

SPIRE Corp  
Form 10-Q  
May 15, 2014

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

FORM 10-Q

Quarterly Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934  
For the quarterly period ended March 31, 2014; 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  
(Address of principal executive offices)

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

01730-2396  
(Zip Code)

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

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 (§232.405 of this chapter) 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 whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See definition of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer  Accelerated filer  Non-accelerated filer  Smaller reporting company

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(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

The number of shares of the registrant's common stock outstanding as of May 12, 2014 was 9,207,874.

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## TABLE OF CONTENTS

	Page
PART I. Financial Information	
Item 1. <u>Unaudited Condensed Consolidated Financial Statements:</u>	
<u>Unaudited Condensed Consolidated Balance Sheets as of March 31, 2014 and December 31, 2013</u>	1
<u>Unaudited Condensed Consolidated Statements of Operations for the Three Months Ended March 31, 2014 and 2013</u>	2
<u>Unaudited Condensed Consolidated Statements of Comprehensive Loss for the Three Months Ended March 31, 2014 and 2013</u>	3
<u>Unaudited Condensed Consolidated Statements of Cash Flows for the Three Months Ended March 31, 2014 and 2013</u>	4
<u>Notes to Unaudited Condensed Consolidated Financial Statements</u>	5
Item 2. <u>Management’s Discussion and Analysis of Financial Condition and Results of Operations</u>	18
Item 3. <u>Quantitative and Qualitative Disclosures About Market Risk</u>	25
Item 4. <u>Controls and Procedures</u>	25
PART II. Other Information	
Item 1. <u>Legal Proceedings</u>	25
Item 1A. <u>Risk Factors</u>	26
Item 2. <u>Unregistered Sales of Equity Securities and Use of Proceeds</u>	26
Item 3. <u>Defaults Upon Senior Securities</u>	26
Item 4. <u>Mine Safety Disclosures</u>	26
Item 5. <u>Other Information</u>	26
Item 6. <u>Exhibits</u>	27
<u>Signatures</u>	28
<u>Exhibit Index</u>	29

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## PART I. FINANCIAL INFORMATION

## Item 1. Unaudited Condensed Consolidated Financial Statements

## SPIRE CORPORATION AND SUBSIDIARIES

## UNAUDITED CONDENSED CONSOLIDATED BALANCE SHEETS

(in thousands, except share amounts)

	March 31, 2014	December 31, 2013
Assets		
Current assets		
Cash and cash equivalents	\$2,389	\$3,986
Restricted cash	666	170
Available-for-sale investments, at quoted market value (cost of \$2,276 and \$3,142 at March 31, 2014 and December 31, 2013, respectively)	3,041	3,535
Accounts receivable – trade, net	1,767	1,414
Inventories, net	3,903	3,816
Deferred cost of goods sold	136	849
Prepaid expenses and other current assets	499	926
Total current assets	12,401	14,696
Property and equipment, net	903	941
Intangible and other assets, net	421	432
Total assets	\$13,725	\$16,069
Liabilities and Stockholders' Deficit		
Current liabilities		
Current portion of capital lease obligation	\$5	\$8
Revolving lines of credit	479	583
Current portion of term loan	762	753
Accounts payable	3,033	2,323
Accrued liabilities	2,127	2,336
Advances on contracts in progress	1,525	1,433
Deferred compensation	3,041	3,535
Liabilities of discontinued operations	21	21
Total current liabilities	10,993	10,992
Long-term portion of term loan	4,870	5,064
Other long-term liabilities	899	726
Total long-term liabilities	5,769	5,790
Total liabilities	16,762	16,782
Stockholders' deficit		
Common stock, \$0.01 par value; 20,000,000 shares authorized; 9,207,874 shares issued and outstanding on March 31, 2014 and December 31, 2013	93	93
Additional paid-in capital	23,275	23,267
Accumulated deficit	(27,544)	(24,422)
Accumulated other comprehensive income	765	393
Total Spire Corporation stockholders' deficit	(3,411)	(669)
Noncontrolling interest	374	(44)
Total stockholders' deficit	(3,037)	(713)
Total liabilities and stockholders' deficit	\$13,725	\$16,069

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

- 1-

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

	Three Months Ended March 31,	
	2014	2013
Net sales and revenues		
Sales of goods	\$1,189	\$970
Contract research and service revenues	2,897	2,268
Total net sales and revenues	4,086	3,238
Cost of sales and revenues		
Cost of goods sold	1,753	1,791
Cost of contract research and services	1,844	1,222
Total cost of sales and revenues	3,597	3,013
Gross margin	489	225
Operating expenses		
Selling, general and administrative expenses	3,096	2,814
Internal research and development expenses	22	13
Total operating expenses	3,118	2,827
Loss from operations	(2,629	) (2,602
Interest expense, net	(75	) (16
Foreign exchange loss	—	(8
Total other expense, net	(75	) (24
Loss from operations before income tax provision	(2,704	) (2,626
Income tax provision	—	(2
Net loss	(2,704	) (2,628
Less: Net income attributable to noncontrolling interest	418	—
Net loss attributable to common stockholders	\$(3,122	) \$(2,628
Basic and diluted loss per share	\$(0.34	) \$(0.29
Weighted average number of common and common equivalent shares outstanding – basic and diluted	9,207,874	9,080,385

