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October 12, 2006

Chancellor Peterson
17 UCB
Regent 301
Boulder, CO 80306

Dear Chancellor Peterson:

The Colorado Commission on Higher Education is required by Section 23-1-106(5)(a)(b), C.R.S. to approve plans for any capital construction projects at any state institution requiring state funds greater than or equal to five hundred thousand dollars. This letter is to inform you that on October 5th, the Commission approved the following new program plan for the University of Colorado- Boulder:

- **Systems Biotechnology Building**

Decisions on whether or not to fund the above project will be made by the Colorado State Legislature in the 2007 session. Enclosed is the CCHE staff review of the above program plan. Thank you for submittal of this project in a timeframe that allowed for an appropriate review and submittal to the Capital Development Committee and Office of State Planning and Budgeting.

If you have any questions, please contact CCHE capital assets staff Andy Carlson or Ryan Stubbs at 303-866-2723.

Sincerely,

Diane Lindner
Chief Financial Officer
Colorado Commission on Higher Education

cc/encl: Bridget Mullen, CU System; Robert Moore, CU System; Rob Kohrman, CU System; Steven Thweatt, CU; Jennifer Moe, CDC; Bill Daley, OSPB; Andy Carlson, CCHE; Eric Kurtz, JBC; Larry Friedberg, State Architect

PROGRAM PLAN EVALUATION FY 2007-08
Colorado Commission on Higher Education

Project: Systems Biotechnology Building	Institution: University of Colorado at Boulder
Original Submittal Date: 7/24/2006	Revision Date
Total Project Cost: \$112,855,000	Total Square Footage: 250,794
Anticipated Project Completion Date: December 2009	New Construction: 250,794
Construction Cost: \$87,885,931	Remodel: N/A
Purpose Code: F5	Cost per Square Foot: \$450.00
	Construction Cost per Square Foot: \$350.31

Phased Funding:

	2007-08	2008-09	2009-10	2010-11	2011- 12	Total
CCFE	\$2,409,140					22,570,876
CF						
CFE	\$9,636,630					\$90,284,133
FF						
Total	\$12,045,769					\$112,855,000

EVALUATION

Project Description:

The proposed project is to construct a new Systems Biotechnology Building on the research campus at CU Boulder. The research campus is located east of CU's main campus between 30th Street and Foothills Parkway. A building site identified as Pod I located on the southwest corner of the research campus has been identified as the best possible site for this new building. The new building will create 250,794 gross square feet (gsf) and 185,773 assignable square feet (asf) of academic and research space. The Proposed Systems Biotech Building would include research labs that facilitate interdisciplinary research, graduate and undergraduate training, collaboration with corporate partners and support faculty, students and staff in three major units of CU: the Biochemistry Division of the Chemistry and Biochemistry Department, the Chemical and Biological and Engineering Department and the Colorado Initiative in Systems Biotechnology (CISB). The biochemistry division, currently housed in Christol Chemistry on the main campus would move to the new facility along with the Chemical and Bioengineering Department which is currently located in the engineering department. Chemical and Bio Engineering is also currently in the process of adding a new undergraduate department to accommodate student demand. CISB is a new initiative with the goals of enhancing core research areas at the forefront

of molecular technologies applied to biosciences, creating a magnet for attracting outstanding students and faculty, to promote interdisciplinary collaborations and to support biotechnology industrial development. CISB currently has 5 faculty members that will move to the new facility and foresees bringing on a total of 20 faculty members in the new facility. The Systems Biotechnology Building will be the first academic building on the main campus and is proposed as an organizing element for future buildings on the research campus, linking the two through transportation systems and communication technology.

Project Justification:

The project's three main justifications include growing enrollment trends for the program, a strategic alignment of university goals and economic growth in an emerging industry and existing program deficiencies.

The enrollment trends table indicates growth in both the Chemical and Biological Engineering and Chemistry and Biochemistry departments, even though total campus enrollment is not projected to increase.

The project also works towards achieving the goals of the College of Engineering, the College of Arts and Sciences and the University as a whole. These goals, focused on excellence and innovation, resonate in terms of advancing bioscience in Colorado. Colorado is home to over 100 biotechnology firms and is one of the fastest growing states for the life sciences and biotechnology industries. Between 1998 and 2003, the number of companies grew by 35%, outpacing the national growth rate. Also, biotech research has been the leading contributor to CU-Boulder's technology transfer financial results. 15 companies have been created and 111 licenses have been granted for technologies. Bioscience related departments accounted for 80% of CU-Boulder's royalty income for a total of \$23 million of royalty income from 1996-2005.

The project is also seen as necessary due to existing programmatic/operational deficiencies in the Chemical and Biological Engineering Department. In 2003-2004 the department was subject to a university required, once every seven years review of the program. The review entailed internal and external analysis of the program and one of the key recommendations was the construction of a new building. Also, the proposed addition of an undergraduate program in the department will create additional stress on current program space. Additionally, the CISB has no existing space and current facilities are housed in non-contiguous space loaned by the participating departments.

