



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

DIVISION OF
CORPORATION FINANCE

September 30, 2011

Via facsimile

Mr. Roger Little
Chairman of the Board, Chief Executive Officer and
President
Spire Corporation
One Patriots Park
Bedford, Massachusetts 01730-2396

**Re: Spire Corporation
Form 10-K for the fiscal year ended December 31, 2010
Filed March 15, 2011
File No. 000-12742**

Dear Mr. Little:

We have reviewed your filing and have the following comments. We have limited our review to only your financial statements and related disclosures and do not intend to expand our review to other portions of your documents. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by amending your filing, by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

Form 10-K for the Fiscal Year Ended December 31, 2010

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, page 17

Cash Gain (Loss) from Operations, page 26

1. We note that you disclose your adjusted loss from continuing operations and cash loss from continuing operations. This disclosure appears to be a non-GAAP measure. Please amend to comply with Item 10(e) of Regulation S-K by including the following:

- A presentation, with equal or greater prominence, of the most directly comparable financial measure or measures calculated and presented in accordance with Generally Accepted Accounting Principles (GAAP);
 - A quantitative reconciliation (by schedule or other clearly understandable method) of the differences between the non-GAAP financial measure with the most directly comparable financial measure(s) calculated and presented in accordance with GAAP. In this regard, it appears that you should reconcile your cash loss from continuing operations to your net cash used in operating activities of continuing operations as shown on page 37;
 - A statement disclosing the reasons why the company's management believes that presentation of the non-GAAP financial measure provides useful information to investors regarding the company's financial condition and results of operations; and
 - To the extent material, a statement disclosing the additional purposes, if any, for which the company's management uses the non-GAAP financial measure.
2. Further, please explain why you present cash loss from continuing operations. We note that this measure excludes the deferred tax benefit and changes in assets and liabilities that you include in your net cash used in operating activities of continuing operations on page 37. We also note that the non-GAAP measure includes deferred rent which does not appear to be considered in your net cash used in operating activities of continuing operations on page 37. Please explain why you excluded and included these items and how your presentation is consistent with Item 10(e)(1)(ii)(A) of Regulation S-K.
3. Also, please revise your title for cash loss from continuing operations so that the title of the non-GAAP financial measure is not the same as, or confusingly similar to, titles or descriptions used for GAAP financial measures consistent with Item 10(e)(1)(ii)(E) of Regulation S-K.

Critical Accounting Policies, page 28

4. Given your reference in the paragraph at the top of page 29 to sales returns and allowances and income taxes, please tell us why you do not discuss these estimates in your critical accounting policies.

Item 8. Financial Statements, page 31

Consolidated Statements of Operations, page 35

5. Please explain why you present an amount titled 'Loss from continuing operations' before interest expense, loss on equity investments, foreign exchange loss and other non-operating expenses. In future filings, including any amendments, please revise the title to

accurately reflect its components (e.g., loss from operating activities of continuing operations).

Note 1. Description of the Business, page 38

6. We note that you disclose your adjusted loss from continuing operations and cash loss from continuing operations. This disclosure appears to be a non-GAAP measure. Please amend to comply with Item 10(e)(1)(ii)(C) of Regulation S-K by removing these non-GAAP disclosures from the notes to the financial statements.

Note 2. Summary of Significant Accounting Policies, page 39

Revenue recognition, page 39

7. Please explain further what you mean by recording revenues 'as' title of the product has passed to the customer or 'as' customer acceptance is obtained and not when these events occur.
8. Please explain in more detail the nature of the terms underlying shipments that are FOB, EX-Works Factors, and CIP basis and how these terms are considered in your revenue recognition policy.
9. Please tell us your revenue recognition methods for biomedical and semiconductor processing services. In future filings, including any amendments, please include your revenue recognition policy for these revenues.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Exchange Act of 1934 and all applicable Exchange Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In responding to our comments, please provide a written statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filing;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

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You may contact Kate Tillan, Assistant Chief Accountant, at (202) 511-3604 or me at (202) 551-3671 with any questions.

Sincerely,

/s/ Martin James

Martin James
Senior Assistant Chief Accountant