January 16, 2008

Mail Stop 6010

Robert P. Hebert
Chief Financial Officer
CPEX Pharmaceuticals, Inc.
2 Holland Way
Exeter, NH 03833

Re: CPEX Pharmaceuticals, Inc.
Registration Statement on Form 10-12B, filed December 21, 2007
File No. 1-33895

Dear Mr. Hebert:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your documents in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with supplemental information so we may better understand your disclosure. After reviewing this information, we may or may not 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 filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

FORM 10-12B

General

1. We note that in connection with the spin-off the company will issue its common stock to Bentley and Bentley will distribute that common stock to its own shareholders on a pro-rata basis. We also note that in connection with the spin-off the company will issue 1,000 shares of its non-voting Series B Preferred Stock to Bentley but that preferred stock will be sold by Bentley to a third party. It appears that the shareholders of Bentley will not have the same proportionate interest in the company and Bentley both before and after the spin-off, rendering the distribution a spin-off that can not be characterized as pro-rata. In accordance with Staff Legal Bulletin No. 4, if the spin-off is not pro-rata it must be

registered as a sale of securities under the Securities Act of 1933. Please provide us with a supplemental analysis explaining your apparent conclusions that this distribution is appropriate to be registered on Form 10. Alternately, please withdraw this Form 10 and file a registration statement on an appropriate Securities Act form for the distribution.

2. Unless otherwise indicated, references to page references and captions in this letter are to the information statement filed as exhibit 99.1.

3. We will need time to review all new disclosure, including all the exhibits. You can expedite the review process by filing all such documents promptly.

4. Please note that where we provide examples to illustrate what we mean by our comments, they are examples and not exhaustive lists. If our comments are applicable to portions of the filing that we have not cited as examples, make the appropriate changes in accordance with our comments.

5. Throughout the information statement, you cite various estimates, statistics and other figures. For example:

   - The statistics regarding drug development on page 58;
   - Information included under "Products" on page 59;
   - Information included under "Products in Development" on page 60; and
   - Information included under "Overview of Testosterone Replacement Market" on page 61.

   In the information statement, please attribute these statements and other similar statements to the source from which you obtained the information. In addition, where you cite your own estimates, please briefly disclose in the information statement how you arrived at those estimates and disclose any third-party sources you relied upon. If any of your assertions of beliefs are not supported by ample evidence or knowledge, you should consider deleting them.

6. Please provide additional support for, the following statements or consider deleting them:

   - Page 1, "we have considerable scientific expertise in the areas of endocrinology and metabolic diseases and replacement therapies including treatment for diabetes."
   - Pages 1 and 58, that you have "extensive experience with Testim and Nasulin."

EXHIBIT 99.1 INFORMATION STATEMENT

CPEX Cover Letter

7. Please provide additional support for the statement "a proven track record in the development of pharmaceutical products" or consider deleting it. We note that you have licensed you technology to Auxilim which then launched Testim and that Nasulin is in Phase I and II drug trials, but we believe that this alone does not appear to be sufficient support for the statement "a proven track record."

8. We note that you also state that "We also may be able to reduce manufacturing costs for certain products as a result of our proprietary manufacturing processes." We did not find any support for such statement in the information statement. Please revise your information statement to provide such support, or consider deleting the statement.

Summary, page 1

Our Company, page 1

9. The summary should provide a balanced presentation of the information presented in the body of the filing. As currently written, your summary focuses only the positive attributes of the company. Please balance the discussion of your strategy with a discussion of your challenges and risks. This new disclosure should be at least as prominent and detailed as your discussion of your strategy.

The Separation, page 4

10. We note that you state that the company maintains a website www.cpexpharma.com, but it does not appear that this website is currently up and running. Please revise to state that the company intends to maintain a website for the company at www.cpexpharma.com. In addition, please state when the company intends to have the website up and running.

Questions and Answers about CPEX Pharmaceuticals, Inc. and the Separation, page 4

What will the separation cost? page 6

11. Please to include the estimated incremental expenses associated with being an independent company. We note that you provide such information on page 45.

