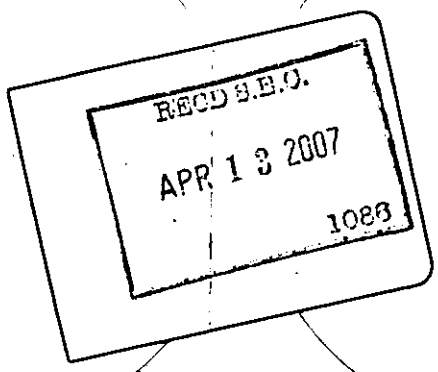
Spire Corporation
2006 Annual Report



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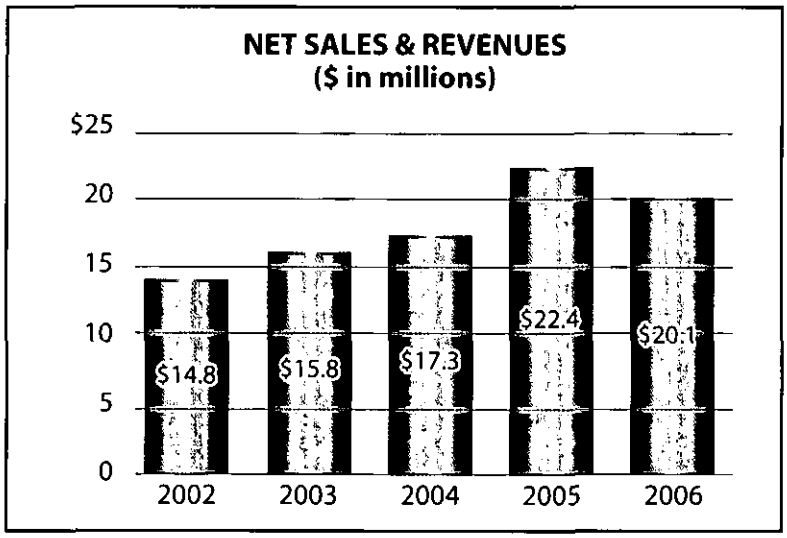


Cover photo: An array of high efficiency gallium arsenide ("GaAs") solar cells for concentrating photovoltaic ("PV") systems fabricated by Spire's Bandwidth Semiconductor operation.

DEAR STOCKHOLDERS, CUSTOMERS AND EMPLOYEES:

Revenues for 2006 were $20,125,000, a 10% decrease from the $22,422,000 for 2005. Net loss for 2006 was $8,151,000 or $1.03 per share, compared with a net income of $44,000 or $0.01 per share for 2005. The 2005 earnings included $6,320,000 recorded from the sales of licenses which is not included in the 2005 revenues. At year end, we had no bank debt and $4.6 million in unrestricted cash and short-term investments.

The solar market grew so fast in 2005 that the industry experienced a shortage in the basic ingredient for most PV modules, polysilicon. Because of the polysilicon shortfall, during 2006 many manufacturers slowed their capital equipment purchases for scaling up. Also, a number of new companies put their startup plans on hold. Even though we still had substantial backlog in our solar equipment area, in part due to thin film producers, we were not able to convert as much of it to sales as we had planned.

We did experience growth in our biomedical and optoelectronic businesses but it wasn't enough to compensate for the decline in solar equipment sales.

Spire Solar is the world's leader in putting new companies into the solar PV business. Recognizing the need for supplies and services to keep these companies in the business, we initiated a new business model adding supplies and services to our turnkey factory products. This continuing revenue model is now being implemented in our marketing activities.

We also brought Bandwidth Semiconductor back into the terrestrial solar cell business. Bandwidth has long had the expertise to fabricate GaAs concentrator cells and is now reintroducing them into the market.

Bandwidth also made progress converting some of their customer development efforts into production orders. An important multi-year contract is to supply multicolored high power semiconductor lasers to the high definition rear projection television market.

