

**TOPIC:** RECOMMEND APPROVAL OF BACHELOR OF APPLIED SCIENCE  
IN WATER QUALITY AT RED ROCKS COMMUNITY COLLEGE

**PREPARED BY:** DR. IAN MACGILLIVRAY, DIRECTOR OF ACADEMIC AFFAIRS

## **I. SUMMARY**

This consent item recommends approval of Red Rocks Community College's proposed Bachelor of Applied Science (B.A.S.) degree in Water Quality, including a waiver from gtPathways requirements. This is the first proposal from a Colorado Community College System school to offer a baccalaureate degree.

## **II. BACKGROUND**

The Colorado Community College System schools, as well as Aims Community College, received state authorization to propose bachelor of applied science degrees through Senate Bill 14-004, which requires the State Board for Community Colleges and Occupational Education (SBCCOE) to submit to the Commission for its approval technical, career, and workforce development bachelor of applied science degree programs and specifies the criteria to be used in evaluating the request. The states of [Florida](#) and [Texas](#) similarly allow community colleges to offer bachelor of applied science degrees.

Colorado community colleges are required to submit proposals for new degree programs to the Department and staff review the proposed degree for the statutory requirements listed under "Statutory Authority." If the proposal meets the requirements, the proposed degree is recommended for approval by the Commission. If the proposal does not meet the requirements, staff works with the institution.

It is helpful to note the difference between types of degrees. One may think of degrees as falling into one of two buckets: (1) traditional liberal arts & sciences and (2) career and technical education (CTE). Traditional liberal arts & sciences degrees include associate of arts (A.A.), associate of science (A.S.), bachelor of arts (B.A.) and bachelor of science (B.S.) degrees. These degrees usually have a general education core that is broad and typical of the liberal arts & sciences (i.e., written and oral communication, mathematics, arts & humanities, social & behavioral sciences, and natural/physical sciences). In Colorado, the fact that most of these arts & sciences degrees have the gtPathways general education curriculum at their core ensures the transferability of coursework in these degrees for students who switch majors or institutions.

Career and technical education (CTE) degrees, on the other hand, are usually aligned with a specific profession and based on workforce needs, are more "applied," and usually do not have a traditional liberal arts & science general education component. Rather, the general education courses in a CTE degree are usually contextualized within the career. For example, rather than requiring something like "English Comp I," the written communication requirement would be met by something like "Writing for Water Quality Supervision," and rather than "College

Algebra” the mathematics requirement would be met by something like “Math in the Environmental Sciences.” Examples of CTE degrees include associate of applied science (A.A.S.) and bachelor of applied science (B.A.S.) degrees.

Red Rocks Community College’s proposed B.A.S. degree in Water Quality is typical of a CTE degree in that it is an applied degree, students may complete an A.A.S. prior to completing the B.A.S., and it does not require the gtPathways curriculum. Though it does not require or contain gtPathways, transfer is not a concern because the A.A.S. in Water Quality does not contain gtPathways and students who are aware enough of their own career interests to choose this specialized track are unlikely to switch to a different baccalaureate degree.

### **III. STAFF ANALYSIS**

The following information is summarized from the Colorado Community College System’s proposal, and each of the statutory review criteria are addressed within.

#### **1) Data demonstrates workforce and student demand for the degree program.**

- **Water Summit:** A water summit was held in July 2014 with 22 business and industry leaders from the Denver metropolitan area in attendance. This day-long structured group discussion focused on the feasibility and possible design of a bachelor’s prepared entry-level program in water resource, treatment and management. These representatives were instrumental in designing the curriculum to be offered in the BAS degree and provided extensive data concerning the water quality field, workforce demand and employer needs. Many attendees commented that new hires lacked applied and practical skills such as basic sampling and analysis, compliance with laws and regulations, and decision making and problem solving. After course redesign, exit surveys indicated a majority of the summit employers would hire a graduate from the program based on the content.
- **Student Surveys:** During the fall of 2014, 220 student surveys were gathered from both potential and currently enrolled Water Quality Management (WQM) students as well as recent graduates of the Water Quality Management program. The survey results demonstrated demand for the program. About two-thirds (146) of the responses came from degree-seeking students who were in general education classes required for the WQM major. The other third came from students who were either working toward a WQM credential or graduated from the WQM associate of applied science degree program. Fifty-six (38%) of the students in the general education classes indicated some interest in a BAS in WQM and 14 (10%) indicated definite interest in the program. Similarly, sixty-one (92%) of the students enrolled in the associate of applied science degree WQM classes in the fall of 2014 indicated some interest in a BAS in Water Quality and 37 (56%) indicated definite interest. Almost all of the recent WQM program graduates indicated some interest in continuing their studies with 30 (94%) of the graduates surveyed indicating definite interest. More details from the student survey are included in the document titled “A Report on Program Feasibility Research for Students,

Recent Graduates and Local Employers” (on file in the Academic Affairs office at CDHE).

