

21.3. Physical Facilities and Equipment

21.3.1. Provide a brief description of the major functions of, or activities that take place in the facilities used by the college in fulfilling its mission.

The physical facilities were designed to facilitate the College programs. Specific features of the physical facilities include: 1) the main building was constructed under one roof and provides the facilities to accomplish the major College missions; 2) the Veterinary Teaching Hospital is centrally located within the main building; 3) areas were organized to promote maximum interaction between programs and between individuals; 4) the facilities are functional and flexible; 5) the design allows for future expansion; and 6) the building is attractive. The main building was completed in 1982 and dedicated in 1983. Several modifications and additions to the buildings have been completed. A new 100,000 sq ft research building was completed in 2005.

Buildings located on the CVM campus include the main building, the research building, auxiliary office space ("Annex"), Teaching Animal Unit (TAU) buildings, and the Equine Isolation Unit. One modular structure remains on the CVM campus.

The main building houses the vast majority of the units involved in the educational, clinical service, and research activities of the College. Such units include the administrative offices of the deans, department heads, and their staff; the business office of the College; the veterinary medical library; lecture rooms, conference rooms, and teaching laboratories; faculty, house officer, and graduate student offices; research laboratories; the electron microscopy suite; the Biomedical Communications audiovisual production facility; the hospital and research computer facilities; the cafeteria; and the entire Veterinary Teaching Hospital. The remaining buildings have been specifically designed and located adjacent to the main building to support the missions of the College.

The CVM is currently leasing 4,800 sq ft for research laboratory purposes in Pylon Industrial Park (i.e., Pylon Research Laboratories) at an annual cost of \$103,000.

21.3.2. Provide an area map that indicates the principal facilities of the college and describe distance and travel time to off-campus facilities.

See Appendices 3-1 and 3-2.

NC State University is divided into five Campuses: Centennial Biomedical, North, South, Central and Centennial (see Appendix 3-1). The College of Veterinary Medicine (CVM) campus is located on the Centennial Biomedical Campus, approximately two miles west of the Central Campus of the University. The CVM campus is 181.5 acres, which includes a five-acre lake used for aquatic research, and 20 acres of woods; approximately 100 acres have been reserved for pasturing of animals, and approximately 75 acres have been used or reserved for building sites.

The Wake County Animal Care, Control and Adoption Center is located in the eastern part of Raleigh, NC, approximately 12 miles from the CVM; driving time is 20 minutes.

The Equine Health Center is located in Southern Pines, NC, approximately 60 miles from the main CVM facilities in Raleigh; driving time is 60 minutes.

The Center for Marine Science and Technology (CMAST) is located in Morehead City, NC, about 220 miles or 3.5 hours driving time.

The most commonly used NCSU University Field Laboratories (UFLs; operated by NCSU College of Agriculture and Life Sciences) are located along Lake Wheeler Road, about eight miles from the CVM; driving time is 15 minutes. Other UFLs, or farms owned by other state agencies, are located throughout the state.

21.3.3. Describe the adequacy (pertains to all facilities used by the college whether on-campus or off-campus) of:

21.3.3.a. safety measures in all areas of the college including posted protocols in high-risk areas,

The CVM College safety program is a component of the University wide safety program and is overseen by the College Safety Committee. The program incorporates security, safety plans, safety equipment, radiation safety, rules and procedures, accident/incident reporting, medical surveillance, waste disposal and fire inspection (to list a few examples).

Environmental Health and Safety Center: NCSU has established administrative procedures for the reduction and prevention of on-the-job accidents and illnesses and for the protection of the environment. The Environmental Health and Safety Center (EHSC) administers and implements the occupational health and safety policies and procedures promulgated by EH&S and by University health and safety committees. The EHSC is staffed by professionals in radiation safety, industrial hygiene, occupational safety and environmental management. EHSC activities include providing assistance to members of the University community in evaluating and minimizing risks, the proper disposal of toxic materials, and the maintenance and analysis of records and documentation for regulatory agencies. The EHSC maintains a comprehensive web site with links to the various components of the university's program.

Occupational Health Program: The EHSC is responsible for administration of the NCSU Occupational Health and Safety Program for Personnel with Animal Contact. All employees with animal contact must enroll in the program by completing and submitting a questionnaire. The questionnaire is sent to Student Health Services (SHS), which is responsible for tracking participation and evaluating risks. Paperwork is returned to the employee's supervisor indicating if any additional vaccinations or workplace accommodations are recommended. Employees (personnel who receive a paycheck from NCSU) are covered by this program; this includes nearly all CVM house officers and graduate students. The program for veterinary students deviates from the above as follows. Students are not required to submit a questionnaire to SHS, but do receive, before starting school, information that alerts them to potential hazards in the veterinary curriculum, and advises contacting their own physician, or a SHS physician, with any concerns. In accordance with NCSU policy, course syllabi must contain health and safety-related information.

Safety Training: In-depth training about the specific hazards of the individual's workplace is provided by the supervisor; supervisor's responsibilities are defined on the EHSC web site. The University provides training on protection from radiation hazards, biohazards, and chemical hazards. Completion of a campus-wide radiation safety course is required before investigators are allowed to order radioactive substances; on-line training is also available.