Summary of the Separation, page 9

12. Please revise this section to include a discussion of the sale of the 1,000 shares of the company's Series B Preferred Stock to the unaffiliated third party. Please also name the third party here.

Summary Historical and Unaudited Pro Forma Condensed Combined Financial Data, page 12

13. Please revise your footnote to quantify the additional estimated costs which you reference from your notes to your financial statements.

Risk Factors, page 14

General

14. We note your disclosure on page 69 that the initial patent for the company's CPE-215 technology expires in the U.S. in June 2008 and expired in all markets outside the U.S. in 2006. Please revise this section to include a risk factor which addresses the risks which the company faces as a result of this patent expiration.

"All of our revenues to date have been generated from the out-licensing of our CPE-215 technology…" page 15

15. Please quantify the revenues and expenses in connection with Testim for the last three years.

"Products using our technologies are in various stages of development…" page 16

16. Please list all of the proposed products which are currently in development with your technologies.

"We are highly dependent on the development and commercial success of … Nasulin…" page 17

17. Please revise to disclose any significant problems, significant side effects or unsuccessful results from your Phase I, Phase II, or Phase IIA studies which you have conducted to date for type I and type II diabetes.

"If we are unable to meet our responsibilities under any of our agreements…" page 18

18. Please revise this risk factor to discuss the specific agreements which the company feels this risk factor applies.

"Implementation of new information systems could cause business interruptions…" page 21

19. Please disclose when you intend to upgrade and replace your systems. Please disclose the approximate cost of this upgrade and replacement. In addition, please disclose what systems, other than your financial systems, you intend to upgrade and/or replace.

"We may be unable to meet increasing expenses and demands on our resources from future growth…" page 21

20. Please disclose whether the company has any current plans to hire additional personnel.

21. Please revise your last sentence of this paragraph to clarify that the company has never been profitable.

"If we cannot attract and retain key personnel…" page 22

22. Please provide more information about your historical problems with recruiting candidates.

"We may incur substantial liabilities and may be required to limit commercialization of our products in response to product liability claims." Page 22

23. To the extent material, please disclose the cost of your product liability and clinical trials insurance.

"We may be unable to make … the changes necessary to operate as an independent company…" page 24

24. Please revise this risk factor to include the estimated incremental expenses associated with being an independent company. We note that you provide such information on page 45.

The Separation, page 30

General, page 30

25. Briefly explain how the terms if the spin-off were determined.

Reasons for the Separation, page 30

26. Please include a discussion of any negative aspects of the separation considered by the board of directors, e.g. costs, long term prospects, etc.

Certain U.S. Federal Income Tax Consequences of the Distribution, page 32

27. Please revise to clarify that you are summarizing the "material" tax consequences, instead of only "certain" tax consequences.

Selected Historical Combined Financial Data, page 40

28. Please revise to properly identify which financial information has been included in the filing and those that are not. For instance, you indicate that the audited combined financial information for the years ended December 31, 2006 and 2005 are not included in the filing.

Unaudited Pro Forma Condensed Combined Financial Statements, page 41

29. We believe the objective of the historical carve-out financial statements is to demonstrate the track record of management and the normal evolution of the business over time. In this regard, we believe the pro forma financial statements may be the best place to reflect the assets and results of operations to be included in CPEX's financial statements. As SAB Topic 1.B.2 indicates, the effects of changes in cost sharing and other contractual arrangements should be reflected in the pro forma financial statements as well as adjustments to exclude the assets and operations not transferred to CPEX. Refer to SAB 93 (Topic 5.Z.7 Question 8) by analogy. The conditions listed that are relevant, among other factors, in evaluating whether carve-out financial statements make sense and fairly present the history of the business are:

    a. The Company and the subsidiary are in dissimilar businesses
    b. They were and will be operated autonomously both before and after the spin-off, and
    c. They have no more than incidental common facilities and costs.

    Please explain to us why the presentation of the carve-out financial statements from the historical operations of Bentley Pharmaceuticals, Inc. is appropriate and ensure you address each of the three factors noted above in your response. Please reference for us the authoritative literature you rely upon to support your position. Otherwise, please revise your filing to include the historical financial statements of Bentley Pharmaceuticals, Inc. and pro forma financial statements for the latest year and interim period under Article 11 of Regulation S-X.