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

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

	Three Months Ended March	
	31,	
	2014	2013
Comprehensive loss:		
Net loss	(2,704	) (2,628
Other comprehensive income:		
Change in fair value of available for sale marketable securities, net of tax	372	239
Total comprehensive loss	(2,332	) (2,389
Less: Comprehensive income attributable to noncontrolling interests	418	—
Comprehensive loss attributable to common stockholders	\$(2,750	) \$(2,389

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

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

	Three Months Ended March 31,	
	2014	2013
Cash flows from operating activities:		
Net loss	\$(2,704	) \$(2,628
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	137	119
Deferred compensation	372	239
Share-based compensation	8	36
Provision for accounts receivable reserve	32	—
Provision for inventory reserve	50	156
Changes in assets and liabilities:		
Restricted cash	(496	) —
Accounts receivable	(385	) 637
Inventories	(137	) (2
Deferred cost of goods sold	713	54
Deposits, prepaid expenses and other current assets	427	161
Accounts payable, accrued liabilities and other liabilities	674	538
Advances on contracts in progress	92	(100
Net cash used in operating activities	(1,217	) (790
Cash flows from investing activities:		
Purchase of property and equipment	(67	) (53
Additions to intangible and other assets	(21	) (22
Net cash used in investing activities	(88	) (75
Cash flows from financing activities:		
Principal payments on capital lease obligations	(3	) (3
Principal payments on term loan	(185	) —
Net payments on revolving lines of credit	(104	) —
Net cash used in financing activities	(292	) (3
Net decrease in cash and cash equivalents	(1,597	) (868
Cash and cash equivalents, beginning of period	3,986	3,030
Cash and cash equivalents, end of period	\$2,389	\$2,162
Supplemental disclosures of cash flow information:		
Interest paid	\$75	\$16
Income taxes paid	\$5	\$1
Supplemental disclosures of non-cash flow information:		
Liabilities settled with common stock	\$—	\$84

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

SPIRE CORPORATION AND SUBSIDIARIES  
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

March 31, 2014 and 2013

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 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. 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.

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 36% and 30% of net sales and revenues for the three months ended March 31, 2014 and 2013, respectively, continue to constitute a significant portion of the Company's net sales and revenues.

The Company has incurred losses from operations. Losses from operations was \$2.6 million and \$2.6 million for the three months ended March 31, 2014 and 2013, respectively. Net cash used in operating activities was \$1.2 million and \$790 thousand for the three months ended March 31, 2014 and 2013, respectively. As of March 31, 2014, the Company had unrestricted cash and cash equivalents of \$2.4 million compared to \$4.0 million as of December 31, 2013. The Company's credit facilities with Silicon Valley Bank expired on April 30, 2014 and will not be renewed and the Company has repaid the outstanding amounts as of this date. The maturity date of N2 Bio's revolving credit facility with Middlesex Savings Bank is May 31, 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 March 31, 2014, 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, private lenders, 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 or alternative financing, 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 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 markets or to replace its expired credit facilities, could adversely impact the Company's ability to continue as a going concern.

The financial statements do not include any adjustments that might be necessary if the Company is unable to continue as a going concern.

## 2. Interim Financial Statements

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with the rules and regulations of the Securities and Exchange Commission ("SEC") regarding interim financial reporting. Certain information and footnote disclosures normally included in consolidated financial statements prepared in accordance with accounting principles

- 5-

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generally accepted in the United States of America have been condensed or omitted in accordance with such rules and regulations. These unaudited condensed consolidated financial statements should be read in conjunction with the annual audited consolidated financial statements and notes thereto for the year ended December 31, 2013, included in the Company's Annual Report on Form 10-K filed with the SEC.

In the opinion of management, the accompanying unaudited condensed consolidated financial statements contain all adjustments (consisting of normal recurring adjustments) necessary to fairly present the Company's financial position as of March 31, 2014 and December 31, 2013 and the results of their operations for the three months ended March 31, 2014 and 2013. The results of operations for the three months ended March 31, 2014 are not necessarily indicative of the results to be expected for the fiscal year ending December 31, 2014. The unaudited condensed consolidated balance sheet as of December 31, 2013 has been derived from audited financial statements as of that date.

#### Summary of Significant Accounting Policies

With the exception of the Company's revenue recognition policy which has been updated below, the significant accounting policies followed by the Company are set forth in Note 2 to the Company's consolidated financial statements in its Annual Report on Form 10-K for the year ended December 31, 2013, filed with the SEC.

#### 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; (2) biomedical and coating technology 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 biomedical services provides advanced medical device surface treatment processes for performance improvement of orthopedic devices. The Company's coating technology services are provided to both industrial and consumer electronic applications. 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.