Safety Committee: The Safety Committee is composed of representative employees (faculty and staff) of the different areas of research, teaching, and service of the College. This committee meets once a month to address safety-related issues, resolve and address safety problems, facilitate the communication of safety topics to employees and students, and act as a sounding board for any safety issues of concern. The director of University Life Safety Services or his designee, or both, attends the College Safety Committee meetings, bringing up-to-date information of safety-related issues and information. The Safety Committee members report to their College departments and different services. They bring to the Safety Committee any relevant safety issues that need to be addressed. One member from this committee serves on the University Safety Council.

Security: A key part of the safety measures established at the CVM relates to security for faculty, staff, and students. The foundation for this security involves two main components, the card access system for the CVM main buildings and the fenced perimeter for the Large Animal Hospital. The card access system requires an individual to swipe an identification badge past a scanner to gain entrance to a building or a particular area of a building. The access as identified on the badge is both zone and individual specific. Thus, individuals are limited to where they can gain access on the CVM campus. An established card access committee defines the criteria for the level of access. The Dean and/or his designee approve all requests for badges. Temporary cards may be issued to visitors based on established policy and procedure.

All Main Building and Research Building main entrances and some additional outside doors have card access scanners. There are various internal doors within the CVM as established by the card access committee to limit access to defined groups. Some of the main entrances on the card access system are programmed to be open during normal business hours but these entrances have a receptionist function available to monitor access.

An established perimeter fence limits access to the Large Animal Hospital. Two vehicle gates operate on a pressure plate system and upon vehicle approach open to the Large Animal Hospital during regular business hours. There is a receptionist to greet clients. After regular business hours, the pressure plates are programmed to

not open for vehicles waiting to enter the perimeter. One gate must be opened manually from within the Large Animal Hospital. The other gate can be opened by punching a code into a keypad. The keypad code is provided to a client by the after hours emergency clinician so they may enter the gated perimeter. The pedestrian gates are key access.

In addition to the fenced perimeters, there are specific entry points (doors and breezeway entrances) into the large animal hospital. There are times throughout the year when some of the larger entrances in the Large Animal Hospital must be left open to ensure circulation of air required for quality patient care. Other than these entrances/times, the Large Animal Hospital is locked after hours.

After-hours and on-call faculty and staff are provided with "Emergency Passes" authorizing them to park in the client areas so that the distance they need to walk to the VTH from their car is minimized. In addition, if a faculty or staff member needs to walk to their car in the parking lot after dark, they can call Campus Police, who will provide an escort.

Safety Plans: All College laboratories have approved Safety Plans, which are reviewed by the Environmental Health and Safety Center on an annual basis. The principal investigator or supervisor of each research laboratory is responsible for safety in his/her laboratory or department. This individual must ensure that each person working in his/her area has received the proper training to work in that environment. All the possible hazards that a person may encounter in the laboratory are described in the Safety Plan. The Safety Plan also indicates the safety equipment located within the laboratory, fire prevention guidelines, evacuation plan, chemical spill plans, housekeeping rules, guidelines for handling chemicals and/or hazardous materials, hazardous waste disposal, waste collection policy and storage of chemicals.

Safety Equipment: The main CVM building is equipped with emergency showers and eyewash stations.

Radiation Safety: The CVM works closely with the Environmental Health and Safety center to insure that the College is in compliance with all university and state regulations regarding radiation safety. This includes the establishment of standard operating procedures such as badge monitoring in the Veterinary Teaching Hospital. EHSC conducts quarterly inspections to ensure that departments are following the outlined procedures. If deficiencies are identified corrective action is undertaken.

Rules and Policies: The major departments have established rules and procedures to ensure that a safe environment exists for staff and students. For example, The Veterinary Teaching Hospital has both clinical and administrative rules and procedures to ensure consistency in how the hospital provides a safe working environment. As a specific example, rules relating to infectious disease are established in the Veterinary Teaching Hospital by an Infectious Disease Committee, which reports to the Hospital Board.

Accident/Incidents Reporting: The University has established procedures for reporting accidents and incidents. This enables the identification of trends so corrective action may be taken but also to ensure that proper investigation and follow up occurs should the situation require a workman's compensation process.

Nosocomial Medical Surveillance: The Veterinary Teaching Hospital establishes infectious disease protocols, and conducts medical surveillance to track microbes and to monitor the hospital's cleaning and disinfection techniques as well as identify antibiotic resistant bacteria.

Waste Management: The CVM has established procedures for dealing with waste. Hazardous waste is classified based on defined criteria and disposed of accordingly. Infectious waste is stored in red bags, red carts, or red sharps containers and is disposed of by licensed carriers.

Fire Safety: The CVM works closely with EHSC Fire Protection to insure all requirements are met and all fire safety equipment is functional. This includes monthly inspection of fire extinguishers and regular fire drills.