Spire Biomedical launched their new heparin-coated catheter, the Decathlon™ Gold, and achieved significant sales in the fourth quarter of 2006. Our medical device processing services also grew tracking the growth of the orthopedics industry.

In summary, we made significant progress on many fronts. Now with the expectation that the polysilicon shortage will be resolved in 2008, manufacturers are scaling up again. Bandwidth's optoelectronic products are gaining ground and our Decathlon Gold coated catheter is making an impact in the industry.

Roger G. Little
Chairman and CEO

Roger G. Little, Chairman and CEO

Spire Solar is implementing a new continuing revenue business model which ties supplies and materials to its sale of turnkey production lines.

Roger Little finishing second in his division in the 2006 Ironman World Championship Triathlon held in Clearwater, Florida in November 2006.

Stephen J. Hogan
Executive Vice President
and General Manager,
Spire Solar

10 Reasons to "Let Spire Put You in the PV Business"

1. **Spire** has over 35 years **experience** putting people into the business successfully.
2. **Spire** is a leader in developing the **technology** needed to manufacture quality products.
3. **Spire** manufactures all the key components of **equipment** necessary for high volume, low cost module production.
4. **Spire's** equipment has demonstrated its **performance** in more than 190 factories worldwide.
5. **Spire** guarantees not just equipment performance but **product performance** and UL listing.
6. **Spire's training** teaches your staff all aspects of production processes and product testing.
7. **Spire** provides **systems engineering** design services to help you address the market.
8. **Spire** provides all the necessary **materials and supplies** to fabricate quality PV modules.
9. **Spire's** research team keeps you in the forefront of **advanced technology**.
10. **Spire** will be there to **expand** your capacity or help you to **backward integrate** into cells and wafers when you are ready.

Spire Solar

Spire Solar sells highly engineered capital equipment to expanding photovoltaic module manufacturers and turnkey factories to new manufacturing startups worldwide.

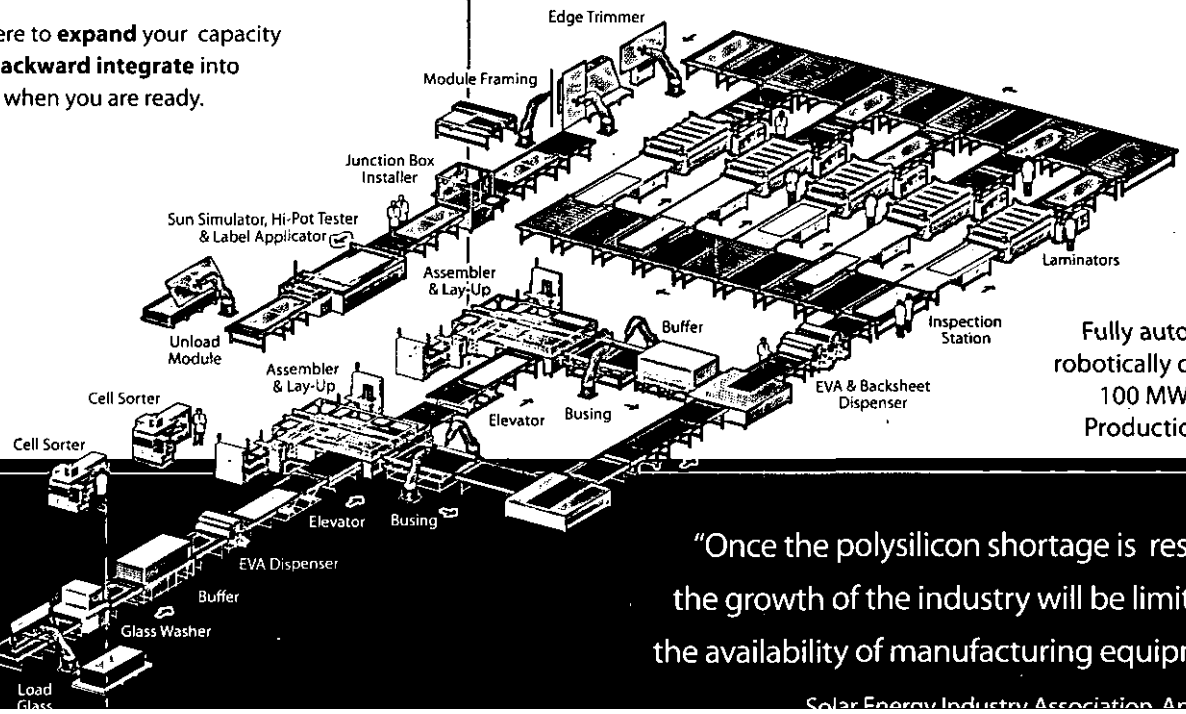
In 2006, manufacturers of crystalline silicon modules slowed their capital equipment purchases to scale up because of the shortfall of polysilicon. However this resulted in an emphasis upon thin film module manufacturing which Spire was able to respond to by providing lamination, test, and other assembly equipment for completing the thin film laminate.

