



DIVISION OF  
CORPORATION FINANCE

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

December 23, 2010

Mr. Michael A. Gerlich  
Vice President and Chief Financial Officer  
Gastar Exploration Ltd.  
1331 Lamar Street  
Houston, TX 77010

**Re: Gastar Exploration Ltd.  
Form 10-K for Fiscal Year Ended December 31, 2009  
Filed March 25, 2010  
File No. 1-32714**

Dear Mr. Gerlich:

We have reviewed your filing and have the following comments. 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 Fiscal Year Ended December 31, 2009

Production, Prices and Operating Expenses, page 28

1. Please disclose average production cost for each of the last three fiscal years as required by Regulation S-K, Item 1204(b)(2).

Natural Gas and Oil Reserves, page 30

2. While we understand that there are fundamentals of physics, mathematics and economics that are applied in the estimation of reserves, we are not aware of an official industry compilation of "generally accepted petroleum engineering principles" as you refer to on page 31. With a view toward possible disclosure, please explain to us the basis for concluding that such principles have been sufficiently established so as to judge that the reserve information has been prepared in conformity with such principles.

3. Please explain to us how you have complied with the disclosure requirements of Regulation S-K, Item 1206 regarding your present oil and gas producing activities or revise your filing to provide this disclosure.

Proved Undeveloped Reserves, page 34

4. Please tell us whether material amounts of proved undeveloped reserves in individual fields remained undeveloped for five years or more after disclosure as proved undeveloped reserves, and if so, how you addressed the disclosure requirements per Regulation S-K, Item 1203(d).

Exhibit 99.1

5. Regulation S-K, Item 1202(a)(8) specifies disclosure items pertaining to third party engineering reports. Please obtain modification of this report so that it presents justification for the term “generally accepted petroleum engineering and evaluation principles” with a citation/reference to a compilation of these principles. Alternatively, this term could be omitted.

Form 10-Q for Fiscal Quarter Ended September 30, 2010

Financial Statements

Notes to Condensed Consolidated Financial Statements

3 – Property, Plant and Equipment, page 6

6. Please expand your disclosures to explain why exploration activities in East Texas and Marcellus Shale have been extended and/or have not proceeded as planned. In this regard, we note that your disclosed timeframe of six and ten years, respectively, has remained unchanged in your periodic filings for over a year.

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;

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- 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.

You may contact Sandy Eisen at (202) 551-3864 if you have questions regarding comments on the financial statements and related matters. Please contact me at (202) 551-3311 with any other questions.

Sincerely,

Ethan Horowitz  
Branch Chief