Research Involving Hazardous Substance Use in Animals: All hazardous agent use in animals is reviewed by the Institutional Animal Care and Use Committee. Protocols that include substance administration are referred to the EHSC for input, and the Director of EHSC is an ex officio member of the IACUC. For new projects involving hazardous agents, a detailed SOP is prepared in consultation with the PI, and EHSC as needed, and approved by the Director of Laboratory Animal Resources.

Biosafety Level 3 (BSL3) Laboratory: A 2,178 sq ft BSL3 Biocontainment Facility is located on the fourth floor of the CVM Research Building. This facility is applicable to analyses and research in which work is done with approved select agents and other pathogens, which may cause serious or potentially lethal disease as a result of exposure by the inhalation route. The design and administration of the certified BSL3 Biocontainment Facility follows strict federal regulations with local oversight provided by the NCSU Institutional Biosafety Committee, a faculty director, and an experienced staff manager. Access to the Facility is restricted and all controlled substance areas are monitored by video cameras.

21.3.3.b. Describe the adequacy of classroom, laboratories and other instructional environments and related equipment,

Laboratories - Teaching:

- Laboratory B104 is used for teaching courses requiring microscopes (pathology, clinical pathology, microbiology, histology, parasitology). Additional microscopes were added when class size was increased from 72 to 76. Virtual microscopy and computing capabilities have also been added to this room.
- The anatomy dissection laboratory has a maximum capacity of 80 students, using current teaching methods. It includes a cadaver storage cooler and freezer, specimen preparation and storage rooms, and a live animal palpation room. Special air handling systems are provided. The floor and walls are designed for ease of cleaning. The location of the live animal palpation laboratory requires large animals (horses, cattle) be brought through the research surgery hallway. Because the flooring is not ideal, carpets are rolled over these floors for animals to walk safely into the laboratory.
- A modular laboratory (D235) provides facilities for teaching physiology, pharmacology, small animal surgery, large animal surgery and several selective courses. The laboratory is partitioned into 14 bays. Each bay is equipped with a ceiling mounted surgery light, medical gas and vacuum lines, physiography distribution station, storage cabinets, a work surface and a surgery table. Sound and closed circuit television systems are available. Surgical scrub sinks are in the center of the laboratory. The laboratory is located near an exit for bringing and removing animals from the laboratory, and is near the Laboratory Animal Resources Unit. In 1992, one-half of the laboratory was remodeled and an adjacent hallway was converted to animal housing quarters. This facility now conforms to MHA standards and allows neutering of animals from the local humane society with subsequent adoption ("Perfect Pet Program"). The ceiling has been replaced since the last accreditation visit to allow cleaning. One bay used for storage in this lab was recently converted to accommodate the new dentistry service.
- A small laboratory (C259) with capacity for 12 people is located adjacent to the Hospital clinical pathology laboratory and is used for instruction of students on the clinical pathology rotation.
- A small 600 sq ft laboratory/amphitheater is adjacent to the necropsy laboratory for gross pathology rounds with seniors, house officers and clinicians.
- A computer laboratory (C260) with 24 workstations is located in the Veterinary Teaching Hospital and is used in multiple core courses and selectives. Computers are on a three-year replacement cycle. There is currently no site with computer facilities that will seat half the veterinary class. The College has upgraded the wireless network to allow connectivity in teaching and common areas (all classrooms, the teaching hospital, commons areas, the cafeteria and the library).

Library: See Section 21.5.

Audiovisual Production: Biomedical Communications is housed in a suite of rooms that are designated for computer graphic design, photography, including film and paper processing, medical illustration, and television production. Two offices are used for administrative and client service activities. The facilities contain state of the art audiovisual equipment and, when supported by the technical and artistic skills of the staff, are capable of producing high quality educational audiovisual material.

Multimedia: Space is designated within the Veterinary Medical library for viewing multimedia programs in the slide-tape, videotape, CD-ROM, and interactive laser disc formats.

Classrooms and Seminar Rooms:

- There are two theater type classrooms, North and South, with a capacity of 96 and 117 persons, respectively. Each room is equipped with fixed writing surfaces and moveable seating. Electrical outlets are provided at each desk. Lighting is controlled from a master panel by the instructor and includes a variety of lighting options. The rooms are acoustically balanced and the public address system is seldom needed, even though one is provided with wired and wireless microphones. The North and South Theaters have networked Macintosh and PC computers linked to the projection systems. Large free-sliding chalkboards fill the front wall of each room. A ceiling mounted projection television can be used for in-room productions with videotapes or cameras; the system is operable from a centrally controlled studio signal. Each room is equipped for individuals with disabilities. The College does not have a room that is large enough for a gathering of the entire student population.
- There are two additional classrooms in the main building: one is a large flat-floored room (D239) with a capacity of 80 individuals. This room can be divided into two equally sized classrooms using a central partition. The second flat floor classroom (D236) has a capacity of 40 persons. Both rooms have the same audiovisual features as the theater-type classrooms. The flat-floor seating arrangement does have the disadvantage of sometimes hampering classroom discussion and student interchange.
- An additional small classroom is located on the first floor of the Research building. It has a capacity of 45 individuals.
- There are 11 conference/seminar rooms throughout the main building (A231, B222, B224, C221, D214, F253,) and research building (R294, R394, R494, R256, R356 and R458). These provide a capacity range of 10-30 persons for small group teaching or individual discussions. In addition, the library has five rooms with 4-person capacity (A 104, 105, 106, 107 and 108) and one with 15 seats (A103).
- Several of the rooms have been configured for interaction with students at distant locations. D239, D236 and A103 have cameras and screens for meeting participants to see and be seen by class or conference participants at other locations.