- **Environmental Scan:** Red Rocks Community College also hired Interact Communications, a third-party consultant group, to conduct an environmental scan. Interact completed 45 phone interviews with business and industry representatives with employees ranging from 6 to 187,000 in number. Of those, 67% indicated a need for new employees with water quality training in the future and 33% indicated that they would send their employees for continuing education and retraining.

The results of the business and industry research concluded that the program is feasible as proposed, and that the graduates of the proposed program are, and will continue to be, in demand by relevant businesses and industries in the Denver Metro area, the rest of Colorado, and elsewhere. Overall there appears to be a current and growing market for potential RRCC BAS Water Quality graduates from the perspective of relevant employers, and this is reflected in the data gathered from state and government sources.

**2) The regional and professional accreditation requirements for the degree program, if applicable, have been met.**

This program will require approval by The Higher Learning Commission (HLC). The document titled “BAS Degree Request for Degree Approval and Substantive Change Application” (on file in the Academic Affairs Office at CDHE) provides all of the information required by the HLC. Once approvals are received from the SBCCOE and the Colorado Commission on Higher Education, the BAS Degree Request will be forwarded to the HLC for its review. This process will likely take a minimum of six months and will require a site visit to RRCC.

**3) Providing the degree program within the Community College System is cost-effective for the students and the Community College System.**

The program currently has sufficient resources, equipment and facilities to support the growth of the BAS program. Existing physical laboratory resources have adequate instrumentation and materials for additional upper division laboratory classes. RRCC also has a mobile laboratory that contains all of the necessary sampling and analytical equipment needed for the Environmental Sampling and Containment class to be held offsite. As a result, there will be minimal one-time equipment and start-up costs.

RRCC expects that the BAS program will reach a break-even point within 3 years. Please see the program budget description (Table 1) below for the key assumptions that allow BAS program to obtain sustainability while being cost effective for students. Please note that these budget projections do not include General Education and lower division WQM courses and are reflective of only the upper division WQM classes.

RRCC has sufficient one-time reserves to supplement the BAS program during the initial development phase. The College is prepared to support the program providing funding to meet expected costs that exceed expected revenue during this development without any negative impact to other programs or operations.

**Program Budget Assumptions:**

- **Student Demand:** The initial BAS entry class FTE and Headcount growth percentages were estimated on the basis of those students who expressed a definite intent and interest in the BAS Water Quality degree as determined by the student feasibility study. The enrollment growth projections are validated by past enrollment data from the existing WQM program at RRCC.
- **Program Administration Needs:** A full-time Director will oversee the program and be responsible for initial implementation, development and strengthening of relationships with industry partners and growing the BAS program. The primary responsibilities for this position will be support for the Bachelor of Applied Science degree and 75% of this position's salary and benefit cost is allocated to the upper division program.
- **Faculty and Instructor Needs:** Opening year through year three will have one faculty member assigned to the upper division WQM courses. This faculty will have a 60% teaching, 30% Department duties/Administrative tasks and 10% service work load. The projected salary amount is based on the current faculty base salary, \$46,019, plus an allowance of 30% for benefits. Of the 32 total upper-division WQM credits, 18 of these will be taught by the full-time faculty member and 14 credits will be taught by adjunct instructors. The adjunct instructor costs are based on a rate of approximately \$781 per credit hour plus an allowance of 22% for PERA expenses. Instructor expenses phase-in beginning with Year 2 of the implementation.
- **Career Coaching Needs:** This position would provide workforce information and career assessments to BAS-WQM prospective and current students regarding high demand jobs, employability of BAS-WQM degree, and prospective employer connections. This position would deliver one-on-one student advising and provide in-class training on resume writing, interviewing, and job search skills as well as maintain comprehensive employment resource information through Career Connect (online job listing software), Internships, employer visits and job fairs. This position will work half-time (0.5 FTE) for the BAS water quality program. The salary is calculated at an annual rate of \$48,000 plus an allowance of 30% for benefits.
- **Skills/Lab Technician Needs:** These individuals would assist in the WQM laboratory experiences and generally work 10 hours per week at a rate of \$28 per hour for 32 weeks within the year. During Year 1, staffing is estimated at 5 hours per week at a rate of \$28 per hour for 32 weeks within the year with an allowance of 22% for PERA expenses.