The announced new polysilicon capacity investments worldwide have now encouraged silicon module manufacturers to resume scale up. To address the need for larger and larger manufacturing requirements, Spire now offers robotically controlled totally automated 100 megawatt module production lines to the large manufacturers. Spire also received an order for a solar cell line from a module line customer that wanted to backward integrate.

Also a number of new startups now feel comfortable to go ahead with their plans. This has resulted in significantly increased activity in our PV equipment manufacturing.

Recognizing the importance of cell and other materials and supplies to our startup customers, we have initiated a new supply business model which promises to yield continuing revenues. We now offer solar cells to our module line customers and wafers to our solar cell line customers.

Not only does Spire "Put You in the Business", we "Keep You in the Business".



Fully automated robotically controlled 100 MW/Year Production Line

"Once the polysilicon shortage is resolved, the growth of the industry will be limited by the availability of manufacturing equipment."

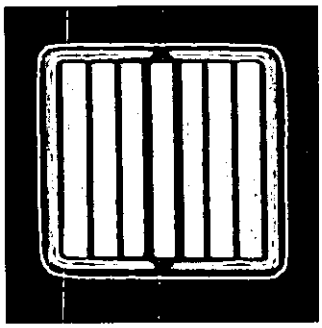
Solar Energy Industry Association, April 2006

Bandwidth Semiconductor

Bandwidth Semiconductor ("Bandwidth") is a dedicated compound semiconductor fabrication facility that develops specialty optoelectronic devices for its customers. Bandwidth engineers also support Spire Solar in the design of high efficiency silicon solar cell processing sequences.

Bandwidth is able to fabricate GaAs concentrator solar cells for the terrestrial PV market. Bandwidth has long had the expertise to fabricate high efficiency GaAs solar cells having set records for single junction efficiency performance as early as 1985. As with thin film PV modules, the polysilicon shortfall has spurred interest in concentrating solar power.

Sunlight can be captured in optical elements and focused on a small cell to produce energy as efficiently as with flat plate non-concentrating PV.



Specialty LEDs fabricated for a medical device company.

