SUBJECT: SDSU Cow-Calf Unit – Facility Program Plan

South Dakota State University requests approval of the Facility Design Plan for the SDSU Cow-Calf Unit at an estimated cost of $3,706,000. The Board approved the Preliminary Facility Statement in March 2012. This project is part of the 2012 Ten-Year Capital Project Plan. The funding as approved in the legislation is to be $900,000 from HEFF and the balance of $2,806,000 from bonding to be serviced with private funds, research overhead and sales/services revenues.

The Facility Program Plan includes space for education and research in the areas of beef production, handling, nutrition and breeding. The facilities will enhance undergraduate animal science curricula, expand opportunities and experience for undergraduate, graduate, and faculty research efforts, and improving resources and facilities for workshops, field days, and demonstrations to better serve the mission of education to current produces.

There are a total of three facilities that make up the research and education unit. The main building will be approximately 13,415 square feet to accommodate classrooms, office, laboratory, animal handling, calving and support facilities. A second monoslope building of 17,152 square feet will be used for cow and calf feeding pens and housing. The third facility will be a commodity feed storage and mixing facility at 5,920 square feet. The facilities are to be located on the SDSU Farm Department site north of campus.

The site has been changed from Volga because the site was governed by a wildlife easement that contains limitations in the size and location of sites that can be developed with

(Continued)

RECOMMENDED ACTION OF THE EXECUTIVE DIRECTOR

Approve the SDSU Cow-Calf Unit Facility Program Plan. The project can then move forward for full design. The bond funds will not be available until FY14 so the actual construction cannot begin until after the bond proceeds are available. If approved, and legislation is deemed necessary by SDBA bond counsel, legislation will need to be submitted to amend HB1051 from the 2012 session to allow the facility to be sited north of SDSU on campus property.
buildings. This site change will require a change to the 2012 Ten-Year Capital Plan because the building is sited near Volga in the bill.

Additional program details can be found in the attached Facility Program Plan from SDSU.
FACILITY PROGRAM PLAN
FOR
NEW COW/CALF RESEARCH AND EDUCATION UNIT - VOLGA
SOUTH DAKOTA STATE UNIVERSITY

DATE: November 11, 2012

SDSU requests approval of this Facility Program Plan to continue planning the new Cow/Calf Research and Education Unit.

The Preliminary Facility Statement (PFS) was approved at the March, 2012 Board of Regents meeting.

a. Programmatic justification for discrete spaces
This project will provide the modern facilities required for education and research in the areas of beef production, handling, nutrition, and breeding. The facilities will enhance undergraduate animal science curricula, expanding opportunities and experience for undergraduate, graduate, and faculty research efforts, and improving resources and facilities for workshops, field days, and demonstrations to better serve the mission of education of current producers. A multiple building facility project is planned to achieve these programmatic goals.

Three linked facilities and one separate facility are planned. The main building will provide classroom, office, laboratory, animal handling, calving, and supporting facilities. Calving and animal handling space will be an example of state of the art “bud box” animal handling methods. All main building spaces will be jointly used for academic classes, laboratories, demonstrations, and practical applications of animal handling. The main building will be connected to the monoslope building by a series of holding pens, sorting pens, animal loading alleys & chutes, and alleyways.

A second facility, a monoslope building, will provide semi-enclosed cow and calf feeding pens and housing. The plans include use of an “Instantec” feeding system. This automated air hydraulic feeding system allows animal nutrition trials on very small up to large groups of calves. This provides the opportunity to significantly increase the efficiency and variety of research and teaching trials. It also will allow smaller feeding facilities to be built, since trial group sizes can be reduced.

The third facility will be a commodity feed storage and mixing facility. The combination of bins, tanks, storage spaces, and silos associated with the third facility will allow numerous and varied feeding trials for teaching and research work. The monoslope building, outdoor feed storage facilities, and commodity building will be connected by a
driveway for transferring prepared feed rations from the preparation and mixing areas to
the enclosed animal feeding facilities.