Computers: Six rooms within the main building have been designated for computing resources, including one office for computer personnel (C101); one environmentally controlled room (C290) that houses ten production level servers, a second smaller server room (D333) housing two servers supporting the Center for Chemical Toxicology Research and Pharmacokinetics (CCTRP) and the FARAD databank, a classroom for computer-based instruction/student lab (C260), a work study/computer lab within the library (A109) and a graduate student work study/computer lab (B104F). Computer laboratories with 24-hour key-card access include the student computer lab (C260) and the graduate student computer lab (B104). One room in the research building (R222) has been designated as a Disaster Recovery server room housing two production level servers, a two terabyte raid array and a four terabyte Network Attached Storage (NAS). Additionally, there are sixteen strategically located telecommunication closets for network connectivity throughout the main building and research building connecting to the University's network infrastructure via redundant fiber. Five outlying buildings are also connected via fiber to the network infrastructure including the Teaching Animal Unit (TAU) providing IP/Web Cam coverage within the animal stalls. Two additional outlying buildings are connected via wireless bridges. The main building has 100% 802.11G & 802.11A wireless coverage deployed via seventy-four access points. The research building has 75% wireless coverage. The Teaching Hospital is equipped with 290 desktop computers and 40 printers. Each desktop is configured to access the Hospital Information System (UVIS), the Clinical & Diagnostic Laboratory System (UVIS/LABS) and the Radiology Information System (RIS) that front ends the DICOM Based Image Management System (AMICAS).

21.3.3.c. Describe the adequacy of teaching hospital(s), pharmacy, diagnostic imaging, diagnostic support services, isolation facilities, intensive/critical care, necropsy, and related equipment.

The Veterinary Teaching Hospital (VTH): The VTH, at approximately 75,000 sq ft, is currently adequate in meeting the College's defined missions of clinical service, teaching, and clinical research. However, the caseload has grown dramatically over the past 20 years and the hospital is at its operational capacity, especially for

companion animals and horses. To address these important space issues, the CVM is in the final planning stages for a new companion animal veterinary medical center (see Section 21.3.5).

To address operational capacity issues for equine patients, the VTH has expanded its isolation facilities from three units to seven units, has converted a limited number of food animal stalls to equine stalls (as the demand for inpatient food animal services has declined), and is in the process of converting a small animal radiation room to an equine clinical area. In addition, some equine services (podiatry, theriogenology, and to a lesser extent, equine ophthalmology) have shifted a portion of their clinical activities to the Equine Health Center at Southern Pines since a large number of their equine patients are located in the Sandhills region of North Carolina.

Pharmacy: The pharmacy is adequate in size (1,147 sq ft) and well located in the center of the VTH, proximate to both the companion animal and large animal hospitals. Three full-time registered pharmacists, two part-time pharmacists, two full-time registered pharmacy technicians, and several part-time clerks are employed. The pharmacy is fully licensed by the North Carolina Board of Pharmacy and the NC Department of Human Resources Regulatory Drug Control and the Federal Drug Enforcement Authority. There is after-hours access, limited by proximity card assigned to the house officer on emergency duty, which is monitored by our security service. The pharmacy utilizes a unit dose approach to providing service insuring that medications are administered in a professional and efficient manner. In addition, there is a 2,000 line item formulary with services including 24-hour controlled substance dispensing module, sterile intravenous admixture service, oncology admixture service, nutrition support service, clinical drug research services, computerized patient medication profiles for inpatients and outpatients and a 140-volume drug information library. This pharmacy also actively precepts pharmacy students from the three North Carolina pharmacy schools during the 4th year of pharmacy education.

Diagnostic Imaging: The imaging center occupies approximately 4,700 sq ft. The following rooms are contained therein: front desk area (reception), transcription office, radiology supervisor's office, conference/rounds room, a film/image viewing room, darkroom, ultrasound room, three radiography suites, one radiography/fluoroscopy suite, digital catheterization laboratory, nuclear imaging, computed tomography, and radiation therapy. There is one radiology supervisor, four radiologists with clinical responsibilities, four residents, seven technologists, three animal technicians, and one medical transcriptionist.

The radiology service is currently one hundred percent digital enabling real time images to be viewed at any computer located in the CVM but film is still available should the need arise. The radiology service has a well developed radiology information system (RIS) which provides for easy ordering of procedures, monitoring of procedure status, and archiving of images. The RIS works with the Picture Archival Communications System (PACS) so that clinicians can store and retrieve images in an efficient manner.