- 6-

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## New 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. The application of this ASU did not have an impact on the Company's unaudited condensed 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:

(in thousands)	March 31, 2014	December 31, 2013
Amounts billed	\$1,781	\$1,396
Accrued revenue	18	18
Gross accounts receivable - trade	1,799	1,414
Less: Allowance for doubtful accounts	(32	) —
Net accounts receivable - trade	\$1,767	\$1,414
Advances on contracts in progress	\$1,525	\$1,433

Accrued revenue represents revenues recognized on contracts for which billings have not been presented to customers as of the balance sheet date.

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 collection 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.

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 Costs of Goods Sold

Inventories, net of \$1.1 million and \$1.0 million of reserves at March 31, 2014 and December 31, 2013, respectively, and deferred cost of goods sold consist of the following at:

(in thousands)	March 31, 2014	December 31, 2013
Raw materials	\$1,157	\$1,310
Work in process	2,227	2,004
Finished goods	519	502
Net inventory	\$3,903	\$3,816

Deferred cost of goods sold	\$ 136	\$ 849
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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. Loss Per Share

- 7-

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

	Three Months Ended March 31,	
	2014	2013
Weighted average number of common and common equivalent shares outstanding – basic and diluted	9,207,874	9,080,385

For the three months ended March 31, 2014 and 2013, 20,811 and 4,610 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 three months ended March 31, 2014 and 2013, 522,246 and 642,446 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 net loss position and their exercise prices exceeding the average market price of the stock for the period.

## 6. Operating Segments and Related Information

The Company's operations are focused on two primary business areas: Spire Solar (comprised of solar equipment 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 14 to the unaudited condensed consolidated financial statements.

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

(in thousands)	Solar	Biomedical	Consolidated
For the three months ended March 31, 2014			
Net sales and revenues	\$2,243	\$1,843	\$4,086
Income (loss) from operations	\$(3,186)	) \$557	\$(2,629)
For the three months ended March 31, 2013			
Net sales and revenues	\$1,446	\$1,792	\$3,238
Income (loss) from operations	\$(2,792)	) \$190	\$(2,602)

Income (loss) from operations is net sales and revenues less cost of sales, selling, general and administrative expenses and internal research and development, but is not affected by non-operating income (expense) or by income taxes. In calculating income (loss) from 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):



(in thousands)	Three Months Ended March 31,					
	2014	%		2013	%	
United States	\$2,610	64	%	\$2,273	70	%
Asia	728	18		609	19	
Europe/Africa	567	14		336	10	
Rest of the world	181	4		20	1	
	\$4,086	100	%	\$3,238	100	%

Revenues from contracts with United States government agencies for the three months ended March 31, 2014 and 2013 were approximately \$1 thousand and \$0.4 million or 0.02% and 14% of total net sales and revenues, respectively.

Revenues from the delivery of biomedical services to two customers accounted for 18% and 18% of total net sales and revenues for the three month period ended March 31, 2014. Revenues from the delivery of equipment research and development to one customer and solar equipment to one customer accounted for 26% and 12%, respectively, of total net sales and revenues for the three month period ended March 31, 2014.

Revenues from the delivery of biomedical services to two customers accounted for 23% and 16% of total net sales and revenues for the three month period ended March 31, 2013.

Three customers represented approximately 26%, 33% and 12%, respectively, of net accounts receivable, trade at March 31, 2014 and two customers represented approximately 36% and 17% of net accounts receivable, trade at December 31, 2013.

## 7. Intangible and Other Assets

Patents amounted to \$57 thousand and \$62 thousand, net of accumulated amortization of \$884 thousand and \$871 thousand, at March 31, 2014 and December 31, 2013, respectively. Licenses amounted to \$91 thousand and \$110 thousand, net of accumulated amortization of \$57 thousand and \$38 thousand, at March 31, 2014 and December 31, 2013, respectively. Patent cost is primarily composed of costs 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, relating to patents and licenses, was approximately \$32 thousand and \$13 thousand for the three months ended March 31, 2014 and 2013, respectively.

For disclosure purposes, 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 March 31, 2014 of \$123 thousand. This estimated expense for 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 remaining 9 months	\$94
2015	49
2016	36
2017	32
2018	31
2019	6
2020 and future	23

\$271

Also included in other assets are refundable deposits made by the Company of approximately \$150 thousand and \$150 thousand at March 31, 2014 and December 31, 2013, respectively.

#### 8. 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 \$765

- 9-

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thousand and \$393 thousand as of March 31, 2014 and December 31, 2013, respectively. The participant of the deferred compensation plan received a partial deferred compensation payment of approximately \$1.2 million in January 2014 which was funded by the sale of these securities.

#### 9. 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 the three months ended March 31, 2014, none of the Company's instruments were reclassified between Level 1, Level 2, 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 investment carried at fair value on a recurring basis as of March 31, 2014 and December 31, 2013 by ASC 820-10 valuation hierarchy (as defined above).

