3 THE PROPOSED ACTION AND THE NO-ACTION ALTERNATIVE

3.1 PROPOSED ACTION

The Proposed Action is continued and enhanced operation of the APS facility at ANL-E (Figure 3.1). This action includes continued and evolving operations of the facility. Evolving operations include construction and operation of an additional experimental unit, a Center for Nanoscale Materials (CNM).

Construction of the APS was completed in 1996. DOE's report *Environmental Assessment, Proposed 7-GeV Advanced Photon Source* (DOE 1990) addressed the construction and operation of the APS. The APS has subsequently undergone minor modifications, including the expansion of the utilities building, construction of new beamlines and laboratory office modules (LOMs), and the establishment of a laboratory for working with biohazards.

3.1.1 Continued Operations

The APS is a third-generation synchrotron-radiation light source research facility at ANL-E (Figure 3.2). High-brilliance x-ray beams from the APS are used for research in numerous scientific fields, including biology, chemistry, physics, geology, materials science, nuclear science, and others. Under the Proposed Action and the No-Action Alternative, ongoing activities related to the operation and use of the APS would continue into the foreseeable future.

Operation of the APS entails the production of electron pulses that can be raised to an energy of 650 MeV, with a typical energy of 325 MeV in the linear accelerator. Electron energies are raised to 7 GeV as they are accelerated by electrical fields in the booster synchrotron. Following injection into the storage ring (3,622 ft [1,104 m] in circumference), the beam of electrons orbits the ring within a system of vacuum chambers and is guided and focused by electromagnets. The beam emits synchrotron radiation as it orbits the ring more than 271,000 times per second.

The storage ring is organized into 35 sectors, each of which is equipped to provide insertion device radiation and bending magnet radiation. Radiation is produced in the form of x-ray beams that can be focused onto a target. Insertion device magnets and bending magnets are placed along the storage ring within each of the 35 sectors, creating 70 beamlines. Each sector is operated by a user team called a Collaborative Access Team (CAT). Beamlines are designed by the team to access radiation from the APS storage ring and are engineered to meet specific experimental needs; a variety of optical devices are used to adjust and focus the x-ray beam. Experiment stations and associated beamlines are constructed in the experiment hall. Assembled within the experiment station are detectors, equipment for analysis and characterization, and the