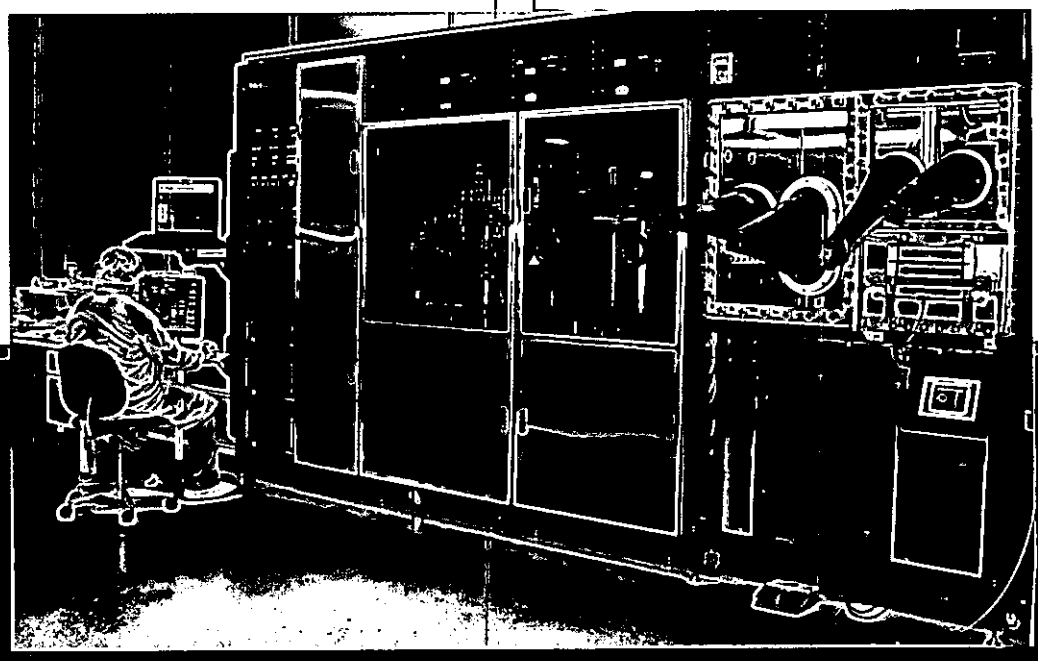
During 2006, Bandwidth worked with a number of customers developing new optoelectronics devices for their instrumentation products. Bandwidth supported customers' needs for light emitting diodes ("LEDs"), lasers, detectors and many more device types. Many of these products have now moved into production and some customers have launched new long-term manufacturing programs with Bandwidth.

A good example is that Bandwidth entered into a long term contract to provide laser devices for rear projection televisions. As televisions grow larger and larger, flat panel technology becomes limited in size so manufacturers are going to light projection. Since light bulbs do not offer the brightness, the resolution or digital capabilities, semiconductor lasers are the solution. Bandwidth's multi-year contract positions them in this industry.

Edward D. Gagnon
General Manager,
Bandwidth
Semiconductor

7 Reasons to Work with Bandwidth to Develop Your Next Optoelectronics Product

1. **Bandwidth** is a complete compound semiconductor fabrication facility dedicated to supporting its customers.
2. **Bandwidth** has its own MOCVD III-V and II-VI epi reactor capability.
3. **Bandwidth** has a first-class compound semiconductor device fabrication facility with class 100 cleanrooms.
4. **Bandwidth's** engineering staff has extensive experience in material and device design, process development and testing.
5. You can work directly with **Bandwidth** engineers.
6. **Bandwidth** can manufacture your products in volume exclusively for you.
7. Working with **Bandwidth** will keep you ahead of your competition.