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(in thousands)	Balance as of March 31, 2014	Level 1	Level 2	Level 3
Cash and short term investments	\$49	\$49	\$—	\$—
Common stock				
Basic Materials	14	14	—	—
Consumer Goods	184	184	—	—
Energy	62	62	—	—
Financial	116	116	—	—
Healthcare	120	120	—	—
Industrial Goods	83	83	—	—
Services	12	12	—	—
Technology	969	969	—	—
Transportation	—	—	—	—
Utilities	11	11	—	—
Total Common Stock	1,571	1,571	—	—
Mutual Fund				
Diversified Emerging Markets	228	—	228	—
Foreign Large Blend	212	—	212	—
Foreign Large Growth	213	—	213	—
Large Growth	183	—	183	—
Small Blend	220	220	—	—
Global High Yield Income Fund	42	—	42	—
Total Mutual Fund	1,098	220	878	—
Fixed Income				
Domestic	254	—	254	—
International	69	—	69	—
Total Fixed Income	323	—	323	—
Total available-for-sale investments <sup>(1)</sup>	\$3,041	\$1,840	\$1,201	\$—
Percent of total	100	% 61	% 39	% —

- 11-

(in thousands)	Balance as 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 Total	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	% —

(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 unaudited condensed consolidated balance sheets.

The carrying amounts reflected in the Company's unaudited condensed consolidated balance sheets for cash, accounts receivable - trade, prepaid expenses and other current assets, accounts payable, accrued liabilities, and capital lease obligations approximate fair value due to their short-term nature and the Company valuation techniques use Level 3 inputs. The fair value of the Company's term loan and revolving lines of credit have 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 approximate fair value at March 31, 2014 and December 31, 2013 and the Company's valuation techniques use Level 3 inputs.

#### 10. Notes Payable and Credit Arrangements

Prior to their expiration on April 30, 2014, the Company had 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

- 12-

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to which outstanding amounts under this facility were guaranteed by the Export-Import Bank of the United States (the "EXIM Bank"). The credit facilities provided an aggregate amount of \$1.5 million under both facilities, with up to \$1.0 million under the Revolving Credit Facility and up to \$1.5 million under the Ex-Im Facility. Under the credit facilities, interest on outstanding borrowings accrued at a rate per annum equal to the greater of (i) the prime rate plus 2.5% or (ii) 7.0%. As of March 31, 2014, the Company did not meet the compliance guidelines under the credit facilities, however the entire amount under the credit facilities were repaid by April 30, 2014.

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 May 31, 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 Revolving Credit Facility were \$23 thousand and \$107 thousand at March 31, 2014 and December 31, 2013, respectively. Advances outstanding under the Ex-Im Facility were \$118 thousand and \$38 thousand at March 31, 2014 and December 31, 2013, respectively. Advances outstanding under the N2 Bio Secured Term Loan were \$5.6 million and \$5.8 million at March 31, 2014 and December 31, 2013, respectively. Advances outstanding under the N2 Bio Secured Revolving Demand Note were \$338 thousand and \$438 thousand at March 31, 2014 and December 31, 2013, respectively. As of March 31, 2014, the interest rate per annum on the Revolving Credit Facility and Ex-Im Facility was 6.5% and 6.5%, respectively. The interest rate per annum on the N2 Bio Secured Term Loan and Secured Revolving Demand Note on March 31, 2014 was 4.5% and 3.75%, respectively. Combined availability under the Revolving Credit Facility, the Ex-Im Facility and the Secured Revolving Demand Note was \$595 thousand as of March 31, 2014.

The Company has outstanding letters of credit to secure performance obligations and purchase commitments. Holders of the letters of credit are allowed 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 are secured by restricted cash. Outstanding letters of credit totaled \$666 thousand and \$170 thousand at March 31, 2014 and December 31, 2013, respectively.

## 11. Share-Based Compensation

The Company has recognized share-based compensation expense of approximately \$8 thousand and \$36 thousand for the three months ended March 31, 2014 and 2013, respectively. The total non-cash, share-based compensation expense included in the unaudited condensed consolidated statements of operations for the periods presented is

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included in the following expense categories:

(in thousands)	Three Months Ended March 31,	
	2014	2013
Cost of contract research, services	\$—	\$5
Cost of goods sold	—	3
Administrative and selling	8	28
Total share-based compensation	\$8	\$36

- 13-

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No share-based compensation expense was capitalized during the three months ended March 31, 2014 and 2013. Compensation expense related to stock options to be charged in future periods amounts to approximately \$10 thousand at March 31, 2014 and will be recognized over a weighted-average period of 0.35 years as follows:

For the years ended December 31,	Expected Compensation Expense (in thousands)
2014	\$10
	\$10

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 March 31, 2014, the Company had outstanding options under two 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 March 31, 2014 and changes during the three-month period ended March 31, 2014 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, 2013	527,246	\$ 5.88		
Granted	—	\$ —		
Exercised	—	\$ —		
Cancelled/expired	(5,000 )	\$ 6.24		
Options outstanding at March 31, 2014	522,246	\$ 5.87	4.95	\$30
Options vested and exercisable at March 31, 2014	509,746	\$ 5.91	4.91	\$30
Option vested and expected to vest at March 31, 2014	521,802	\$ 5.90	4.91	\$—
Options available for future grant at March 31, 2014	483,759			

The aggregate intrinsic value in the table above represents the total intrinsic value, based on the Company's closing stock price of \$1.03 as of March 31, 2014, 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 three months ended March 31, 2014 and 2013, respectively. The total intrinsic value of options expected to vest at March 31, 2014 was approximately zero, and the weighted average remaining contractual life of outstanding options that are expected to vest is 4.9 years.