CCHE Recommendations:

CCHE recommends the approval of the program plan pending the submittal of a third part review for the *Systems Biotechnology Building* to meet growing enrollment trends and to align university goals with economic growth in an emerging industry.

CCHE Comments:

1) When will a third party review of this program plan be completed?

The third-party review will be complete by September 15th .

2) Will CU be able to raise the \$90,284,133 in cash funds needed to complete these projects? Where does the university anticipate these funds coming from?

CU-Boulder does expect that we will be able to raise the money to complete this project. Various departments and technology transfer revenues would constitute about 30% of the revenues. Another 30% could come from debt repaid from indirect cost recovery on new research performed in the building. The last 40% could come from private donations that are interested in participating in the project.

3) How will academic functions at the research park interact with the private industry functions at the site?

There will be several ways in which academic functions will interact with private industry functions. The building is designed to support research meetings and seminars among faculty, students, and industry. There will also be opportunities to lease space to biotechnology incubator companies prior to hiring of the faculty growth lines. This model was used successfully after the construction of the MCDB Biology Building where initially, the faculty lines were not in place, and the top two floors were leased to local biotechnology companies.

4) Were academic functions planned in the original Master Site Development Plan for the Research Park?

In the original Master Site Development Plan for the Research Park academic functions were not a central focus of the plan. However, it was the intent to create new research and employment opportunities for faculty, students and graduates and to foster the interactions of students and faculty through research.

As the Main Campus has densified, the Research Park is more and more being seen as a new "science campus" where academic, research and living could be integrated together. The university is looking at the long-term disposition of this property and how it might best serve the campus' needs. The next Campus Master Plan will likely study changes to the Research Park to accommodate campus growth.

5) Please explain the relationship between the proposed Systems Biotechnology Building and the biotechnology development efforts at the Fitzsimons campus. Will the program overlap efforts being made in Colorado to promote biotechnology industries?

There is synergy rather than overlap between the biotechnology efforts at CU-Boulder and UCDHSC, and numerous collaborations already exist between investigators at CU-Boulder and UCDHSC. The two are complementary. The Systems Biotechnology Building in Boulder will support academic faculty and programs that will foster the discoveries that lead to the founding of startup companies, but the building will not provide the infrastructural support for startups. We envision that the research undertaken in the Systems Biotechnology Building will yield novel technologies and strategies for therapeutics and diagnostics, which would eventually be applied to specific diseases by companies at the Fitzsimons campus.

6) Will the move of the Chemical and Biological Engineering Departments out of the main campus engineering building have any possible adverse affects on departments that will remain in the engineering building?

In fact, the main effect of this move on other departments will be positive. The vacated space will provide critically needed high quality laboratory space, faculty offices, and graduate student space for other engineering departments. Technologies such as video conferencing will be available to link the current engineering building to the new facility, and there are plans for transportation to make access to the new building simple. Note that the distance from the current engineering building to the new biotechnology building is about the same as the distance from the engineering building to the chemistry buildings and science library on the main campus (0.7 mi) and so may be reached by foot or bicycle.

7) How would you describe the success of the Research Park so far? Will this move help attract private sector companies to the Research Park?

The Research Park has been successful in that it has provided a framework for development that has allow select industries to partner with the CU-Boulder. The university has always been very careful about the types of industry that goes into the park and at what rate development occurs. As noted above, the institution is moving away from a solely research-oriented, suburban research park model to one of a "science campus" model where high-quality science is performed. This type of model is more likely to be university related than private industry.

8) How does this move shape the future of the research park in terms of land use? Are revised site master plans being considered?

As noted above, the need for areas for university research to grow is forcing a re-examination of the long-term disposition of the Research Park. The park was based on suburban research and industrial parks common in the 1980's and at the time of its development, it was on the edge of Boulder. Today, the Research Park is in a central location and will be served by a new "transit village" being planned as a part of the Fast-Tracks initiative. A low-density, suburban research park is no longer the best use of this valuable asset.

While the Systems Biotechnology Building is in conformance with the existing planning for the selected site, the long-term strategic planning for the site is being reconsidered. This will be studied as a part of the Campus Master Plan process due in 2008.

9) Does the University have projections for the number of students that will enter the undergraduate Chemical and Biological Engineering program? If so, are space estimates in this program plan taking these figures into consideration when planning?

The University estimates that there will be a significant increase in the number of undergraduates majoring in Chemical and Biological Engineering over the next five years. The space estimates in this program plan do take the increases in student enrollment into consideration when planning. The University is confident that the space estimates provided in this program plan will be adequate for the growing number of students projected to major in Chemical and Biological Engineering.

10) Have other institutions attempted similar academic clustering of biotech related departments? If so, have they been successful? How has this influenced the design of this project?