The University leases out 4800 sq ft of space adjacent to our Imaging Center to the IAMS Company, who operate a state-of-art, MRI center (1.5 tesla magnet) dedicated to veterinary patients. The center opened in August 2004 and is providing imaging services to the Veterinary Teaching Hospital for small animal and equine patients and researchers and regional veterinarians. Student involvement with the IAMS Center is substantial and includes opportunity for attendance and observations for VTH hospital patients needing MR imaging, and a one-half day rotation in the center during the 2-week radiology block. The students review an MRI safety video, which details the important safety issues associated with this technology. MR images, reports and a search function are available throughout the hospital in web format for review from any computer. Similarly, house officers have access to the suite and readily interact with imaging personnel. Radiology residents review cases daily with the duty radiologist and the IAMS suite is pivotal in their experience of MR imaging. Without this resource, radiology residents would need to do an externship to get the necessary exposure to MR. Every two weeks MRI rounds are held in the IAMS conference room. This is usually attended by radiologists, neurologists and radiology and neurology residents and the IAMS imaging personnel.

Clinical Pathology Laboratory: The clinical pathology laboratory occupies 1,176 sq ft, and employs seven full-time medical technologists and six part-time emergency/after-hours laboratory technicians. Clinical Pathology is primarily a teaching/service laboratory providing clinical laboratory testing (urinalysis, cytology, routine chemistries, hematology, blood bank, parasitology, and coagulation) for client cases in the VTH, and research cases in the CVM. The laboratory serves as a central receiving area for all "send-out" tests, i.e., tests that must be delivered to reference labs outside the VTH. Routinely, samples for 160 different tests are sent to at least 45 reference laboratories.

Clinical Microbiology Laboratory: The clinical microbiology laboratory consists of one main laboratory area (approximately 400 sq ft) and one shared preparation/autoclave room. Its primary goal is to aid in the diagnosis of diseases caused by bacteria and fungi in patients of the VTH. It also accepts samples from Laboratory Animal Resources, individual researchers, and outside veterinary practitioners. The laboratory is staffed by two full-time medical technologists who oversee its daily operations, and whom are directed by a DVM, PhD microbiologist. All members of the staff routinely consult with clinical faculty and students regarding microbiological problems.

The clinical microbiology laboratory additionally coordinates the routine nosocomial sampling program of the Hospital and maintains information about antimicrobial-resistant bacteria cultured from Hospital patients. The benefit of this program has been the availability of information regarding resistant organisms for immediate nosocomial control.

Clinical Pharmacology Laboratory: The clinical pharmacology laboratory is a 319 sq ft laboratory unit staffed part-time by a medical technologist responsible for the daily operations of the laboratory, under the direction of a board-certified clinical pharmacologist. The laboratory utilizes fluorescence polarization immunoassay and UV spectroscopy to measure drugs and hormones in blood or plasma of animal patients. Additionally, the laboratory provides pharmacokinetic analysis and interpretation, and individual patient consultation in a wide variety of animal species, both within the VTH and to regional veterinarians.

Histopathology Laboratory: The histopathology laboratory occupies a 1,250 sq ft unit laboratory and is staffed by 4.5 FTE histologists and one clerk. Services include routine paraffin and soft tissue plastic processing, embedding and sectioning of decalcified and nondecalcified biomaterial/bone specimens, specialized frozen sections, immunohistochemistry, enzyme histochemistry and nonradioactive in-situ hybridization

Intensive Care Unit: The new Small Animal Intensive Care Unit (ICU) opened in 2006. The 800 sq ft area is directed by a staff supervisor in conjunction with two faculty members from the Department of Clinical Sciences, and is staffed by six full time registered veterinary technicians and five full time veterinary assistants. The veterinary technicians provide 24-hour care, 365 days a year. This service not only provides a major learning experience for interns but provides a unique opportunity to study methods of diagnosis and care of painful or critically ill animals. The unit contains four oxygen/environmental control cages, ten electrocardiogram/direct blood pressure monitors, three ventilators, a defibrillator/pacing unit, an indirect blood pressure monitor, numerous fluid administration pumps, a peritoneal dialysis unit, and other equipment. The equine hospital does not have an area solely dedicated to critically ill horses, rather they are managed in specially upfitted stalls in a single aisle of the large animal hospital.

Necropsy Laboratory: The necropsy laboratory occupies 1,725 sq ft and contains one hydraulic and three stationary stainless steel tables. In addition there is a 90 sq ft photography room; two 90 sq ft offices with microscope, desks and computer; two connected walk-in coolers (1,020 sq ft) for holding animal carcasses and disposable refuse, a 600 sq ft amphitheater, and 520 sq ft of adjacent locker rooms with showers and lavatories for men and women.

Equipment for these and all services within the VTH are prioritized and purchased annually through a through a well developed process administered by the Hospital Board. In addition, the Hospital utilizes a funded depreciation approach to set monies aside for the replacement of older equipment.