12. Accumulated Other Comprehensive Income

Changes in accumulated other comprehensive income balances by component for the three months ended March 31, 2014 consist of the following:

- 14-

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(in thousands)	Unrealized Gains (Losses) on Available for Sale Securities
Balance, December 31, 2013	\$ 393
Other comprehensive income before reclassification	431
Amounts reclassified from accumulated other comprehensive income	(59 )
Net current-period other comprehensive income	372
Balance, March 31, 2014	\$ 765

Reporting reclassifications out of accumulated other comprehensive income for the three months ended March 31, 2014 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 (losses) on available-for-sale investments	\$ (59 )	Selling, general and administrative expenses

### 13. 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. 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.

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.

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. The assets of N2 Bio can only be used to settle the obligations of N2 Bio and there is no recourse to the Company related to the third party obligations of or third party arrangements entered into by N2 Bio. 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 from the VIE included in the condensed consolidated balance sheets as of March 31, 2014 and December 31, 2013 are as follows:

(in thousands)	March 31, 2014	December 31, 2013
Assets of VIE		
Current Assets		
Cash and cash equivalents	\$ 72	\$ 131
Accounts receivable trade, net	1,123	899
Due from related parties	1	24
Inventories, net	50	22
Prepaid expenses and other current assets	88	114
Total current assets of VIE	1,334	1,190
Property and equipment, net	281	266
Intangible & other assets, net	81	85
Total assets of VIE	\$ 1,696	\$ 1,541
Liabilities of VIE		
Current liabilities		
Revolving line of credit	\$ 338	\$ 438
Current portion of term loan	762	753
Accounts payable	68	144
Accrued liabilities	155	169
Total current liabilities of VIE	1,323	1,504
Long-term portion of term loan	4,870	5,064
Long-term note payable to related party	2,400	2,400
Other long-term liabilities	22	12
Total liabilities of VIE	\$ 8,615	\$ 8,980

#### 14. Subsequent Events

The Company evaluated subsequent events through the date of this filing. Except for the following, there are no additional subsequent events to report:

- 16-

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On February 4, 2011, Silicon International Ltd. ("SI") filed a complaint against the Company in Suffolk Superior Court in Massachusetts, alleging breaches of contract related to SI's activities acting as a former sales and service representative in China. The complaint made claims regarding amounts allegedly owed to SI by the Company. In April 2014, the Company and SI reached a settlement whereby they agreed to the action with prejudice, and the Company agreed to pay a sum with a net present value of \$358 thousand. Payments will be made in installments through October 15, 2018.

On April 30, 2014, the Company's credit facilities with Silicon Valley Bank expired.

- 17-

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## Item 2. 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. 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 discussed or referred to in the Annual Report on Form 10-K for the year ended December 31, 2013 and in subsequent period reports filed with the Securities and Exchange Commission, including this report. 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 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. 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.

## Results of Operations

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. Export sales, which amounted to 36% and 30% of net sales and revenues for the three months ended March 31, 2014 and 2013, respectively, continue to constitute a significant portion of the Company's net sales and revenues.

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

	Three Months Ended March 31,			
	2014		2013	
Net sales and revenues	100	%	100	%
Cost of sales and revenues	(88	)	(93	)
Gross margin	12		7	
Selling, general and administrative expenses	(76	)	(87	)
Internal research and development expenses	—		—	
Operating loss from continuing operations	(64	)	(80	)
Other expense, net	(2	)	(1	)
Loss from operations before income tax provision	(66	)	(81	)
Income tax provision	—		—	
Net loss	(66	)	(81	)
Less: Net income attributable to noncontrolling interest	10		—	
Net loss attributable to common stockholders	(76	)%	(81	)%

## Overall

Our total net sales and revenues for the three months ended March 31, 2014 were \$4.1 million as compared to \$3.2 million for the three months ended March 31, 2013, which represents an increase of \$848 thousand or 26%. The increase was primarily attributable to a \$798 thousand increase in solar revenue along with a slight increase in biomedical revenue.

## Solar Business Unit

Sales in our solar business unit increased 55% during the three months ended March 31, 2014 to \$2.2 million as compared to \$1.4 million for the three months ended March 31, 2013. The increase in solar business unit revenue is primarily the result of an increase in equipment research and development revenue of \$858 thousand and an increase in solar module equipment revenue of \$235 thousand, partially offset by a decrease in solar research and development revenue of \$280 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 via the growing photovoltaic systems market. Our Solar Business Unit has been negatively impacted by this reduction in demand.

## Biomedical Business Unit

Revenues from the biomedical business increased 3% during the three months ended March 31, 2014 to \$1.8 million as compared to \$1.8 million for the three months ended March 31, 2013. The increase was primarily attributable to an increase in revenue from the orthopedics coating services, partially offset by a decrease in revenue from our research and development contracts.