- **Operating Needs:** Estimated operating budget reflects the use of supplies in the classroom and labs.
- **Indirect Costs:** The costs to maintain facilities and all other services integral to the success of the students are represented in the indirect line item in the budget. These include services such as academic advising, library services, tutoring and writing center, IT and technical support, financial aid advising and processing, registration and cashier services, campus security, equipment depreciation and replenishment of laboratory furnishings, facility maintenance, program administrative support, and general business and human resources services to support faculty and staff.

An inflation rate of 2.5% is applied to all revenue and expense items for years two and three.

RRCC State Support (COF & FFS) per credit hour represents the estimated final allocation for FY 2014-2015 through the CCCS allocation formula and is estimated to be flat through the initial three year program implementation.

**Table 1: Program Budget Description**

PROGRAM BUDGET BAS-WQM DEGREE PROGRAM			
	Year 1	Year 2	Year 3
Staffing FTE	2016-2017	2017-2018	2018-2019
Program Director	0.75	0.75	0.75
FT faculty	1	1	1
PT Instructor	0	0.5	0.5
Exempt staff	0.6	0.7	0.7
Student FTE	10.7	30.9	43.9
<b>REVENUE</b>			
Rates per credit hour			
Tuition per credit hour	\$230.00	\$235.75	\$241.64
RRCC State Support (COF & FFS)	\$72.00	\$72.00	\$72.00
Course fee	\$6.75	\$6.92	\$7.09
Program revenue			
Tuition	\$73,830.00	\$218,540.25	\$318,244.82
RRCC State Support (COF & FFS)	\$23,112.00	\$66,744.00	\$94,824.00
Course fee	\$2,166.75	\$6,413.68	\$9,339.79
<b>TOTAL REVENUE</b>	<b>\$99,108.75</b>	<b>\$291,697.93</b>	<b>\$422,408.61</b>
<b>EXPENSE</b>			
Director	\$69,225.00	\$70,955.63	\$72,729.52
FT Faculty	\$59,825.00	\$61,320.63	\$61,320.63
PT instructor	\$0.00	\$13,010.86	\$13,336.13
Career Coach	\$31,200.00	\$31,980.00	\$32,779.50
Skills/Lab technician	\$5,465.60	\$10,931.20	\$11,204.48
Personnel	\$165,715.60	\$188,198.31	\$191,370.25
Operating	\$8,900.00	\$12,905.00	\$19,200.00
Subtotal	\$174,615.60	\$201,103.31	\$210,570.25
Indirect	\$158,741.45	\$182,821.19	\$191,427.50
<b>TOTAL EXPENSE</b>	<b>\$333,357.05</b>	<b>\$383,924.50</b>	<b>\$401,997.75</b>

This comparison of student tuition and fees (Table 2) below illustrates how cost effective the program will be for students. The comparison institutions included here were chosen based on the likelihood that similar student populations are served.

**Table 2: Comparison of Student Tuition and Fees**

COMPARISON OF STUDENT TUITION AND FEES

	<i>Red Rocks Community College</i>			<i>Metropolitan State University of Denver</i>			<i>Adams State University</i>		
	Credits	Rate	Total	Credits	Rate	Total	Credits	Rate	Total
<i>Lower division tuition</i>	88	\$124.90	\$10,991.20	----	----	----	----	----	----
<i>Upper division tuition</i>	32	\$230.00	\$7,360.00	120	\$165.77	\$19,892.40	120	\$172.00	\$20,640.00
<i>Mandatory fees per year</i>	----	\$292.00	\$1,168.00	----	\$1,097.00	\$4,388.00	----	\$2,855.00	\$11,420.00
TOTAL	120		\$19,519.20	120		\$24,280.40	120		\$32,060.00

Assumptions:

1. Resident students, 120 credit hours total for degree, completed in 8 semesters (4 years).
2. For comparison this includes tuition and mandatory fees only effective FY 2014-2015.

