

Via Facsimile and U.S. Mail
Mail Stop 6010

December 21, 2006

Mr. Robert J. DeLuccia
President and Chief Executive Officer
MacroChem Corporation
40 Washington Street
Suite 220
Wellesley Hills, MA 02481

**Re: MacroChem Corporation
Form 10-K for Fiscal Year Ended December 31, 2005
File No. 0-13634**

Dear Mr. DeLuccia:

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 our comments, we ask you to provide us with more information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filings. We look forward to working with you in these respects. We welcome any questions you may have about our comment or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form 10-K for the year ended December 31, 2005

Management's Discussion and Analysis of Financial Condition and Results of Operations

Results of Operations, page 36

1. Please provide us in a disclosure-type format a revised discussion that clearly reconciles the charges you indicate for the termination of your non-management personnel and your executive transition agreements to the \$546,212 presented in your 2005 statement of operations. In addition, please explain to us why the charge for these items is reflected as \$751,277 in your September 30, 2005 statement of operations provided in your September 30, 2006 Form 10-Q.

Financial Statements

Note 4: Stockholders' Equity

Authorized Capital Stock, page 55

Stock Sales, page 55

2. You disclose that your Series C Preferred Stock is redeemable at the option of the holder in the event you fail or refuse to convert any of these shares into common stock. In addition you disclose that the conversion rate of this stock could be adjusted if the average trading price for the twenty trading days immediately proceeding May 8, 2006 was lower than the stated conversion price. Please address the following comments for each of your December 2005 and February 2006 preferred stock issuances in the context of your 2005 Form 10-K disclosures and 2006 Forms 10-Q disclosures, respectively:
 - a. Please provide us in a disclosure-type format revised disclosure that clarifies why you reflect your Series C Preferred Stock in the mezzanine between debt and equity. It is unclear from your current disclosure how this stock is redeemable at the option of the holder if such redemption is subject to your actions or inactions. Please see EITF D-98.
 - b. Please provide us in a disclosure-type format revised disclosure that clarifies why you do not apparently accrete your carrying value of preferred stock to its redemption value.
 - c. Please provide us in a disclosure-type format revised balance sheets that reflect the aggregate liquidation value of your preferred stock as required by paragraph 6 of SFAS 129.
 - d. Please explain to us how you considered the conversion price adjustment indicated above in your EITF 00-19 analysis of the embedded conversion feature of your Series C Preferred Stock. In this regard, please specifically indicate the impact of this adjustment feature as it pertains to paragraph 19 of EITF 00-19.
 - e. Although your statements of operations indicate that your beneficial conversion feature is discussed in Notes 4 and 8, we are unable to locate this disclosure. Please provide us in a disclosure-type format revised disclosure that clearly indicates how you determined this beneficial conversion feature. In addition, please explain to us how you considered the requirements of paragraphs 5-7 of EITF 00-27 to compute the beneficial conversion feature based on the effective conversion price after allocation of the proceeds to your preferred stock and associated warrants.

Warrants, page 55

3. Although you indicate in your disclosure here and in your 2006 Forms 10-Q that you record a warrant liability for the warrants issued in conjunction with your

Series C Preferred Stock, you do not appear to indicate why you believe EITF 00-19 requires liability treatment. Please provide us in a disclosure-type format revised disclosure that clearly indicates why you treat these warrants as liabilities and separately provide us your analysis under EITF 00-19 supporting your conclusions. In your separate response, please ensure that you address each of the criteria of paragraphs 12-32 of that consensus.

4. Please provide us in a disclosure-type format revised disclosure that clearly indicates how you accounted for the warrants issued to the placement agent in your Series C preferred stock issuances. Please indicate whether these warrants are included in your warrant liability and your rationale for either including or excluding them.

General

5. Please provide us in a disclosure-type format the selected quarterly financial data required by Item 302(a) of Regulation S-K or tell us why this information is not required.

Exhibits 31: Certifications Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002

6. Please represent to us that in future periodic report filings you will provide the wording of the certifications exactly as presented in Item 601(b)(31) of Regulation S-K. In this regard, your most recent certifications appear to include the adjectives “annual” and “quarterly” when identifying the report covered by the certifications.

Please respond to these comments within 10 business days or tell us when you will provide us with a response. Please submit a letter that keys your responses to our comments and provides the requested information. Detailed letters greatly facilitate our review. Please submit your letter to us via EDGAR under the form type label CORRESP.

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 all information required under the Securities Exchange Act of 1934 and that they have provided all information investors require for an informed investment decision. 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 connection with responding to our comments, please provide, in your letter, a 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.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in our review of your filing or in response to our comments on your filing.

If you have any questions, please contact Mark Brunhofer, Senior Staff Accountant, at (202) 551-3638. In this regard, do not hesitate to contact me, at (202) 551-3679.

Sincerely,

Jim B. Rosenberg
Senior Assistant Chief
Accountant