Three Months Ended March 31, 2014 Compared to Three Months Ended March 31, 2013

Net Sales and Revenues

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

- 19-

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(in thousands)	Three Months Ended March 31,		Increase		
	2014	2013	\$	%	
Sales of goods	\$1,189	\$970	\$219	23	%
Contract research and services revenues	2,897	2,268	629	28	%
Net sales and revenues	\$4,086	\$3,238	\$848	26	%

The 23% increase in sales of goods for the three months ended March 31, 2014 as compared to the three months ended March 31, 2013 was primarily due to an increase of \$235 thousand in solar module manufacturing equipment, partially offset by a decrease of \$12 thousand in ATC Lab revenues. The increase in solar module equipment sales of 25% in 2014 as compared to 2013 was primarily due to an increase in module equipment parts and upgrades delivered in 2014. The decrease in ATC lab revenue of 50% in 2014 as compared to 2013 was primarily due to a reduction in the number of projects completed in 2014. 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 via the growing photovoltaic systems market. Our Solar Business Unit has been negatively impacted by this reduction in demand.

The 28% increase in contract research and services revenues for the three months ended March 31, 2014 as compared to the three months ended March 31, 2013 is primarily attributable to an increase of \$858 thousand in equipment research and development revenue and an increase of \$76 thousand in biomedical service revenue, partially offset by a decrease of \$279 thousand in solar research and development revenue and a decrease of \$26 thousand in biomedical research and development revenue. The increase in equipment research and development revenue of 438% in 2014 as compared to 2013 was primarily due to the completion of a large project in 2014. Revenues from our biomedical services increased 4% in 2014 compared to 2013 as a result of an increase in revenue from a large customer in 2014. The decrease in solar research and development revenue of 100% in 2014 as compared to 2013 was primarily due to the completion of two research and development projects in 2013. The decrease in biomedical research and development revenue of 100% in 2014 as compared to 2013 was primarily due to the completion of five research and development projects in 2013.

#### 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)	Three Months Ended March 31,				Increase (Decrease)		
	2014	%	2013	%	\$	%	%
Cost of goods sold	\$1,753	147	\$1,791	185	\$(38)	(2)	)%
Cost of contract research and services	1,844	64	1,222	54	622	51	%
Net cost of sales and revenues	\$3,597	88	\$3,013	93	\$584	19	%

Cost of goods sold decreased 2% for the three months ended March 31, 2014 as compared to the three months ended March 31, 2013, primarily due to a decrease of \$26 thousand in costs related to solar systems and a decrease of \$25 thousand in costs related to the ATC lab, partially offset by slight increase in costs related to solar module equipment. The decrease in solar system costs of 100% in 2014 as compared to 2013 was primarily due to no active projects in 2014. The decrease in ATC lab costs of 40% in 2014 as compared to 2013 was primarily due to a decrease in associated revenue. The slight increase in solar module equipment costs in 2014 as compared to 2013 was primarily due to an increase in associated revenue. As a percentage of sales, cost of goods sold decreased to 147% of sales of goods in 2014 as compared to 185% of sales of goods in 2013. This decrease in the percentage of sales in 2014 is due primarily the delivery of higher margin module equipment parts and upgrades in 2014.

Cost of contract research and services increased 51% for the three months ended March 31, 2014 as compared to the three months ended March 31, 2013, primarily due to an increase of \$899 thousand in costs related to equipment research and development services, partially offset by a decrease of \$124 thousand in costs related to solar research and development services and \$108 thousand in costs related to biomedical research and development services. The increase in equipment research and development services costs in 2014 was primarily due to the completion of a large project in 2014. The decrease in solar research and development services costs of 84% in 2014 as compared to 2013 was primarily due to no active projects being worked on in 2014. The decrease in biomedical research and development services costs of 100% in 2014 as compared to 2013 was primarily due to no active projects being worked on in 2014. Cost of contract research and services as a percentage of related revenue increased to 64% of related revenues in 2014 from 54% in 2013. This increase in the percentage of sales in 2014 is primarily due to lower margin from the completion of a large equipment research and development project in the first quarter of 2014.

- 20-

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Cost of sales and revenues also includes approximately zero and \$8 thousand of share-based compensation for the three months ended March 31, 2014 and 2013, respectively.

### Operating Expenses

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

(in thousands)	Three Months Ended March 31,				Increase			
	2014	%	2013	%	\$	%		
Selling, general and administrative	\$3,096	76	% \$2,814	87	% \$282	10	%	
Internal research and development	22	1	% 13	—	% 9	69	%	
Operating expenses	\$3,118	76	% \$2,827	87	% \$291	10	%	

### Selling, General and Administrative Expenses

Selling, general and administrative expense increased 10% in the three months ended March 31, 2014 as compared to the three months ended March 31, 2013, primarily as a result of an increase in legal costs, related to a settlement in a dispute (see Part II, Item 1, Legal Proceedings), partially offset by a decrease in employee related expenses due to a reduction in workforce. In addition, an expense of approximately \$372 thousand was realized related to the change in value of the deferred compensation plan. Selling, general and administrative expense decreased to 76% of sales and revenues in 2014 as compared to 87% in 2013. The decrease was primarily due to the increase in sales and revenues.