The environmental scan completed by Interact Communications identified nine job categories related to the field of water quality and included such categories as Environmental Compliance Officers, Environmental Engineering Technician, and Water Pollution/Environmental Scientists and Specialists. The salary range for new employees in these industries ranged from \$45,000 - \$70,000.

**4) The degree program is sufficiently distinguishable from:**

- (a) an existing degree program at a state four-year institution of higher education that is provided to a student who resides in the community college’s geographic service area, as defined by the Commission pursuant to Section 23-1-109 (2), without the student having to change his or her residence, or
- (b) a degree program that has been successfully offered previously in conjunction with a state four-year institution of higher education, which degree program will be reinstated sooner than the degree program could be offered by the community college.

The program’s external feasibility study assessed existing state and regional programs to determine if they were competitors. No significant competitor for water quality training at a 2- or 4-year institution was found within 500 miles of Lakewood, Colorado (based on degrees and certificates awarded in 2013). Detailed information is provided on page 52 in the RRCC BAS in Water Quality Program Feasibility Research – Phase One Report (on file in the Academic Affairs office at CDHE).

- 5) The degree program could not be provided through a statewide transfer agreement pursuant to Section 23-1-108 (7) with an accredited state four-year institution in the community college’s geographic service area or with an accredited state four-year institution of higher education that has a statewide service area, as defined by the Commission pursuant to Section 23-1-109 (2), that will deliver an existing Bachelor of Applied Science program in the community college’s service area sooner than the degree program could be offered by the community college.**

Two hundred and ten colleges and universities in the US have environmental/environmental health engineering and/or water quality and wastewater treatment management and recycling technology or technician programs. Seventy-three colleges and universities in the US specifically indicate that they have water quality programs. Forty-four of these have Associate Degree-level programs; only 2 offer Bachelor Degrees. The figure below (Fig. 1) shows competitor water quality programs in neighboring states to Colorado.

**Figure 1: Competitor Water Quality Programs in Neighboring States to Colorado**

Competitor Water Quality Programs in Neighboring States to Colorado					
Name of Competitor	Main Campus Location	Driving Distance and Direction from Lakewood, CO	Bachelor Degrees Awarded 2013	Associate Degrees Awarded 2013	<1 to <2-Year Degrees or Certificates Awarded 2013
Red Rocks Community College	Lakewood, Colorado	-	-	63	34
Pikes Peak Community College	Colorado Springs, Colorado	75 miles S	-	1	3
Otero Junior College	La Junta, Colorado	180 miles SE	-	-	-
Casper College	Casper, Wyoming	285 miles NW	-	9	-
San Juan College	Farmington, New Mexico	368 miles SW	-	-	-
Santa Fe College	Santa Fe, New Mexico	396 miles S	-	1	1
Salina Area Technical College	Salina, Kansas	440 miles E	-	-	5
Utah Valley University	Orem, Utah	484 miles W	-	-	1
New Mexico Junior College	Hobbs, New Mexico	584 miles S	-	-	-
New Mexico State University	Las Cruces, New Mexico	619 miles S	-	5	1
Fort Scott Community College	Fort Scott, Kansas	660 miles E	-	2	-
Northland Pioneer College	Holbrook, Arizona	682 miles SW	-	-	-
Gateway Community College	Phoenix, Arizona	816 miles SW	-	-	9
Arizona Western College	Yuma, Arizona	990 miles SW	-	-	-

Source: <http://nces.ed.gov/collegenavigator/>

The two main competitors for this program are 4-year universities, but neither is located within 500 miles of Red Rocks Community College.

Based on Core Population Availability, Potential Market Rating, and Population Base, the overall rating in the external study for the RRCC program versus competitors was the highest possible at Very Positive. Further information is provided in the Executive Summary in the RRCC BAS in Water Quality Program Feasibility Research – Phase One Report (on file in the Academic Affairs office at CDHE).