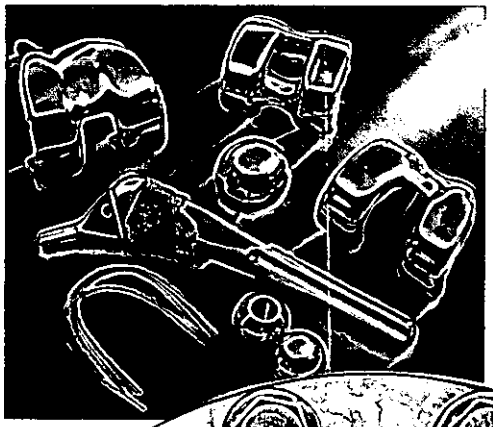


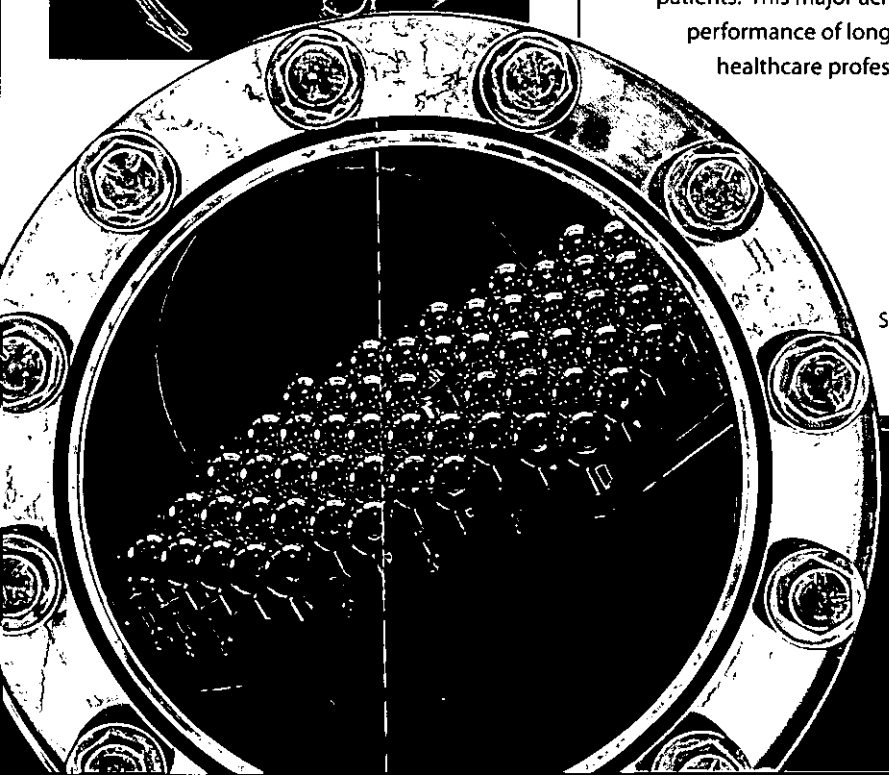
Bandwidth has made significant investments in new metal organic chemical vapor deposition ("MOCVD") reactors to service its customers.

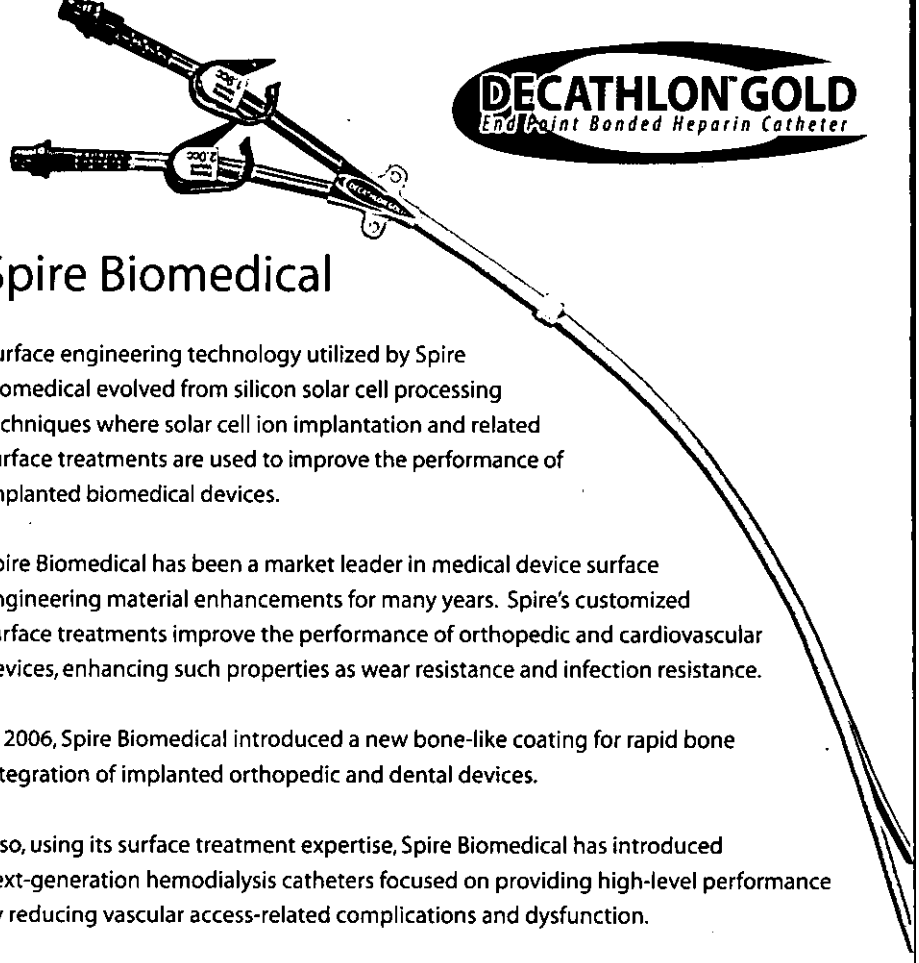
Mark C. Little
Chief Executive Officer,
Spire Biomedical