Selling, general and administrative expenses include approximately \$8 thousand and \$28 thousand of share-based compensation for the three months ended March 31, 2014 and 2013, respectively.

### Internal Research and Development

Internal research and development expense increased 69% in the three months ended March 31, 2014 as compared to the three months ended March 31, 2013, primarily as a result of slightly higher levels of research and development spent in the solar group. As a percentage of sales and revenue, internal research and development expenses increased slightly in 2014 when compared to 2013.

### Other Expense, Net

We incurred interest expense of \$75 thousand and \$16 thousand for the three months ended March 31, 2014 and 2013, 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. We had nominal currency exchange losses during the three months ended March 31, 2014 and 2013.

### Income Taxes

We recorded a state income tax provision zero and \$2 thousand during the three months ended March 31, 2014 and 2013, respectively. 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 March 31, 2014 due to uncertainty regarding realization of these assets in the future.

Net Loss

We reported net loss of \$2.7 million and \$2.6 million for the three months ended March 31, 2014 and 2013, respectively. Net loss increased approximately \$77 thousand, primarily due to a \$291 thousand increase in operating expenses and a \$59 thousand increase in interest expense, partially offset by an increase in biomedical margin of \$204 thousand and solar margin of \$60 thousand.

Net Income Attributable to Noncontrolling Interest

- 21-

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We reported a net income attributable to noncontrolling interest of \$418 thousand and zero for three months ended March 31, 2014 and 2013, respectively. Net income attributable to noncontrolling interest represents 80.1% of N2 Bio's net income for the three months ended March 31, 2014.

#### Net Loss Attributable to Common Stockholders

We reported net loss attributable to common stockholders of \$3.1 million and \$2.6 million for the three months ended March 31, 2014 and 2013, respectively. Net loss attributable to common stockholders increased approximately \$495 thousand, primarily due to a reduction in net income attributable to noncontrolling interest of \$418 thousand, a \$291 thousand increase in operating expenses and a \$59 thousand increase in interest expense, partially offset by an increase in biomedical margin of \$204 thousand and an increase in solar margin of \$60 thousand.

#### Liquidity and Capital Resources

(in thousands)	March 31, 2014	December 31, 2013	Decrease \$	%	
Cash and cash equivalents	\$2,389	\$3,986	\$(1,597)	(40)	)%
Working capital	\$1,408	\$3,704	\$(2,296)	(62)	)%

Cash and cash equivalents decreased due to cash used in operating activities and to a lesser extent cash used in financing and investing activities. The overall decrease in working capital is due to a decrease in current assets, primarily cash, available-for-sale investments, deferred cost of goods sold and prepaid expenses and other current assets. 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 March 31, 2014, our accumulated deficit was approximately \$27.5 million, compared to accumulated deficit of approximately \$24.4 million as of December 31, 2013.

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 36% and 30% of net sales and revenues for the three months ended March 31, 2014 and 2013, respectively, continue to constitute a significant portion of our net sales and revenues.

Net cash used in operating activities was \$1.2 million and \$790 thousand for the three months ended March 31, 2014 and 2013, respectively. As of March 31, 2014, we had unrestricted cash and cash equivalents of \$2.4 million compared to \$4.0 million as of December 31, 2013.

We currently believe that our existing cash resources at March 31, 2014, will be sufficient to fund our operations into the second half of 2014; however, we cannot assure you of this. The Revolving Credit Facility and the Ex-Im Facility with Silicon Valley Bank expired on April 30, 2014 and will not be renewed. The maturity date of N2 Bio's Secured Revolving Demand Note with Middlesex Savings Bank is May 31, 2014. As a result, in our Annual Report on Form 10-K for the year ended December 31, 2013, 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 dated March 31, 2014.

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, private lenders, 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 or alternative financing, 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 replace our expired credit facilities, could adversely impact our ability to continue as a going concern.

The financial statements do not include any adjustments that might be necessary if we are unable to continue as a going concern.

Loan Agreements

Prior to their expiration on April 30, 2014, we had 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 provided an aggregate amount of \$1.5 million under both facilities, with up to \$1 million under the Revolving Credit Facility and up to \$1.5 million under the Ex-Im Facility. Under the credit facilities, interest on outstanding borrowings accrued at a rate per annum equal to the greater of (i) the prime rate plus 2.5% or (ii) 7.0%.

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 May 31, 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 the Revolving Credit Facility were \$23 thousand and \$107 thousand at March 31, 2014 and December 31, 2013, respectively. Advances outstanding under the Ex-Im Facility were \$118 thousand and \$38 thousand at March 31, 2014 and December 31, 2013, respectively. Advances outstanding under the N2 Bio Secured Term Loan were \$5.6 million and \$5.8 million at March 31, 2014 and December 31, 2013, respectively. Advances outstanding under the N2 Bio Secured Revolving Demand Note were \$338 thousand and \$438 thousand at March 31, 2014 and December 31, 2013, respectively. As of March 31, 2014, the interest rate per annum on the Revolving Credit Facility and Ex-Im Facility was 6.5% and 6.5%, respectively. The interest rate per annum on the N2 Bio Secured Term Loan and Secured Revolving Demand Note on March 31, 2014 was 4.5% and 3.75%, respectively. Combined availability under the Revolving Credit Facility, the Ex-Im Facility and the Secured Revolving Demand Note was \$595 thousand as of March 31, 2014.