The unlinked facility is a ruminant nutrition and feeding shed. Each of the facilities is
described below.

Main Building
This project will provide the modern facilities required for experiential application of
research and education in fields of beef production, handling, nutrition, and breeding.
The main building will provide enclosed space for demonstration and teaching related to
these fields. It will also be the springboard for access to the remaining facilities. The
program spaces required within this building are as follows:

Main Building – 13,415 sf
Education and Research - 5,165 sf
  Classroom – 1,805 sf
  Seminar/Conference Room – 240 sf
  Laboratory – 320 sf
  Field Office – 166 sf
  Overnight room – 192 sf
  Support spaces – 2,442 sf

Animal Handling and Calving – 8,250 sf
  Working Area - 2,787 sf
  Calving Area – 3,520 sf
  Shop – 1,063 sf
  Wash Rack – 880 sf

The Main Building will be a fully enclosed facility. The education and research spaces
will be heated and air conditioned. The Animal Handling and Calving spaces will be
heated spaces, but not cooled.

Monoslope Building - 17,152 sf
  Feed Alley, Calf Housing & Feeding Pens

The Monoslope Building will be partially enclosed and an unheated building. It is likely
to be enclosed on three sides, and rely on natural ventilation for cooling.

Commodity Storage – 5,920 sf
  Feed Mixing Area – 2,400 sf
  Commodity Storage – 3,520 sf
  Bunker Silos
  Ag Bag Area
  Commodity Bins
The Feed Mixing and Commodity Storage Areas will be fully enclosed space for mixing various types of feed rations, both liquid and solid, including nutritional supplements. Only spaces that contain liquid feeds will have any heating system or temperature control. All other areas will be unheated.

The commodity bins, bunker silos, and ag bag areas are all semi enclosed or unenclosed concrete slabs for storage of bagged feeds, grains, roughage, silage, hay, distiller’s grains, and other commodity feeding supplements and products. These will occupy about 5,000 sf of ground adjacent to the Commodity Storage Building.

**Ruminant Nutrition Facility – 1,800 sf**
A small building will be required for ruminant nutrition research. This facility would be for weaned and mature stock feeding and nutrition trials. It will be a partially enclosed facility.

The buildings will be a combination of enclosed and semi-enclosed structures. Connecting these buildings will be a series of animal runways, holding pens, feeding pens, pastures, driveways, livestock chutes, bunker silos, ag bag slabs, and commodity bins. The developed site area will be 4 to 6 acres in size.

**b. Gross square footage** - The total estimated building space is 38,287 gsf.

The Main Building will have an area of approximately 13,415 gsf. This includes all program areas noted above. Approximately 29% of the gross area of this building will be functional education space.

The Monoslope Building will have an area of approximately 17,152 gsf. This includes all program areas noted above.

The Commodity Storage Building will have an area of approximately 5,920 gsf. This includes the feed mixing area and commodity storage area and will be fully enclosed space. Bunker silos, ag bag areas, and space for commodity bins will occupy additional unenclosed space (approximately 5,000 sf). The enclosed and unenclosed spaces are linked by driveways to provide easy access and loading of feed.

The Ruminant Nutrition Facility will have an area of approximately 1,800 gsf.

**c. Site Analysis**
The consultant and University examined property west and north of Volga, South Dakota. This site includes appropriate utilities and access. Property use is governed by a wildlife easement that contains limitations in the size and location of sites that can be developed with buildings. The University and the civil engineering consultant thoroughly
investigated the limitations and restrictions imposed by the wildlife easement and how it would affect the development of the facilities and future use of the property.

Grazing is a highly compatible use within the strictures of the easement. The property offers excellent opportunities for demonstration of grazing practices that are necessary in areas of environmental concern and where wildlife conservation and ag production is desired. Crop production is forbidden by terms of the wildlife easement. Building structures, livestock pens, and maintained gravel driveways would be limited to specific predetermined locations. Upon further consideration, SDSU chose to seek out an alternative site for development.