5 Reasons to Use IonGuard® on Your Implantable Device

1. **IonGuard** makes CoCr, Ti and SS **harder and more wear resistant.**
2. **IonGuard** makes metals and polymers **hydrophillic.**
3. **IonGuard** is used on many **FDA-approved devices.**
4. **IonGuard** can be applied to **finished components.**
5. **Spire** has an **ISO-13485-2003 Certified/ GMP-Compliant** quality system for treating your device.







DECATHLON GOLD
End Point Bonded Heparin Catheter

Spire Biomedical

Surface engineering technology utilized by Spire Biomedical evolved from silicon solar cell processing techniques where solar cell ion implantation and related surface treatments are used to improve the performance of implanted biomedical devices.

Spire Biomedical has been a market leader in medical device surface engineering material enhancements for many years. Spire's customized surface treatments improve the performance of orthopedic and cardiovascular devices, enhancing such properties as wear resistance and infection resistance.

In 2006, Spire Biomedical introduced a new bone-like coating for rapid bone integration of implanted orthopedic and dental devices.

Also, using its surface treatment expertise, Spire Biomedical has introduced next-generation hemodialysis catheters focused on providing high-level performance by reducing vascular access-related complications and dysfunction.

Vascular access-related complications contribute significantly to the $1 - $1.5 billion annual cost of hemodialysis catheter placement and management. The proprietary Decathlon Gold, split-tip heparin-coated hemodialysis catheter, was designed specifically to address the complications of clotting and catheter occlusion, which limit performance and lifetime of these devices. The product was approved by the U.S. Food & Drug Administration ("FDA") in May 2006, and achieved a claim of 94% reduction in clotting based on animal studies.

With the introduction of the Decathlon Gold End-Point Bonded Heparin Catheter, Spire Biomedical is seeking to establish a new standard of care for hemodialysis patients. This major achievement holds the promise to significantly improve the performance of long-term hemodialysis catheters, which will benefit patients and healthcare professionals alike.

Surface treatment solutions reduce wear on orthopedic components, upper left, and femoral heads for hip implants, left.