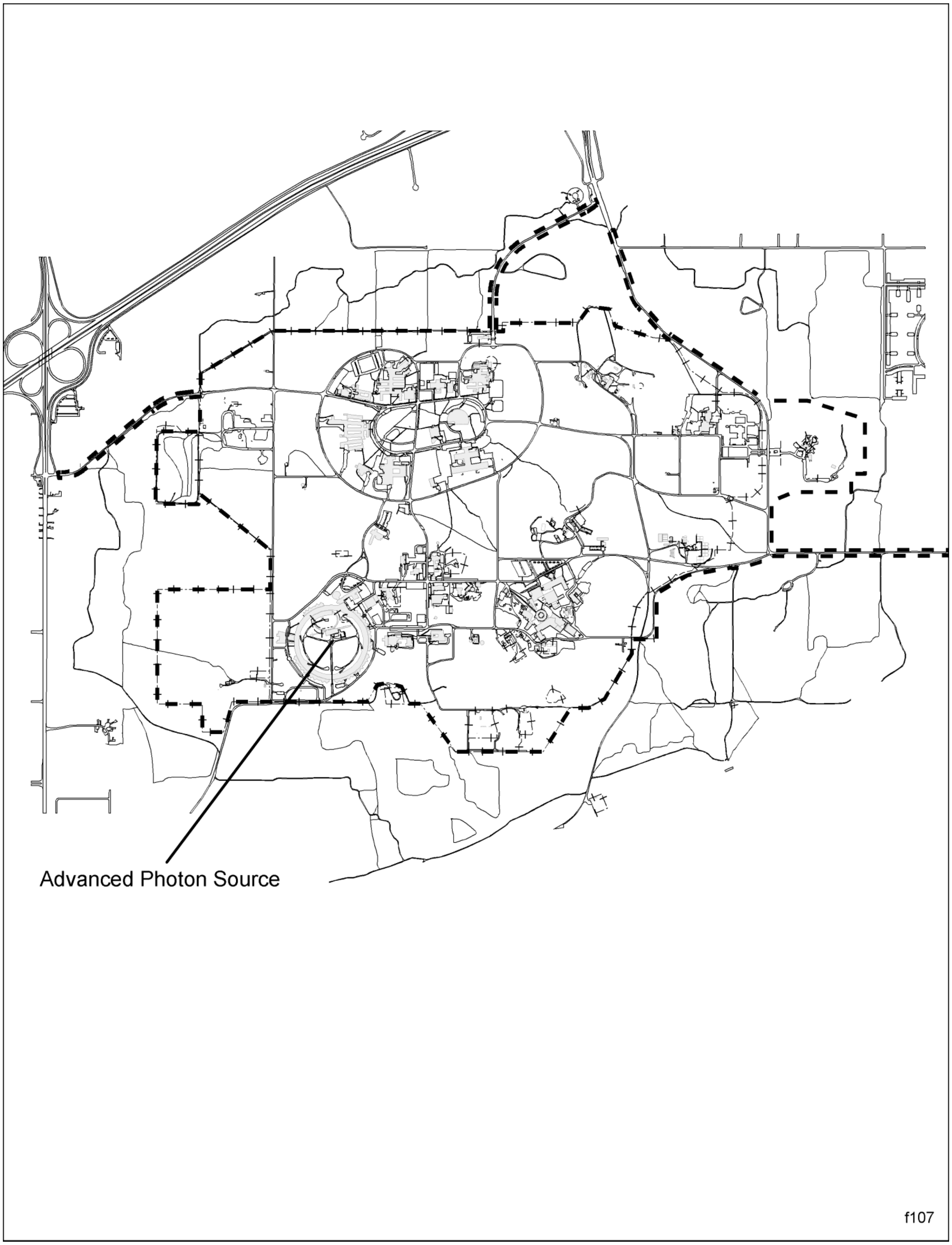

FIGURE 3.1 Location of the Advanced Photon Source at Argonne National Laboratory-East