#### **6) The Best Interests of the State**

In determining whether to approve a bachelor of applied science degree program, the commission shall consider whether the state board has met the criteria set forth above and whether the proposed bachelor of applied science degree program is in the best interests of the state of Colorado. Department staff concludes the criteria above have been sufficiently met. Staff agrees this proposed degree is in the best interests of the state of Colorado. The following paragraph is summarized from RRCC's proposal and describes how the proposed program addresses the needs of the community:

*Denver is a regional hub for governmental/regulatory agencies which employ many people in the water industry. Representatives from those industries were part of the Interact Communications environmental scan. In this study, 45 employer surveys were collected indicating the likelihood of graduates being hired with this degree. Here are some quotations from the report: "...It (BAS program) would likely become not only a supplier of candidates to fill local positions, but also a destination school for job training around the country". In addition it was stated that most of the respondents believe that a potential new hire with the completed coursework proposed in the BAS Water Quality program would be more likely to be able to start at a higher level of employment and would move up more quickly in their industry than those without the training. Additionally it was reported that overall, there appears to be a current and growing market for potential RRCC BAS Water Quality graduates from the perspective of relevant employers, and this is reflected in the data gathered from state and government sources. The Interact Study referenced here is included as an attachment (on file in the Academic Affairs office at CDHE).*

#### **7) Anticipated Systemwide Effects**

In determining whether to approve a bachelor of applied science degree program, the commission may also consult with any state four-year institution of higher education that shares the same geographic service area concerning the proposed degree program to inform the commission of any anticipated systemwide effects of the new degree program. Since every four-year institution's geographic service area is the entire state (per [Commission Policy I, N](#)), every four-year institution was consulted.

Department staff sent this draft agenda item on June 23, 2015 to all public four-year institutions for their feedback. One institution (Western State Colorado University) responded that the proposed program is sufficiently distinguishable from its own programs. The representative from WSCU went on to add this is an “important” program. Faculty at Colorado State University, however, were concerned that RRCC’s application did not do its due diligence and truly capture all existing programs with a potential overlap and that the curriculum is too narrowly focused and that the exclusion of water issues in agriculture is a weakness in the curriculum (see Appendix A). The Colorado Community College System and faculty at RRCC were given the opportunity to respond to CSU faculty’s comments (see Appendix B).

In considering the comments from both CSU and CCCS, Department staff concludes that RRCC met its statutory obligations. The proposed BAS degree at RRCC and the degrees highlighted by CSU faculty for potential encroachment serve different populations and are different degrees. Moreover, community college students, often working adults, tend to be more place bound and would likely not pull up roots to spend time and money to move outside the area where they reside or to commute to Ft. Collins. While systemwide effects are difficult to anticipate, staff concludes the benefits to the state by offering this degree program will probably outweigh any potential negative consequences. Though it is ultimately the purview of a faculty to determine the curriculum for its degrees, the Department encourages systemwide coordination and it may be worthwhile for RRCC and CSU faculty to meet and discuss potential areas for collaboration to help meet state and student needs to the greatest extent possible.

CSU’s last concern was that the proposed BAS does not require gtPathways. Based on the earlier explanation of the difference between traditional liberal arts & science degrees and career and technical education degrees, however, staff recommends this degree be exempt from gtPathways requirements. This will not affect transfer because students will generally complete or transfer out of an associate of applied science (A.A.S.) degree and A.A.S. degrees do not contain gtPathways because they are considered Career and Technical Education (CTE) degrees. The degree is 120 credits and so meets the credit cap.

#### **IV. STAFF RECOMMENDATIONS**

**Staff recommends the Commission approve the Bachelor of Applied Science in Water Quality at Red Rocks Community College including a waiver to be exempt from gtPathways requirements.**

#### **V. STATUTORY AUTHORITY**

**C.R.S. §23-1-125** Commission directive - student bill of rights - degree requirements - implementation of core courses - competency test - prior learning

(1)(a) Students should be able to complete their associate of arts and associate of science degree programs in no more than sixty credit hours or their baccalaureate programs in no more than one hundred twenty credit hours unless there are additional degree requirements recognized by the commission;

(3) Core courses. The department, in consultation with each Colorado public institution of higher education, is directed to outline a plan to implement a core course concept that defines the general education course guidelines for all public institutions of higher education... Individual institutions of higher education shall conform their own core course requirements with the guidelines developed by the department and shall identify the specific courses that meet the general education course guidelines. Any such guidelines developed by the department shall be submitted to the commission for its approval. In creating and adopting the guidelines, the department and the commission, in collaboration with the public institutions of higher education, may make allowances for baccalaureate programs that have additional degree requirements recognized by the commission;