21.3.3.d. Describe the facilities for maintenance of teaching and research animals,

The NCSU CVM is accredited by the Association for the Assessment and Accreditation of Laboratory Animal Care International (AAALAC). The CVM Laboratory Animal Resources (LAR) unit is an administratively centralized service unit with husbandry, veterinary care, and oversight responsibilities for research and teaching animals at the CVM. LAR directly manages animal holding facilities in one wing (F-section) of the main CVM building, plus 12 adjacent buildings (five "Finger Barns," the Hog Barn, Turkey Barn, Fish Facility I, Dog Facilities I, II, and III, and the Research Building Vivarium), and approximately 20 acres of pasture.

The Central Procedures Laboratory (CPL) is located in the D-section of the CVM building. The CPL is a fully equipped experimental surgery unit with operating rooms for small and large animal surgery and associated support areas. It has specialized experimental rooms for short-term use, controlled environment rooms, and radiographic services for research projects.

The Teaching Animal Unit (TAU), located adjacent to LAR outbuildings and comprising much of the CVM campus, has been designed and is operated to provide veterinary students with live large animal laboratory learning experiences. The TAU program includes horses, cattle (both beef and dairy), swine, poultry, sheep, goats, and a pair of llamas, maintained in herds and flocks similar to agricultural production units.

The Equine Health Center (EHC), located in Southern Pines, NC, has a number of functions within the CVM, including CEM import quarantine, equine reproduction, ophthalmology, podiatry and rehabilitation, diagnostic testing services, and a remote site for equine research animal donations (“Homeless Horse” program).

Fish Facility II houses a variety of fish and invertebrate species, the majority of which are ornamental (pets and display species). Areas of research focus include: pharmacokinetics, analgesia and anesthesia, surgery, infectious diseases, clinical trials involving new drugs and compounds, and nutritional studies.

The Oyster Barn was so-named because it started as an invertebrate facility, primarily for fresh water mollusks; there are now IACUC-approved protocols for housing small numbers of fish.

The Wild Bird Center is a small facility on the CVM campus used twice a year for 1-2 week “raptor labs.”

CVM faculty participate in collaborative research projects which involve animals maintained at the NCSU University Field Laboratories (UFL) in Raleigh and throughout the state. In each of these cases, animals are owned by the UFL/College of Agriculture and Life Sciences. CVM faculty provide clinical care for most of these units, and students may visit them as part of senior rotations.

The CVM VTH is occasionally utilized for clinical or emergency procedures in research animals, and there are approved protocols for teaching use of large animals in the large animal clinic, and research projects that utilize the imaging facilities. A number of clinical trials utilizing patient animals are conducted in the VTH, and there is currently one dog maintained in the VTH for teaching purposes.

Most of the surgical training for veterinary students is through the “Perfect Pet” program, in which shelter/rescue group dogs and cats are neutered in the CVM Clinical Skills Laboratory (D235), under supervision of CVM faculty. The Clinical Skills Lab is used for student surgery classes, as well as a number of other teaching activities involving animals.

Animal holding areas have been generally adequate in quantity and quality to meet needs for research and teaching animal use, with some qualification as noted below. The new Research Building Vivarium, which opened in early 2006, is an outstanding facility that provides state-of-the-art housing for a variety of species, although focused on rodents.

Heating, ventilation, and air conditioning (HVAC) systems of the entire CVM are undergoing major refurbishing that will continue for the next several years. The LAR Main Building facility is currently under renovation, and plans are in progress for similar HVAC work in the LAR Finger Barns. These upgrades will substantially improve temperature and humidity control in animal holding rooms, and add emergency back-up power for the HVAC systems.

There has been a continual struggle to keep up with recurring problems of peeling/chipping paint in some animal rooms. Much of this problem is attributed to poor moisture control within buildings, and will be addressed as part of the HVAC renovation projects.

LAR “outbuildings” (i.e., the small animal housing facilities other than the Main Building, Finger Barns and Research Building Vivarium) are generally adequate to accomplish their intended purpose, but do have aging systems that will deteriorate over time. We have approval for an extensive renovation of the Hog Barn, which will be completed this Fall, and are in the planning stages for HVAC upgrades to Dog Facilities I and II. Future CVM planning efforts will address long-term animal housing needs currently accommodated in these buildings.

The quantity of pasture space will decline with continued development of the Centennial Biomedical Campus and addition of the new small animal medical center; lost pasture space will impact research animal housing and the TAU, as well as the VTH. The CVM will maintain an active planning committee to recommend ways to optimize use of existing pasture space and plan for these trends. Much of the decline in pasture space may be offset by acquisition of land adjacent to the existing CVM footprint.

21.3.3.e. Describe the adequacy of research facilities and equipment,

Research laboratory space is distributed along department lines. A portion of the research laboratory space was reserved and equipped to create a Central Research Facility that would promote efficient and economical use of specialized equipment and space. The research laboratory space is excellent and well equipped; however, growth in the research programs and newly implemented safety regulations that prevent use of hallways for equipment, e.g., ultrafreezers, have exacerbated our shortage of space. The ultra low freezers that were kept in the hallways of the CVM were moved to the rear of one of our Laboratory Animal Resources (LAR) animal holding facilities, but there are plans in progress to return this space shortly to animal housing. The College leases 4,800 sq ft in the Pylon Industrial Park and will continue to utilize this location for research and office space..