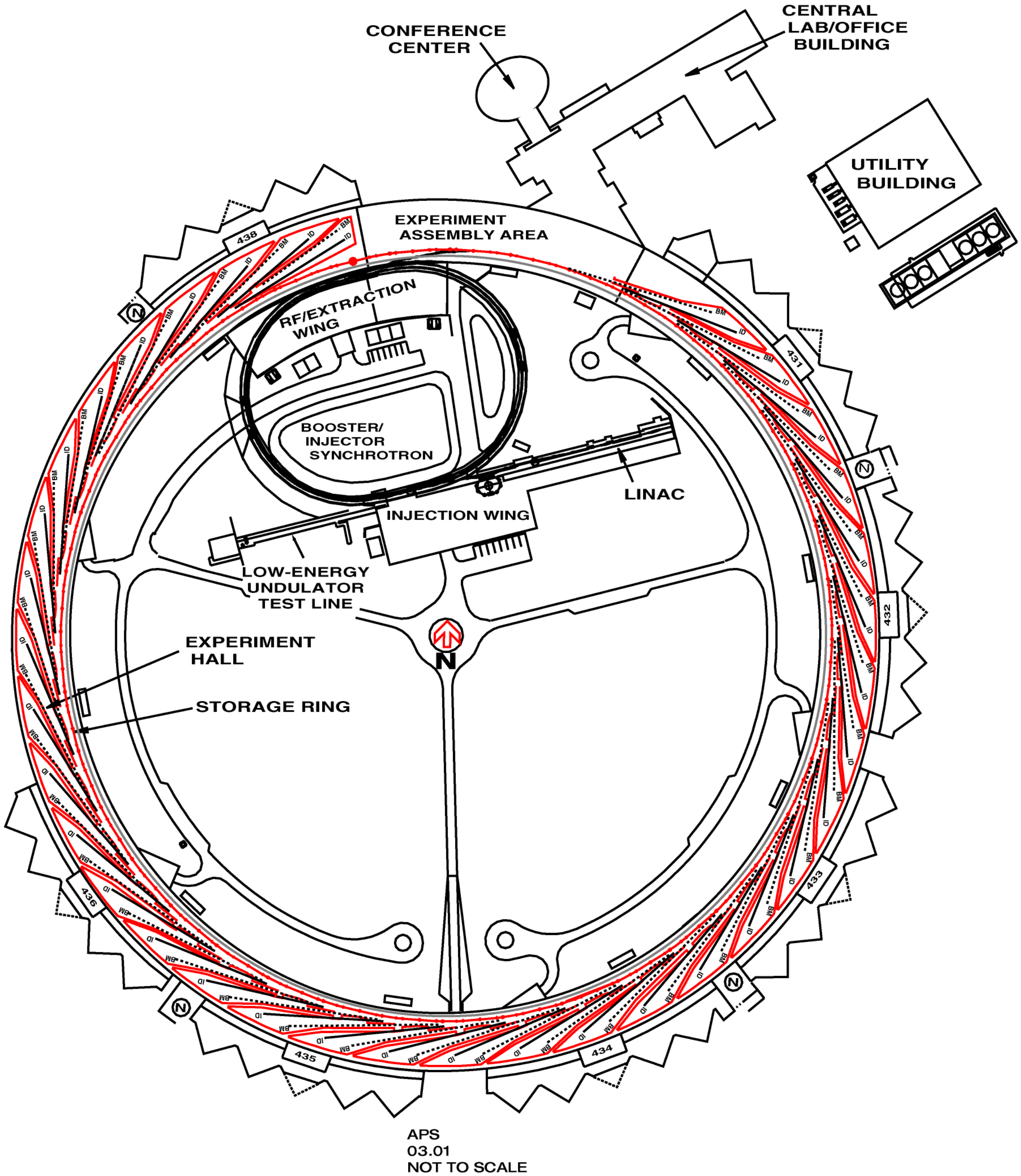

FIGURE 3.2 APS Accelerator Subsystems and Related Structures

sample under investigation. Most of the experiments performed at the APS are for studying the microscopic structure of materials on atomic-length scales. The materials studies are of interest to physics, biology, chemistry, and materials science communities. Typical samples include materials of interest to the semiconductor and magnetic materials industries, protein crystals (usually of the order of 100 microns or less in size), polymer fibers, and geological materials studied at high pressures. Samples are exposed to various types and wavelengths of x-rays produced by the beamlines. Samples are generally prepared in advance off-site and shipped to the APS facility. Additional manipulation of experiment samples (such as mounting samples on holders or soaking samples in solutions to provide better imaging) is occasionally conducted in the LOMs or experiment stations and may include the use of laboratory chemicals. User laboratory and office space consists of LOMs located adjacent to the experiment hall, and each LOM is associated with a sector of the storage ring.

A Low-Energy Undulator Test Line (LEUTL) is located in the central area of the APS ring and is an extension of the linear acceleration/accelerator (LINAC). The LEUTL is used in the testing of new designs for undulator insertion devices and for research into a fourth-generation light source producing ultra-high-brilliance synchrotron radiation.

Each year, a large number of scientists use the APS facilities (approximately 2,000 individual users in 2001). APS users include scientists from universities, industrial firms, national laboratories (including ANL-E), medical schools, and other research institutions. Scientific investigators use the APS either as members of CATs or as independent investigators. CATs, which consist of large numbers of investigators with common research objectives, are responsible for the design, construction, funding, and operation of their APS beamlines. CATs allocate a percentage of their beam time to independent investigators, either as individuals or groups. In 2002, 23 user teams had beamlines in use in 28 sectors of the experiment hall.

Facility expansion plans will add another cooling tower over the next five years to the three in the current APS infrastructure. Operation of the APS facility will continue to produce cooling-tower plumes, as well as sludge and blowdown water discharged from the cooling system. These effluents will continue to be handled in accordance with existing ANL-E and DOE policies.

The APS infield, that is, the center of the APS ring, contains a stormwater collection system that includes a series of interconnected collection basins. Storm water from the eastern half of the infield exits through a drain line and provides hydrologic input to Wetland R, a wetland constructed southeast of the APS storage ring to mitigate wetland impacts from APS construction. Large fluctuations periodically occur in Wetland R inflow following storm events, indicating a potentially high degree of surface water runoff in the infield area and unrestricted outflow through the drain line. Under the proposed action, the non-native vegetation within the infield would be replaced with native species, and the drain line openings would be modified to allow the water collection system to function with low fluctuations in outflow.

Native upland species would be planted in upland areas of the infield to reduce surface runoff. Native species tolerant of saturated soils would be planted in low areas of the collection basins to attenuate flows through the basins. In addition, covers would be placed on the drain line opening in the infield collection basin. The covers would be designed to attenuate flows exiting the infield, thereby reducing the large fluctuations while allowing infield flows to continue to enter Wetland R.

3.1.2 Enhanced Operations: BSL-3 Research Proposed for the APS

Evolving operations at the APS would include the initiation of BSL-3 research (see Appendix A). BSL-3 research would include bench-scale studies of the structure of proteins, genetic materials, and toxins of indigenous or exotic agents with a potential for respiratory transmission, and which may cause serious and potentially lethal infection. Infection from BSL-3 agents does not spread easily to others, however, and preventive or therapeutic intervention is available (high individual risk but low community risk).

