



DIVISION OF  
CORPORATION FINANCE

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

January 5, 2011

Mr. Michael Bielonko  
Chief Executive Officer  
Cyalume Technologies Holdings, Inc.  
96 Windsor Street  
West Springfield, Massachusetts 01089

**Re: Cyalume Technologies Holdings, Inc.**  
**Form 10-K for the fiscal year ended December 31, 2009**  
**Filed March 22, 2010**  
**File No. 0-52247**

Dear Mr. Bielonko:

We have reviewed your response letter dated December 17, 2010 and your filings and have the following comments. As noted in our letter dated December 9, 2010, 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. Please provide us with the requested information so we may better understand your disclosure.

Please respond to this letter within ten business days 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, please tell us why in your response.

After reviewing the information you provide in response to these comments, we may have additional comments.

Form 10-K for the Year Ended December 31, 2009

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, page 15

1. We note your response to the comment in our letter dated December 17, 2010. We refer to an Item 8.01 Form 8-K filed on December 18, 2008. In this 8-K you disclose that GMS Acquisition Partners Holdings, LLC purchased 2,068,550 shares for \$16,584,490 in a series of transactions. Further we note that you filed a Form 13D on December 29, 2008 which disclosed that GMS Acquisition Partners Holdings, LLC obtained 53 percent of the voting power of the Company. In your response you disclose that GMS only obtained 46.56 percent ownership. Please explain this inconsistency and revise your analysis, if necessary. Also consider the impact on your analysis of the additional information you provide in response to the following comments.

2. You indicate that the shares issued to GMS in the acquisition constituted 27.97 percent of the outstanding shares on a fully diluted basis. Please provide a schedule showing the calculation of shares on a diluted basis. Also discuss whether the warrants and options or other convertible securities were exercisable and in the money at the acquisition date.
3. You indicate that it was the intention of GMS to distribute the shares to its stockholders. Tell us when the shares were distributed and identify whether this resulted in any shareholders receiving a large minority voting interest. Tell us the percentage ownership of the two shareholders that received the right to nominate one or two members of the company's board of directors.
4. Tell us the terms of the initial members of the board of directors at the acquisition date and describe the process for replacing the members.
5. Describe in more detail the CTI senior management group that continued employment with the combined company, including the roles and responsibilities associated with each position. Also discuss the terms of any employment contracts.
6. Tell us whether a valuation of the equity of CTI was prepared prior to or in connection with the transaction. If so, tell us the results of the valuation and how you considered it in assessing whether a premium was paid.
7. In your analysis of the relative size of Vector and CTI you gave primary consideration to the net assets of each entity, instead of the revenues and earnings. Tell us in more detail why you concluded that this factor favored Vector as the acquirer.

You may contact Michael Henderson, Staff Accountant, at (202) 551-3364 or Terry French, Accountant Branch Chief, at (202) 551-3828 if you have questions regarding comments on the financial statements and related matters. Please contact me at (202) 551-3810 with any other questions.

Sincerely,

Larry Spigel  
Assistant Director