A new four-level research building (100,000 sq ft) was dedicated in 2005. The first level is dedicated to an animal care area and mechanical space. The second level is dedicated to respiratory, allergy and cell biology research. The third level is dedicated to genomics and cancer biology research. The fourth level is dedicated to infectious disease and immunology research. This level also houses two Biosafety Level 3 (BSL3) laboratories (see above).

A complete listing of CVM equipment will be available for review on-site.

21.3.3.f. Describe the adequacy of administrative and faculty offices

Administrative Offices: The administrative suites contain the offices of the Dean, the three Associate Deans, the three Department Heads, and their support staff. Adjacent to these areas is the College Business Office. These offices are well situated and equipped with state of the art communication systems (telephone, facsimile, and networked computer systems).

Faculty Offices: In the main building there are 84 rooms designated for faculty offices that average 120 sq ft each. The new research building has 36 faculty offices. All offices have windows and modular furniture. All offices are carpeted. Research associates, graduate students, and some of the house officers are officed in groups of eight. A portion of the student laboratory (B 104 South end) was converted in 1999 to provide office space for residents and graduate students. The need for office space was underestimated when the main building was constructed. Therefore, additional office space for faculty, house officers and graduate students led to construction of the Annex and leasing of the Pylon Drive Research Laboratories. Despite these improvements, available office space remains insufficient to accommodate visiting scientists, emeriti professors, adjunct professors, house officers, graduate students, and certain support personnel performing key operational duties. No offices are available for new tenure-track faculty, except on a shared basis. Temperature control is a problem in many areas of the College, including offices.

21.3.3.g. Describe the adequacy of service areas for students (for example, lounges, cafeteria, etc.)

Locker space needs were underestimated when the main building was constructed. Therefore, additional lockers have been purchased and installed in the various hallways of the main building. Students do not have convenient facilities for changing clothes, cleaning work boots, and storage of personal items. Since the last accreditation visit, a student locker area has been added in the first barn for student use before Teaching Animal Unit classes. The two commons areas (Blue and Green Commons) were recently upgraded with new carpet, new furniture (including comfortable chairs with pull-out tables for notes or computers) and improved wireless access. Tables and chairs were also added to the patios. One room in the main building has been designated for the SCAVMA office and an additional room in the library has been designated for SAVMA Symposium planning. Numerous large lockers have also been purchased for use by student clubs.

21.3.3.h. Describe the adequacy of building infrastructure (for example, air handling, vented hoods, etc.).

The CVM campus includes a number of buildings of various ages and construction types. The adequacy of each building for its current use varies considerably from state-of-the art to barely adequate. There are a number of efforts underway to address buildings with serious defects.

CVM Main Building: The main building is approximately 300,000 sq ft and was completed in 1982. The air handling and electrical systems are outdated and much of the building infrastructure is beyond its useful life. Consequently, a \$15 million dollar HVAC and electrical renovation is currently underway to upgrade these systems with a targeted completion Summer of 2007. The renovations will include increased normal and emergency power capacity, increased ventilation and exhaust rates, digital environmental controls, duct cleaning and automatic fire sprinkler system. The renovation includes upgrading Laboratory Animal Resources and other animal holding areas to meet AAALAC standards. The main building has adequate exhaust for critical areas such as chemical fumehoods, autoclaves, pharmacy, necropsy, anatomy, etc.

CVM Research Building: This 100,000 sq ft facility is brand new and is state-of-the-art for all systems.

CVM Finger Barns: The Finger Barns house part of Laboratory Animal Resources and include holding areas for research animals such as horses, cattle, dogs, cats, birds, pigs, rodents, and fish. These facilities are out of date for their current use and their infrastructure is aged.

CVM Energy Plant and Utility Tunnel: The main building and the new Research Building are served by a central energy plant which generates high-pressure steam and chilled water. These utilities are supplied through a large underground, fully walkable tunnel. The tunnel and associated utilities were completed in 2004 and are sized to accommodate the full campus build-out as shown on the current master plan. The energy plant has redundant boilers and chillers to provide continuous and reliable operation.

Equine Health Center at Southern Pines: This facility is 4,883 sq ft and was completed in the early 1970s. It includes offices, a research lab, an equine treatment room, an equine surgery, four buildings for research animal housing and adjoining pastures. Recent improvements have been made to increase the number of pastures and efforts are underway to secure funding for building infrastructure improvements.

Pylon Industrial Park: The CVM leases 4,800 sq ft of space at Pylon Industrial Park for research laboratories. These labs are located less than 1 mile from the main CVM campus. Building infrastructure is sufficient and is maintained by the lessor.

Other Facilities: Other facilities on the CVM campus include the Administrative Annex, Teaching Animal Unit buildings, outlying Laboratory Animal Resources buildings, and a modular building for supplemental office space.

21.3.4. For safety and educational purposes, protocols must be posted in the isolation facilities and the facilities must be used for instruction in isolation procedures (biocontainment).