#### Net Cash Used in Operating Activities

Net cash used in operating activities was \$1.2 million and \$0.8 million for the three months ended March 31, 2014 and 2013, respectively. As of March 31, 2014, we had unrestricted cash and cash equivalents of \$2.4 million compared to \$4.0 million as of December 31, 2013.

#### 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 during the first three months of 2014 and 2013. Foreign exchange loss included in other expense, net, was nominal during the three months ended March 31, 2014 and 2013.

#### Related Party Transactions

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 under the Bedford Lease was \$390 thousand and \$578 thousand for the three months ended March 31, 2014 and 2013, 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 \$121 thousand for the three months ended March 31, 2014.

#### 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 condensed 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 critical accounting policies affect our more significant judgments and estimates used in the preparation of our condensed consolidated financial statements. A summary of significant accounting policies and a description of accounting policies that are considered critical may be found in our Annual Report on Form 10-K for the year ended December 31, 2013, in Note 2 of the notes to consolidated financial statements and the Critical Accounting Policies section of Management's Discussion and Analysis of Financial Condition and Results of Operations.

Contractual Obligations, Commercial Commitments and Off-Balance Sheet Arrangements

The following table summarizes our gross contractual obligations at March 31, 2014 and the maturity periods and the effect that such obligations are expected to have on our liquidity and cash flows in future periods:

- 24 -

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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)	\$24	\$24	\$—	\$—	\$—
Ex-Im Facility (SVB)	\$118	\$118	\$—	\$—	\$—
Revolving Demand Note (MSB)	\$338	\$338	\$—	\$—	\$—
Term Note (MSB)	\$6,519	\$1,003	\$2,006	\$2,006	\$1,504
Purchase obligations	\$1,170	\$1,130	\$—	\$35	\$5
Unrelated party capital leases	\$5	\$5	\$—	\$—	\$—
Operating leases:					
Unrelated party operating leases	\$136	\$74	\$60	\$2	\$—
Related party operating leases	\$9,634	\$2,124	\$4,439	\$2,201	\$870

Purchase obligations include open purchase orders which are firm, non-cancelable and unconditional. 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 \$666 thousand and \$170 thousand at March 31, 2014 and December 31, 2013, 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 are secured by restricted cash.

### Item 3. Quantitative and Qualitative Disclosures about Market Risk

Not required as we are a smaller reporting company.

### Item 4. 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 the our disclosure controls and procedures (as defined in Rules 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 March 31, 2014 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.

#### Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during the quarter ended March 31, 2014 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1. Legal Proceedings

Except as set forth below, there have been no material changes to the legal proceedings disclosure included in Part I, Item 3 (“Legal Proceedings”) of our Annual Report on Form 10-K for the year ended December 31, 2013.

- 25-

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On February 4, 2011, Silicon International Ltd. ("SI") filed a complaint against the Company in Suffolk Superior Court in Massachusetts, alleging breaches of contract related to SI's activities acting as a former sales and service representative in China. The complaint made claims regarding amounts allegedly owed to SI by the Company. In April 2014, the Company and SI reached a settlement whereby they agreed to the action with prejudice, and the Company agreed to pay a sum with a net present value of \$358 thousand. Payments will be made in installments through October 15, 2018.

#### Item 1A. Risk Factors

Except as set forth below, there have been no material changes in the Risk Factors described in Part I, Item 1A ("Risk Factors") of our Annual Report on Form 10-K for the year ended December 31, 2013.

Our credit facilities with Silicon Valley Bank expired on April 30, 2014, which could have a material adverse effect on our operations and liquidity.

Our credit facilities with Silicon Valley Bank expired on April 30, 2014 and will not be renewed. We are seeking to obtain alternative financing in order to help finance our operations. No assurance can be given that we will be able to obtain any alternative financing. Further, any new financing arrangement may not be on terms favorable to us. Failure to obtain alternative financing could have a material adverse effect on our operations and liquidity.

#### Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

None.

#### Item 3. Defaults Upon Senior Securities

None.

#### Item 4. Mine Safety Disclosures

Not applicable.

#### Item 5. Other Information

None.

Item 6. Exhibits

Exhibit	Description
31.1	Certification of the Chief Executive Officer and President pursuant to §302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of the Chief Financial Officer and Treasurer pursuant to §302 of the Sarbanes-Oxley Act of 2002.
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.
32.2	Certification of the Chief Financial Officer and Treasurer pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002.
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

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Spire Corporation

Dated: May 15, 2014

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

Dated: May 15, 2014

By: /s/ Robert S. Lieberman  
Robert S. Lieberman  
Chief Financial Officer and Treasurer  
(Principal Financial Officer and Principal Accounting Officer)

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