The site chosen is SDSU’s Farm Department site north of campus. This site is in the vicinity of existing Beef Breeding Unit facilities and Beef Nutrition facilities. SDSU would combine all bovine teaching and research functions in one vicinity. Cow, calf, and production animal academic and research work would utilize the adjacent sites, each in their necessary facilities. There are no restrictions or covenants to use of this property. It provides superior proximity to campus. The cow-calf facilities may encroach on some available pasture near the other facilities. The Volga site would be retained and provide necessary added pasture areas and excellent research opportunities.

The unit will include open (i.e. pastures & pens), semi-enclosed (i.e. commodity storage, monoslope feeding pens), and fully enclosed (i.e. classroom, maintenance, animal handling, and feed mixing) facilities.

d. Description of key building features
The Main Building will include a classroom for up to 100 occupants. The classroom shall be adjacent to the lobby and also view outside to demonstration cattle pens. The classroom is designed to provide flexible seating arrangements for various classroom and extension education settings. The facility will have a shop area for minor vehicle maintenance and tractor and trailer storage. The calving area within the main building will be fitted with 12 to 16 pens that can be reconfigured for calving, pairing, weening, breeding, and grooming. A small space will be created for overnight stays during calving season. The working area will utilize a “bud box” sorting and penning system for modern demonstration of bovine animal handling methods. This area will be utilized for staging, sorting, animal holding, teaching, vaccinations, and basic animal handling. All activities are associated with the teaching and research functions of the unit.

The Monoslope building is planned for multiple feeding pens, including an Insentec dosage type feeding system with dosage type animal waterers and traditional feeding pens. A feed alley will be adjacent to all pens that is wide enough for tractor and feed wagon access. The semi-enclosed structure will be naturally ventilated, with an adjustable curtain system.
The Commodity Storage building will have a fully enclosed portion that will allow a tractor and feed wagon to pass through the building and mix custom feed mixes.

All facilities will be constructed as wood post frame construction, wood stick framed construction, or premanufactured steel building construction with metal panel walls that are common to agricultural facilities. The types of construction will be evaluated as we develop the design of the facilities further. Building heights will allow tractor and wagon access in numerous locations.

e. Illustrative floor plans
Floor plans of the Main Building, Monoslope Building, and Commodity Storage Facility are attached. The Ruminant Nutrition Facility is a simple shed structure that is 24' x 75' in size and not illustrated. A site plan, showing the functional relationship of the facilities is shown. A perspective drawing of the interior of the Monoslope Building is attached for reference.

f. Initial cost estimates
Estimated project costs for all facilities is $3,699,882. A recapitulation of project costs for the combined project and individual facilities is attached.

g. Impact to M&R
Estimated annual funding for maintenance and repair/capital renewal funding for this type of agricultural production facility should be equal to 1.5% to 2% of the project costs or the building replacement value. The annual M&R allocation should be between $55,498 and $73,998 based on the project costs for the Teaching and Research Facility.

h. Budget for ongoing operational expenses
The facility will be well ventilated and heated, but only classroom and research functions will be cooled. Utility expenses are estimated at $48,000. Utilities will be provided outside of the main campus utility system. Utility costs are not impacted by the WAPA allocation or related secondary electrical suppliers expenses because this building is on Brookings Municipal utilities and the rural electrical system, not on campus central systems.

We estimate routine maintenance expenses for this type of agricultural production facility will be approximately 1.0% to 1.5% of the project costs ($36,999 to $55,498/year). Simplicity of mechanical systems and significant use as an agricultural production facility may reduce this estimated cost.

i. Proposed funding sources for costs of
   a. Construction – Funding will have two sources: HEFF - $900,000. Other funds will be $2,806,000 and will be a combination of private gifts, research grant overhead funding, and Building Authority/debt service from sales/services revenues.
b. Ongoing operations – Agricultural Experiment Station funds and production revenues.
c. Maintenance and repair – Agricultural Experiment Station funds and production revenues.

End of report