There are protocols regarding biocontainment and management of infectious disease outlined in the Infectious Disease Manual, which is available online for students, faculty and staff to access at any time. In addition, an Infectious Disease Committee reviews these protocols and makes recommendations to the Hospital Board. Prior to working in the VTH, all individuals must complete and pass an Infectious Disease Test, which covers the material in the infectious disease manual. There are specific isolation facilities for small and large animal patients.

Small Animal: The small animal isolation unit is located between the ICU and small animal emergency service and its use has increased with the implementation of the small animal emergency service. The layout of the unit is less than ideal, as it does not lend itself to easy monitoring or segregation of patients. This is one of the units that will be expanded in the planned new small animal hospital so that each patient will have its own isolated cage, allowing four patients to be housed at once. Protocols for use of this room are prominently displayed on the entry door.

Large Animal: The isolation unit (IU) is separate from the hospital, and consists of seven stalls each having its own anteroom for supplies, equipment, and changing. Three of the stalls were built in 2003, and are utilized prior to the four stalls (two pairs of two stalls) that were part of the original infrastructure. There are specific criteria for immediate admission of an animal to the IU, for transferring hospitalized animals to the IU, and for use of the IU. One of the older IU stalls has a head gate and bars for handling a bovine. Protocols for use of these units are prominently posted on each entry door.

21.3.5. Describe current plans for improvement.

The Randall B. Terry Jr. Companion Animal Veterinary Medical Center: The most substantial near-term facility change for the CVM will be completion of the Randall B. Terry Jr. Companion Animal Medical Center (Terry Center). The Terry Center will be 105,000 sq ft (approximately twice the size of the current small animal teaching hospital) and will enhance our faculty and staff's ability to teach professional students and house officers, provide clinical service and conduct clinical research. Highlights of the plans include a separate and specifically designed pavilion for each specialty service (each with instructional space for students and house officers in the form of large conference rooms), an expanded and more usable isolation unit, additional cage capacity, and more storage space. In addition, state of the art technology will be incorporated into the Terry Center to insure that the patients receive the highest quality and most advanced veterinary medical care. Forty faculty offices and cubicle space for 35 house officers are planned. The programming and design development phase for the Terry Center has recently been completed, and the documentation phase (generation of construction documents) begins January 2007. Pending final funding approval, groundbreaking is anticipated for early 2008 and the Center is scheduled to open late 2009. In addition to construction of the Terry Center, the project includes designing a new Campus "Hearth" with a new College entrance, ample open space with large outdoor gathering areas and outdoor "classroom" spaces, a campus walking path, Coffee Shop, re-routing of William Moore Drive, and the construction of a 550-car parking garage. The budget for this comprehensive project is projected at \$72 million.

Existing Companion Animal Hospital Renovation: Relocation of most small animal specialty services to the Terry Center will vacate approximately 50,000 sq ft of existing hospital space. The programming phase for the current small animal hospital is planned for early 2007. The CVM anticipates it will use this space to develop a companion animal "Outpatient Center" including exotics/special species, behavior, dentistry, small animal reproduction, nutrition and an expanded wellness clinic. Renovations will also likely include additional instructional space including a 110-seat classroom, conference rooms for small group learning, and cubicle space for large animal house officers. The CVM Clinical Pathology Laboratories will also be expanded to handle the anticipated volume increase.

Large Animal Hospital: The Campus master plan includes construction of a new 52,000 sq ft Equine Medical Center on the north end of the campus, followed by renovation of the existing large animal hospital to a food animal disease investigation center. Private fund raising for both of these projects is planned, but a timeline for procurement of these funds is uncertain. As a result, the College is exploring options to expand our large animal hospital over the next five years as an interim step. Planning efforts for this expansion are set to begin in Summer 2007.

Main CVM Building: The main building is currently undergoing a \$15 million HVAC and electrical renovation which is scheduled to be complete in Summer 2007 (see section 21.3.3.h). The main building also recently activated a wireless network allowing wireless access to the campus Ethernet system and the web.

CVM Finger Barns: A \$4 million project to renovate the HVAC and electrical systems in the Finger Barns is currently in design and is targeted to begin construction in 2007. The project will include new air handling systems to comply with AAALAC environmental standards. Also included is a new emergency generator to provide 100% electrical back-up and improvement to interior finishes for easier cleaning.

Campus Infrastructure: An \$8 million campus infrastructure project is currently in design to support the new companion animal hospital and provide for additional campus growth opportunities. This project includes additional boilers and chiller in the energy plant, a new sanitary sewer main to the City of Raleigh system, additional campus electrical capacity from Progress Energy, and new underground utilities.

Additional Campus Growth: Planning is underway for a new 75,000 sq ft "partnering" building. The partner building will provide additional opportunities for collaborative relationships with private enterprise under the Centennial Campus model. Preliminary discussions are taking place with state officials of the possibility of locating a new 200,000 sq ft State Health Laboratory Building, which if realized would provide exciting collaborative opportunities for our faculty, house officers, and students.