The Biotechnology task force has invested significant time in comparing this project to other similar biotech development efforts at other universities. Examples include BioX at Stanford University, the Life Sciences Initiative at Cornell University, the Genome Sciences and Policy Institute at Duke University, and the University of Michigan's Life Science Initiative. Each of these initiatives has been recognized as tremendously successful, has recruited and retained top faculty, and has had significant growth in interdisciplinary research grants. A key and critical aspect in the design of these facilities was lowering traditional barriers to interdisciplinary research. This meant bringing together research groups organized around research concepts (e.g., biotechnology) instead of traditional academic disciplines, design of interactive spaces and shared facilities, and assembling the critical mass of investigators (students and faculty) to nucleate the effort, all of which have been considered in the program plan for the Systems Biotechnology Building.

11) Please provide justification for high costs per square foot.

The Systems Biotechnology Building is not an expensive wet laboratory building. The University of Colorado at Boulder participated in the Stanford University Benchmarking Study of higher education construction costs. The study looked at construction costs of higher education facilities with adjustments for location and time of construction. The 33 building average total cost of construction in 2004 in the San Francisco market was \$541.15 per square foot (\$378.43 per square foot average construction cost). Translating this to the Denver market in 2006, the average cost today would be \$502.44 per square foot. Projecting out to the anticipated start of construction would yield an average total project cost of \$533.04 per square foot for the Denver market. This compares to the budget request of \$429.66 per square foot. CU-Boulder's projects are consistently below national average due to the economical labor market in the region.

Program and Facility Requirements:

The program plan includes a space analysis for the proposed building in section 3.0 and as an appendix in section 7.7. Here, detailed space estimates are shown in terms of assignable square feet for each program and function for the proposed systems biotech building.

- 4,585 asf is scheduled for Administration space for Chemical & Biological Engineering, Biochemistry and CISB
- 41,043 asf is scheduled for Biochemistry program laboratory, shared laboratory support and research office space
- 38,766 asf is scheduled for CISB laboratory, shared laboratory support and research office space
- 37,010 asf is scheduled for Chemical and Bioengineering laboratory, shared laboratory support and research office space
- 3,655 asf is scheduled for Vivarium uses including animal holding, animal support, cage wash area, staff area
- 15,776 asf is scheduled for teaching group classroom, class labs and support space

- 5,810 asf is scheduled for building amenities including dining areas and conference rooms
- 3,695 asf is scheduled for building support spaces

Budget documents submitted with this program show total costs of equipment and furnishings to equal \$7,453,934. This includes equipment costs of \$3.7 million, furnishing costs of \$2.1 million, communication costs of \$1.6 million. The equipment budget will provide for laboratory equipment planned for the building. The furniture budget will provide standard office, classroom, conference room and laboratory furniture. The communication budget will go towards telephone and data infrastructure.

Included within these costs are Information and Technology expenses totaling \$2,046,717. CU has submitted a CC-IT form showing these costs to comply with CCHE budget manual instructions. A large majority of these IT costs are for network equipment and cabling.

Building Functional Uses:

The building will serve as laboratory space, shared laboratory support space, research office space, classrooms, class labs, animal holding, animal support, cage wash areas, staff areas, conference space, building support space and will house amenities such as dining areas for users.

Building Efficiency Factor/Space Utilization:

Although final building efficiencies will be determined in the design process, current plans call for 250,794 gsf and 185,773 asf. This gives the building an efficiency of 74%, which is greater than the 68% required by CCHE for this type of building.

Appropriateness of Funding:

The program plan calls for a total \$22.6 million in capital construction funds exempt (CCFE) and \$90.2 million in cash funding. Given the building largely supports research and academic functions, the requests for state funding are appropriate.

Facility Alternatives:

The institution has identified three facility alternatives to the program plan.

Status quo: Under this option, The Chemical and Biological Engineering Department would be unable to grow faculty, research of PhD students. The CISB would have to cap faculty at the current 5. Momentum of the CISB could be lost.

Forego Programs Intended for the New Building: CISB has contributed positively to Colorado's ability to obtain and create research grants, start-up companies and technology transfer. Terminating the initiative could have negative impacts on CU-Boulder, the biotech industry and economic development.

Cut Back Existing Programs: Cutting back would contradict overarching campus goals to improve faculty productivity and improve relationships with Colorado industry.

For site alternatives, the university also considered main campus sites and an expansion of the existing engineering building. The research park was seen the best site alternative given future

expansion opportunities and strategic goals. Currently, two sites are being considered in the research park for the final building footprint.

Consistency with Institutional Master Plan:

This project is in conformance with the most recently approved Facility Master plan entitled “Campus Master Plan for the University of Colorado at Boulder” approved by CCHE on March 1, 2001.

The program plans relates to several of the goals and objectives of the CU campus master plan including: providing high-quality facilities; preserving traditional campus beauty; using land wisely; designing infrastructure to ensure safety; ensuring widespread involvement; ensuring multi-modal transportation access; and, improving open spaces, outdoor lighting and signage.

Consistency with Institutional 5-Year Capital Improvement Plan Schedule:

The Systems Biotechnology Building is currently campus priority #6 on the University of Colorado five-year capital construction program.

Governing Board Approval:

The University of Colorado Board of Regents approved this program plan on June 6th 2005.

Attachments:

Attachment 1: Project Cost Estimate & Support Information