**C.R.S. §23-1-133.** Commission directive - bachelor of applied science degree programs - community colleges – approval

(1) (a) The state board for community colleges and occupational education, referred to in this section as the "state board", shall submit to the commission for its approval technical, career, and workforce development bachelor of applied science degree programs to be offered at one or more community colleges within the state system. The commission shall consider the following criteria in determining whether to approve a bachelor of applied science degree program:

(I) Whether the state board provides data demonstrating workforce and student demand for the degree program;

(II) The regional and professional accreditation requirements for the degree program, if applicable, and whether the college can satisfy those requirements, as appropriate, at both the institutional and program levels;

(III) Whether the state board can demonstrate that providing the degree program within the community college system is cost-effective for the student and the community college system;

(IV) Whether the state board can demonstrate that the degree program is sufficiently distinguishable from:

(A) An existing degree program at a state four-year institution of higher education that is provided to a student who resides in the community college's geographic service area, as defined by the commission pursuant to section 23-1-109 (2), without the student having to change his or her residence; or

(B) A degree program that has been successfully offered previously in conjunction with a state four-year institution of higher education, which degree program will be reinstated sooner than the degree program could be offered by the community college; and

(V) Whether the bachelor of applied science degree program could be provided through a statewide transfer agreement pursuant to section 23-1-108 (7) with an accredited state four-year

institution in the community college's geographic service area or with an accredited state four-year institution of higher education that has a statewide service area, as defined by the commission pursuant to section 23-1-109 (2), that will deliver an existing bachelor of applied science program in the community college's geographic service area sooner than the degree program could be offered by the community college.

(b) In addition, in determining whether to approve a bachelor of applied science degree program, the commission:

(I) Shall consider whether the state board has met the criteria set forth in subparagraphs (I) to (IV) of paragraph (a) of this subsection (1) and whether the proposed bachelor of applied science degree program is in the best interests of the state of Colorado;

(II) Shall consult with the state board and state four-year institutions of higher education concerning whether the collaboration described in subparagraph (V) of paragraph (a) of this subsection (1) is feasible; and

(III) May consult with any state four-year institution of higher education that shares the same geographic service area, as defined by the commission pursuant to section 23-1-109 (2), concerning the proposed degree program to inform the commission of any anticipated systemwide effects of the new degree program.

(2) (a) In determining whether to approve a bachelor of applied science degree program for Aims community college pursuant to section 23-71-102, the commission shall consider the following criteria:

(I) Whether Aims community college provides data demonstrating workforce and student demand for the degree program;

(II) The regional and professional accreditation requirements for the degree program, if applicable, and whether the college can satisfy those requirements, as appropriate, at both the institutional and program levels;

(III) Whether Aims community college can demonstrate that providing the degree program within its service area is cost-effective for the student and Aims community college;

(IV) Whether Aims community college can demonstrate that the degree program is sufficiently distinguishable from:

(A) An existing degree program at a state four-year institution of higher education that is provided to a student who resides in Aims community college's geographic service area, as defined by the commission pursuant to section 23-1-109 (2), without the student having to change his or her residence; or

(B) A degree program that has been successfully offered previously in conjunction with a state

four-year institution of higher education, which degree program will be reinstated sooner than the degree program could be offered by the community college; and

(V) Whether the bachelor of applied science degree program could be provided through a statewide transfer agreement pursuant to section 23-1-108 (7) with an accredited state four-year institution in Aims community college's geographic service area or with an accredited state four-year institution of higher education that has a statewide service area, as defined by the commission pursuant to section 23-1-109 (2), that will deliver an existing bachelor of applied science program in Aims community college's geographic service area sooner than the degree program could be offered by Aims community college.

(b) In addition, in determining whether to approve a bachelor of applied science degree program, the commission:

(I) Shall consider whether Aims community college has met the criteria set forth in subparagraphs (I) to (IV) of paragraph (a) of this subsection (2) and whether the proposed bachelor of applied science degree program is in the best interests of the state of Colorado;

(II) Shall consult with Aims community college and state four-year institutions of higher education concerning whether the collaboration described in subparagraph (V) of paragraph (a) of this subsection (2) is feasible; and

(III) May consult with any state four-year institution of higher education that shares the same geographic service area, as defined by the commission pursuant to section 23-1-109 (2), concerning the proposed degree program to inform the commission of any anticipated systemwide effects of the new degree program.