Management's Discussion and Analysis of Financial Condition and Results of Operations, page 46

Contractual Obligations, page 54

30. Please revise the table to include the amounts payable pursuant to agreements with suppliers, vendors, consultants, clinical sites and outsourced services which you state in

footnote 1 that you have omitted from the table. Note that even though these agreements may be cancelled in a short period of time or are at will agreements they still appear to be enforceable and legally binding agreements. In addition, because the table is aimed at increasing the transparency of cash flow, we believe these payments should be included in the table. Please use a footnote to disclose any assumptions that you make.

31. Please explain to us why you do not include the management employment agreements that are expected to be transferred to CPEX from Bentley.

Business, page 58

General

32. Please file copies of your development agreements with University of New Hampshire and Dartmouth College. In addition, please revise the business section to summarize these agreements and provide the status as to the development. Please disclose in your summary all the material terms of these agreements, including payment provisions, royalties, aggregate milestones, exclusivity provisions, material obligations that must be met to keep the agreement in place, and duration and termination provisions.

33. We note on page F-20 that the company is obligated to pay certain royalty payments upon commercialization of products using your CPE-215 technology acquired in 1999 and your intellectual property acquired in 2003. Please file copies of these agreements and revise the business section to summarize these agreements. Please disclose in your summary all the material terms of these agreements, including payment provisions, royalties, aggregate milestones, exclusivity provisions, material obligations that must be met to keep the agreement in place, and duration and termination provisions.

Overview, page 58

34. Please summarize the results of your Nasulin the trials which you disclose in this section in the section “Development and commercialization of Nasulin” on page 65.

35. In addition, please clarify here and on page 1 whether each Phase I and Phase II study for Nasulin you disclose is in connection with type 1 or type 2 diabetes.

Products, page 59

36. We note that you state that Testim accounted for 20.1% of the U.S. testosterone gel market as of August 2007 and that AndroGel accounted for 81.7% of gel prescriptions as of December 31, 2006. Please revise to clarify whether the “U.S. testosterone gel market” refers to the same market as the “gel prescription market.” If these refer to different markets, please explain the differences and, if available, please provide the percentages for the same market.

37. We note that you state your primary competition for Testim is AndroGel and others. Please revise to clarify what other companies or products you consider to be your primary competition.

Products Available for Licensing, page 60

38. We note that you completed two Phase I/II clinical trials for the treatment of nail fungal infections in 2002 and 2003, but you have not provided any further information as to the current status of this product. Please revise this section to provide an update on this product or clarify that no developments have occurred since 2003.

39. We note that you have granted Auxilium a worldwide license to develop, market and sell a topical hormonal therapy containing the company's CPE-215 technology. Please also quantify the expenses and revenues incurred to date under this agreement. Please confirm that this is not an exclusive license.

40. We note that Auxilium has the right to license the intranasal delivery of a pain management chemical agent pursuant to your research agreement, but has not activated the license to date. Please revise this section to state whether the company has the right to license the product to another company. If so, please state whether the company intends to seek to do so. Please also quantify the expenses and revenues incurred to date under this agreement.

Sources and Availability of Raw Materials, page 64

41. Please state here and in the risk factor on page 17 the number of potential sources of suppliers of CPE-215 which the company has identified.

42. Please state here and in the risk factor on page 17 the name of the supplier the company currently uses for its supply of CPE-215. If the company is substantially dependent on this supplier, please describe all the material terms of the agreement, including payment provisions, aggregate milestones, exclusivity provisions, material obligations that must be met to keep the agreement in place, duration and termination provisions, and file a copy of the agreement. Alternatively, if you have determined that you are not substantially dependent on this party, please provide us with an analysis supporting this determination.

Development and commercialization of Nasulin, page 65

43. We note that you have conducted trials for both type 1 and type 2 diabetes, but that you emphasize the treatment of and the trials related to type 2 diabetes on pages 62 through 64. Please clarify whether the company is predominately concentrating on type 2

diabetes. In addition, please state whether the Phase III trial will be for type 1 or type 2 diabetes.