Corporate Information

Executive Officers
Christian Dufresne, Ph.D.
Chief Financial Officer and Treasurer

Stephen J. Hogan
Executive Vice President and
General Manager, Spire Solar

Rodger W. LaFavre
Chief Operating Officer

Mark C. Little
Chief Executive Officer, Spire Biomedical

Roger G. Little
Chairman of the Board,
Chief Executive Officer
and President

Richard P. Thomley
Chief Accounting Officer and
Corporate Controller

Board of Directors
Udo Henseler, Ph.D., CPA
President and principal/owner
Management Services International
(business development services for biotechnology and life sciences firms)

David R. Lipinski, CFA
Consulting Engineer
WorleyParsons Limited
(provider of professional services to the energy, resource and complex industries)

Mark C. Little
Chief Executive Officer, Spire Biomedical
Spire Corporation

Roger G. Little
Chairman of the Board, Chief Executive Officer and President
Spire Corporation

Michael J. Magliochetti, Ph.D.
President and Chief Executive Officer
Claros Diagnostics, Inc.
(a point-of-care immunoassay diagnostic technology firm)

Guy L. Mayer
Chief Executive Officer and Director
Tutogen Medical, Inc.
(manufacturer of sterile biological implant products)

Roger W. Redmond, CFA
Senior Portfolio Manager
Wells Fargo Private Bank
(investment advisory firm)

SELECTED FINANCIAL DATA

Years ended December 31	2006	2005	2004	2003	2002
	(in thousands, except per share amounts)				
Consolidated Statements of Operations:					
Net sales and revenues	$20,125	$22,422	$17,278	$15,803	$14,822
Gain on sales of licenses	—	6,320	3,000	4,989	4,465
Earnings (loss) before income taxes	(8,151)	44	(4,120)	42	2,569
Income tax benefit (expense)	—	—	—	33	332
Net income (loss)	(8,151)	44	(4,120)	9	2,327
Earnings (loss) per share of common stock - basic	$ (1.03)	$ 0.01	$ (0.60)	$ 0.00	$ 0.33
Earnings (loss) per share of common stock - diluted	(1.03)	0.01	(0.60)	0.00	0.33
Weighted average number of common and common equivalent shares outstanding - basic	7,898	6,975	6,809	6,764	6,750
Weighted average number of common and common equivalent shares outstanding - diluted	7,898	7,237	6,809	6,870	6,842
Consolidated Balance Sheets:					
Working capital	$ 3,938	$ 5,270	$ 3,996	$ 8,182	$10,524
Cash and cash equivalents	1,536	3,630	3,337	5,999	7,799
Total assets	27,684	17,952	20,105	22,792	17,772
Stockholders' equity	9,463	9,255	7,892	11,796	11,775

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM
Vitale, Caturano & Company, Ltd.
Boston, MA

GENERAL COUNSEL
Greenberg Traurig, LLP
Boston, MA

TRANSFER AGENT AND REGISTRAR
American Stock Transfer and Trust Company
New York, NY

STOCK EXCHANGE INFORMATION
The Company's common stock is traded on the Nasdaq Stock Market under the symbol "SPIR". On March 1, 2007, the common stock was held by 193 persons or entities of record, including significant amounts of stock held in "street name". The Company did not pay any cash dividends during 2006 and currently does not intend to pay dividends in the foreseeable future so that it may reinvest its earnings in the development of its business.

ANNUAL MEETING
The 2007 Annual Meeting of Stockholders is scheduled to be held at 10:00 a.m. on Thursday, May 17, 2007 at Spire Corporation, One Patriots Park, Bedford, Massachusetts.

INVESTOR RELATIONS
For further information about the Company or additional copies of this Annual Report, Form10-KSB or other information, visit the Company's website at www.spirecorp.com. The Company will provide to any person without charge, upon written request, a copy of the Form 10-KSB. Any person wishing a copy, should write to Spire Corporation, Investor Relations, One Patriots Park, Bedford, Massachusetts 01730-2396.

The Company's Form 10-KSB for the year ended December 31, 2006, filed with the Securities and Exchange Commission, contains an audited consolidated balance sheet of Spire Corporation and subsidiaries as of December 31, 2006 and the related consolidated statements of operations, stockholders' equity and comprehensive earnings/(loss) and cash flows for each of the years in the two-year period ended December 31, 2006.

END

Spire Corporation
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