**APPENDICES:**

Appendix A: Comments from Colorado State University

Appendix B: Response to CSU Comments from Colorado Community College System

### **Appendix A: Comments from Colorado State University**

**From:** Miranda,Rick [mailto:Rick.Miranda@ColoState.EDU]  
**Sent:** Monday, July 27, 2015 3:14 PM  
**To:** Macgillivray, Ian  
**Cc:** Pickering,Kathleen; Miranda,Rick; Duquoin,Kathy  
**Subject:** RE: Academic Council - proposed BAS in Water Quality at Red Rocks Community College

Ian, in response to this we consulted our colleges that had some possible overlaps in curriculum with this proposed program. Several issues emerged that we'd like to point out.

Five colleges had some curricular interest in this program. Of those five, three (Engineering, Natural Resources, and Liberal Arts) do not see concern with overlap with their degree programs. The proposed B.A.S. degree in Water Quality is significantly different from the degrees in engineering, natural resources, and liberal arts, including those focused on water issues.

However we did have some concerns related to degrees offered in Agriculture and in Veterinary Medicine and Biomedical Sciences (CVMBS).

First, we think that the RRCC proposal did not properly identify some of the programs in CVMBS that could be impacted. The RRCC has a very good curriculum focused in water quality management. However, we were surprised that RRCC fails to identify the scope and depth of water quality taught at both CSU and CU. While the website did identify CSU extension and the MS program at CU, Environmental Health degrees at Colorado State/CVMBS are not mentioned. CVMBS considers this program a potential threat/encroachment to both the Environmental Health and Watershed Science degree programs here, depending on how their offering is structured.

The College of Agricultural Science is concerned that a focus "just" on water may create opportunities for individuals to make decisions that do not consider the whole picture. With an estimated 80% of the water controlled by agriculture for food production (and with a growing population) it is imperative that this lack of holistic thinking does not happen. Specifically, water quality education is a potentially overlapping area of training that can be shared by RRCC and CSU given our differential foci. RRCC has long trained water treatment plant operators on a variety of skills essential to professional certification in that field. We do not see an overlap on expanding upon that effort by RRCC.

For these reasons this effort seems to be weak in identifying programs that could be impacted by their offering in the same fashion that CSU would have to do if CSU were offering a new degree; we should strive to maintain rather rigorous standards for this type of documentation.

Finally, the request for a waiver from GTPathways seems inappropriate. This would set an inequitable differential between a bachelor degree from an applied institution and a bachelor from the rest of the public institutions in the state. The nuances involved here would be lost on the end user and could bias a potential customer one way over another. The need to provide that

type and level of additional (and essential) education should rest not solely on the other publics but as well on RRCC if they wish to get into this market.

- Rick

Rick Miranda  
Provost and Executive Vice President  
Colorado State University

**Appendix B: Response to CSU Comments from Colorado Community College System**

The State Board for Community Colleges and Occupational Education has submitted a technical, career and workforce development Bachelor of Applied Science (BAS) program for approval. The proposal addresses the elements required under the statute.

The four-year institutions have been provided the opportunity to comment. Pursuant to CRS 23-1-133, input from the four-year institutions is required on only one issue: whether the BAS could be provided through a statewide transfer agreement with a four-year institution of higher education that will deliver an existing BAS in the community college's geographic service area sooner than the proposed degree program could be offered by RRCC. CRS 23-1-133 (1)(b)(II). The proposed BAS could not.

The Commission has discretion under the statute to consult with any state four-year institutions of higher education that share the same geographic service area to inform the Commission of any anticipated systemwide effects of the new degree program. CRS 23-1-133 (1)(b)(III). This provision enhances the Commission's ability to make decisions against a backdrop of how a proposed program fits with the Commission's master plan. Colorado State University has responded to the request for its input with comments that course offerings in the RRCC Water Quality Management BAS may overlap curriculum in its Environmental Health and Watershed Science degree programs and that RRCC Water Quality Management BAS will present a "potential threat/encroachment" to these degree programs, depending on how RRCC structures its program. Per statute, it is for the Commission to determine whether this is a "systemwide effect" relevant to its consideration.

