.5 to the Company's 2013 Form 10-Q for the quarter ended September 30, 2013. +
- 10.14 Second Amended and Restated Loan and Security Agreement, dated November 16, 2009, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(au) to the Company's 2010 Form 10-Q for the quarter ended March 31, 2010.
- 10.15 Amended and Restated Export-Import Bank Loan and Security Agreement, dated November 16, 2009, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(av) to the Company's 2010 Form 10-Q for the quarter ended March 31, 2010.
- 10.16 First Loan Modification Agreement (Domestic), dated June 15, 2010, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(aw) to the Company's 2010 Form 10-Q for the quarter ended June 30, 2010.
- 10.17 First Loan Modification Agreement (Exim), dated June 15, 2010, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10(ax) to the Company's 2010 Form 10-Q for the quarter ended June 30, 2010.
- 10.18 Second Loan Modification Agreement (Domestic), dated November 8, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.20 to the Company's 2011 Form 10-K for the year ended December 31, 2011.
- 10.19 Second Loan Modification Agreement (Exim), dated November 8, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.21 to the Company's 2011 Form 10-K for the year ended December 31, 2011.
- 10.20 Third Loan Modification Agreement (Domestic), dated December 30, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.22 to the Company's 2011 Form 10-K for the year ended December 31, 2011.
- 10.21 Third Loan Modification Agreement (Exim), dated December 30, 2011, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.23 to the Company's 2011 Form 10-K for the year ended December 31, 2011.
- 10.22 Fourth Loan Modification Agreement (Domestic), dated December 20, 2012, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.21 to the Company's 2012 Form 10-K for the year ended December 31, 2012.
- 10.23 Fourth Loan Modification Agreement (Exim), dated December 20, 2012, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.22 to the Company's 2012 Form 10-K for the year ended December 31, 2012.
- 10.24 Fifth Loan Modification Agreement (Domestic), dated June 12, 2013, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.1 to the Company's 2013 Form 10-Q for the quarter ended June 30, 2013.
- 10.25 Fifth Loan Modification Agreement (Exim), dated June 12, 2013, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.2 to the Company's 2013 Form 10-Q for the quarter ended June 30, 2013.
- 10.26 Sixth Loan Modification Agreement (Domestic), dated September 3, 2013, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.1 to the Company's 2013 Form 10-Q for the quarter ended September 30, 2013.

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- 10.27 Sixth Loan Modification Agreement (Exim), dated September 3, 2013, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.2 to the Company's 2013 Form 10-Q for the quarter ended September 30, 2013.
- 10.28 Seventh Loan Modification Agreement (Domestic), dated November 18, 2013, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.6 to the Company's 2013 Form 10-Q for the quarter ended September 30, 2013.
- 10.29 Seventh Loan Modification Agreement (Exim), dated November 18, 2013, among Spire Corporation, Spire Solar, Inc., Spire Biomedical, Inc., Spire Semiconductor, LLC and Silicon Valley Bank, incorporated by reference to Exhibit 10.7 to the Company's 2013 Form 10-Q for the quarter ended September 30, 2013.
- 10.30 N2 Biomedical LLC Amended and Restated Limited Liability Company Agreement, dated September 18, 2013, incorporated by reference to Exhibit 10.3 to the Company's 2013 Form 10-Q for the quarter ended September 30, 2013. +
- 10.31 Shared Services Agreement, dated September 18, 2013, among Spire Corporation and N2 Biomedical LLC, incorporated by reference to Exhibit 10.4 to the Company's 2013 Form 10-Q for the quarter ended September 30, 2013. +
- 14 Code of Business Conduct and Ethics incorporated by reference to Exhibit 14 to the 2003 10-KSB.

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- 21 Subsidiaries of the Registrant, incorporated by reference to Exhibit 21 to the 2003 10-KSB.
- 23.1 Consent of Independent Registered Public Accounting Firm (filed herewith).
- 31.1 Certification of the Chief Executive Officer and President pursuant to §302 of the Sarbanes-Oxley Act of 2002 (filed herewith).
- 31.2 Certification of the Chief Financial Officer pursuant to §302 of the Sarbanes-Oxley Act of 2002 (filed herewith).
- 32.1 Certification of the Chief Executive Officer and President pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002 (filed herewith).
- 32.2 Certification of the Chief Financial Officer pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002 (filed herewith).
- 101.INS XBRL Instance Document
- 101.SCH XBRL Taxonomy Extension Schema Document
- 101.CAL XBRL Taxonomy Extension Calculation Linkbase Document
- 101.DEF XBRL Taxonomy Extension Definition Linkbase Document
- 101.LAB XBRL Taxonomy Extension Lable Linkbase Document
- 101.PRE XBRL Taxonomy Extension Presentation Linkbase Document

\* Portions of this Exhibit have been omitted pursuant to a grant of confidential treatment.

+ We agree to furnish supplementally to the SEC a copy of any omitted schedule or exhibit to this agreement upon request by the SEC.

SIGNATURES

In accordance with Section 13 or 15(d) of the Exchange Act, the registrant caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

SPIRE CORPORATION

Date: March 31, 2014

By: /s/ Rodger W. LaFavre  
 Rodger W. LaFavre  
 Chief Executive Officer and President

In accordance with the Exchange Act, 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/ Rodger W. LaFavre Rodger W. LaFavre	Chief Executive Officer and President (Principal Executive Officer)	March 31, 2014
/s/ Robert S. Lieberman Robert S. Lieberman	Chief Financial Officer and Treasurer (Principal Financial Officer and Principal Accounting Officer)	March 31, 2014
/s/ Roger G. Little Roger G. Little	Chairman of the Board	March 31, 2014
/s/ Udo Henseler Udo Henseler	Director	March 31, 2014
/s/ David R. Lipinski David R. Lipinski	Director	March 31, 2014
/s/ Mark C. Little Mark C. Little	Director	March 31, 2014
/s/ Michael J. Magliochetti Michael J. Magliochetti	Director	March 31, 2014
/s/ Roger W. Redmond Roger W. Redmond	Director	March 31, 2014

EXHIBIT INDEX

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