Partners/Customers, page 64

44. Please file a copy of your license agreement with Auxilium dated as of May 2000. In addition, please revise this section to describe the material terms of this agreement, including payment provisions, royalties, aggregate milestones, exclusivity provisions, material obligations that must be met to keep the agreement in place, and duration and termination provisions. Please also disclose the payments made and royalties received to date under this agreement.

Operations, page 69

45. We note that the address of the company's principal place of business is the same address as Bentley's principal place of business. Please confirm that both companies will remain at the facilities. In addition, please confirm that the company will own the facilities following the spin-off.

Intellectual Property, page 69

46. Please expand the discussion to disclose all material patents, the jurisdiction in which they were issued, the technology to which the patent relates and the year of expiration.

Management, page 71

General

47. Please update your disclosures in the subsections "Director Compensation Pre-Distribution" on page 73 and "Historical Compensation of our Executive Officers Prior to the Distribution under Bentley" starting on page 78 to include 2007 compensation.

The Board of Directors Following the Separation, page 72

48. We note that you expect to have a five member board and that additional directors will be appointed following the distribution. When known, revise to include all necessary disclosure, including the disclosure required by Items 401, 403, 404 and 407 of Regulation S-K.

Compensation Discussion and Analysis, page 74

Compensation Elements, page 75

49. When available, please file a copy of the company's 2008 Equity and Incentive Plan.

Executive Officer Agreements, page 77

50. Please expand your disclosure to clarify how the employment agreements with Messrs. Sedor and Hebert will help assure your executive officers' objectivity in considering shareholders' interests.

51. Please revise this section to include a description of all the material terms of with Messrs. Sedor and Hebert current employment agreements with Bentley. Please also clarify if Bentley intends to transfer the employment agreements, as disclosed on page 54, or if the company intends to enter into new employment agreements, as disclosed on page 77. If the company intends to enter into new employment agreements, please revise your disclosure when such terms are known to include all material terms of the employment agreements with Messrs. Sedor and Hebert. Please file copies of the employment agreements after such agreements are finalized.

Historical Compensation of our Executive Officers Prior to the Distribution under Bentley, page 78

52. Please confirm that Messrs. Sedor and Herbert did not receive any pension benefits or nonqualified defined contribution or deferred compensation benefits in the last fiscal year.

Certain Relationships and Related Party Transactions, page 84

53. Please provide the information required by Item 404(b) of Regulation S-K.

Description of Capital Stock, page 87

54. When available, please file a copy of your Rights Plan.

CPEX Pharmaceuticals, Inc. and Subsidiary
Financial Statements for the years ended December 31, 2006, 2005 and 2004

Revenue Recognition, page F-9

55. Your disclosure related to the applicability of EITF 00-21 is very vague. Please provide a discussion of the actual agreements that cause you to apply this treatment. In that discussion include the obligations associated with each agreement. Include the actual revenue precognition provisions related to each unit of accounting since EITF 00-21 is designed to help with the determination of separation.

Segments of an enterprise and related information, page F-11

56. Please tell us what consideration was given to provide the geographic information related to Europe and U.S. operations. Refer to paragraph 38 of FAS 131.

* * * * *

As appropriate, please amend your filings in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested supplemental information. Detailed cover letters greatly facilitate our review. Please file your cover letter on EDGAR under the form type label CORRESP. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings reviewed by the staff to be certain that they have provided all information investors 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 connection with responding to our comments, please provide, in writing, a statement from the company acknowledging that,

- the company is responsible for the adequacy and accuracy of the disclosure in the filings;

- staff comments or changes to disclosure in response to staff comments in the filings reviewed by the staff 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.

You may contact Sasha Parikh at (202) 551-3627 or James Atkinson at (202) 551-3674 if you have questions regarding comments on the financial statements and related matters. Please contact Jennifer Riegel at (202) 551-3575 or me at (202) 551-3715 with any other questions.

Sincerely,

Jeffrey P. Riedler
Assistant Director

cc: Paul Donnelly
Skadden, Arps, Slate, Meagher & Flom LLP
Four Times Square
New York, New York 10036