CSU acknowledges that if it is the intent of the proposed program to expand upon the training RRCC has long been providing to water treatment operators, the program will not overlap to its detriment. RRCC offers the following to demonstrate that its Water Quality Management BAS is designed to expand upon its existing Water Quality Management AAS, and the systemwide effect of its proposed Water Quality Management BAS is positive. The program, as structured, will complement, not present a "potential threat/encroachment", to CSU's Environmental Health and Watershed Science degree programs by providing skilled workers to the water industry.

A key consideration in this issue is the philosophical and structural foundations that differentiate a BAS degree from traditional baccalaureate degrees. These differences are highlighted below.

**I. What is an Applied Baccalaureate Degree (BAS)?**

*"...The applied baccalaureate degree is defined as a bachelor's degree designed to incorporate applied associate courses and degrees ... providing students with the higher-order thinking skills and advanced technical knowledge and skills so desired in today's job market."<sup>1</sup>*

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<sup>1</sup> THE ADULT LEARNER AND THE APPLIED BACCALAUREATE: NATIONAL AND STATE-BY-STATE INVENTORY by Barbara K. Townsend (Center for Community College Research at University of Missouri-Columbia), Debra D. Bragg

Traditional Baccalaureate	Degree program made up of liberal, academic, and professional coursework, providing a selection of courses designed to offer both breadth and specialization to students.	Bachelor of Arts (BA) Bachelor of Science (BS)
Applied Baccalaureate (AB)	Degree program emphasizing applied coursework and applied learning at the upper division or throughout the entire collegiate pathway, which often begins with an applied associate degree.	Bachelor of Applied Science (BAS) Bachelor of Applied Technology (BAT) Bachelor of Technology (BT)

Reference: Office of Community College Research and Leadership (OCCRL).

The pathways between the Associate of Applied Science degree and a traditional baccalaureate (BA or BS) typically have differing general education requirements, as well as upper division course requirements that sometimes do not provide a smooth transition from the applied lower division courses. The BAS degree addresses this issue by recognizing and building on all of the lower division general education and core courses in the Associate of Applied Science degree and continues the applied focus in the upper division courses. From this perspective, the philosophical approach between the degrees is quite different. The most important consideration is that students who complete an AAS degree and then move into a BAS degree should be able to complete their programs on time and with no more than 120 credits. It is not uncommon for students who complete an AAS and then transfer into a traditional baccalaureate degree to need an additional one or two semesters to complete their programs of study. The additional costs for tuition and fees, as well as the opportunity costs of not being able to enter the workforce because of this, are substantial.

The Water Quality Management Bachelor of Applied Science degree provides hands-on, job readiness skills specific to water treatment and wastewater treatment with applications of public health regulations and source water evaluation.

**II. What is it about this BAS that makes it a technical, career and/or workforce BAS and how is this degree designed to fill a different need than a bachelor of science like those referenced by CSU?**

The Water Quality Management BAS focuses on operator training and technical skills required for water treatment. The lower division courses emphasize water treatment and wastewater treatment technical skills, while the upper division courses apply the knowledge learned in the lower division classes. The upper division classes support the study of source water supply treatment and security, drinking water

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(Office of Community College Research and Leadership at University of Illinois at Urbana/Champaign), and Colin Ruud).

regulations for public consumption, and practices and regulations for wastewater discharge. Graduates will be prepared to work directly in water treatment or within a treatment regulatory agency. It does not encompass the broader disciplines required for a Bachelor of Science in Environmental Health or Watershed Management.

**III. How does the proposed Water Quality Management BAS expand on RRCC's current Associate of Applied Science Degree?**

The Water Quality Management Associate of Applied Science degree provides the fundamentals for entry level positions in the water industry. With an AAS, a student is prepared for the entry-level licensing exam and can expect employment in water, wastewater, or industrial waste treatment or related work. The BAS courses are designed to specifically build upon the AAS foundation, teaching skill sets related to utility management and compliance with state and federal regulations. With a BAS degree, a student can expect career advancement in the water treatment industry, or employment in local, state, or federal regulatory agencies that monitor all water treatment practices. RRCC also anticipates that BAS degree holders may find employment related to safe drinking water consulting or related lab work for private or governmental agencies.