3.1.2.1 Background

The biological segment of the Consortium for Advanced Radiation Sources (BioCARS) facility at the APS currently allows researchers to collect data with a wide range of samples by standard monochromatic crystallography, Multi-wavelength Anomalous Diffraction (MAD), Laue crystallography, and time-resolved crystallography (BioCARS 2002). Only a small percentage of the samples that have come to BioCARS in the past are hazardous to any degree. About 1% of the total samples are categorized as BSL-2 hazards, or about 3 or 4 samples a year. The most frequent BSL-2 sample studied at BioCARS is the human rhino virus (HRV), the virus that causes the common cold.

3.1.2.2 Proposed Action

Research on small BSL-3 samples would be conducted in the existing BioCARS facility. BioCARS is currently the only facility at ANL-E designed and constructed for work with samples classified as BSL-2 or BSL-3 agents. All experimental stations and control areas within the BioCARS experimental area can be operated in BSL-2 and BSL-3 modes. The existing BioCARS facility was constructed for, but never used for, BSL-3 research. The standard and specific safety practices, the required safety equipment (primary barriers), and the laboratory facility design (secondary barriers) for research with BSL-3 agents are described in the Centers for Disease Control and Prevention/National Institutes of Health (CDC/NIH) guidelines, *Biosafety in Microbiological and Biomedical Laboratories* (CDC 1999). The BioCARS implementations of these practices, as well as the engineering and administrative controls, are described in the BioCARS BSL-3 Standard Operating Procedure (SOP) that is part of the CARS Safety Plan (University of Chicago 2003).

The new BSL-3 research would not involve culturing of BSL-3 agents, because users of the BioCARS would use BSL-3 facilities at their home institution for that task. After the agent has been cultured and purified, the BSL-3 material is crystallized. The crystallization process orders many copies of the agent into a three dimensional array. Crystals of proteins and viruses are typically small, with any dimension exceeding 1 mm being extremely rare. Sizes on the scale of 0.1 mm are much more common. Only after the samples have been crystallized are they suitable for studies in the x-ray beams provided at BioCARS. Although culturing of the organisms would not take place at BioCARS, the crystallization process may, as some crystals are too fragile to transport.

The key engineering controls of the BioCARS facilities (Figure 3.3) that ensure safe operations at BSL-3 are (1) directed air flow, (2) a Class II, type B2 biological safety cabinet, (3) high-efficiency particulate air (HEPA) filters, and (4) a series of rooms in the facility that allow the isolation of the BSL-3 experiments from the rest of BioCARS and the APS. All air exhausted from the BSL-3 facility passes through HEPA filters that remove 99.97% of the particulates with a diameter of 0.3 μm or larger.

3.1.2.3 Scale and Scope

The proposed BSL-3 research at BioCARS differs from most other BSL-3 facilities outside of ANL-E in both scale and scope. Work at BioCARS involves tiny crystals making up a total sample volume of less than 10 mL on-site at any time. These samples are used either frozen at liquid nitrogen temperatures or sealed in capillaries. In either case, the potential for aerosol creation is minimized or eliminated completely. The scope of the proposed research would be limited to the study of one BSL-3 hazard at a time. On the basis of the current level of BSL-2 research, it is expected that there would be on the order of one or two BSL-3 experiments per year, each taking less than a week. In the crystallographic studies related to disease, the interest is in studying the interaction of a drug with its target protein. The target proteins themselves are usually nonhazardous, with the result that most of the research can be done without biohazards. It is only in the case where the structure of the entire agent, such as a virus, needs to be studied that researchers are required to use BSL-2 or BSL-3 samples.

3.1.2.4 Oversight

The ANL-E Laboratory Director established the Institutional Biosafety Committee (IBC) on October 2, 2002, to oversee and manage the site-wide biosafety program. The BSL work would be subject to IBC oversight. BioCARS works with the IBC to ensure that the BSL-3 Standard Operating Procedures (SOP) (University of Chicago 2003) are adequate for operations. The SOP establishes the following constraints on work done at BioCARS:

- Administrative limits on operations, such as a limit on the total volume of material (<10 mL) and a limit on the use of samples to pre-frozen or mounted in quartz capillaries.

- A prohibition on culturing microorganisms, and

- A prohibition against long term storage of BSL-3 samples.

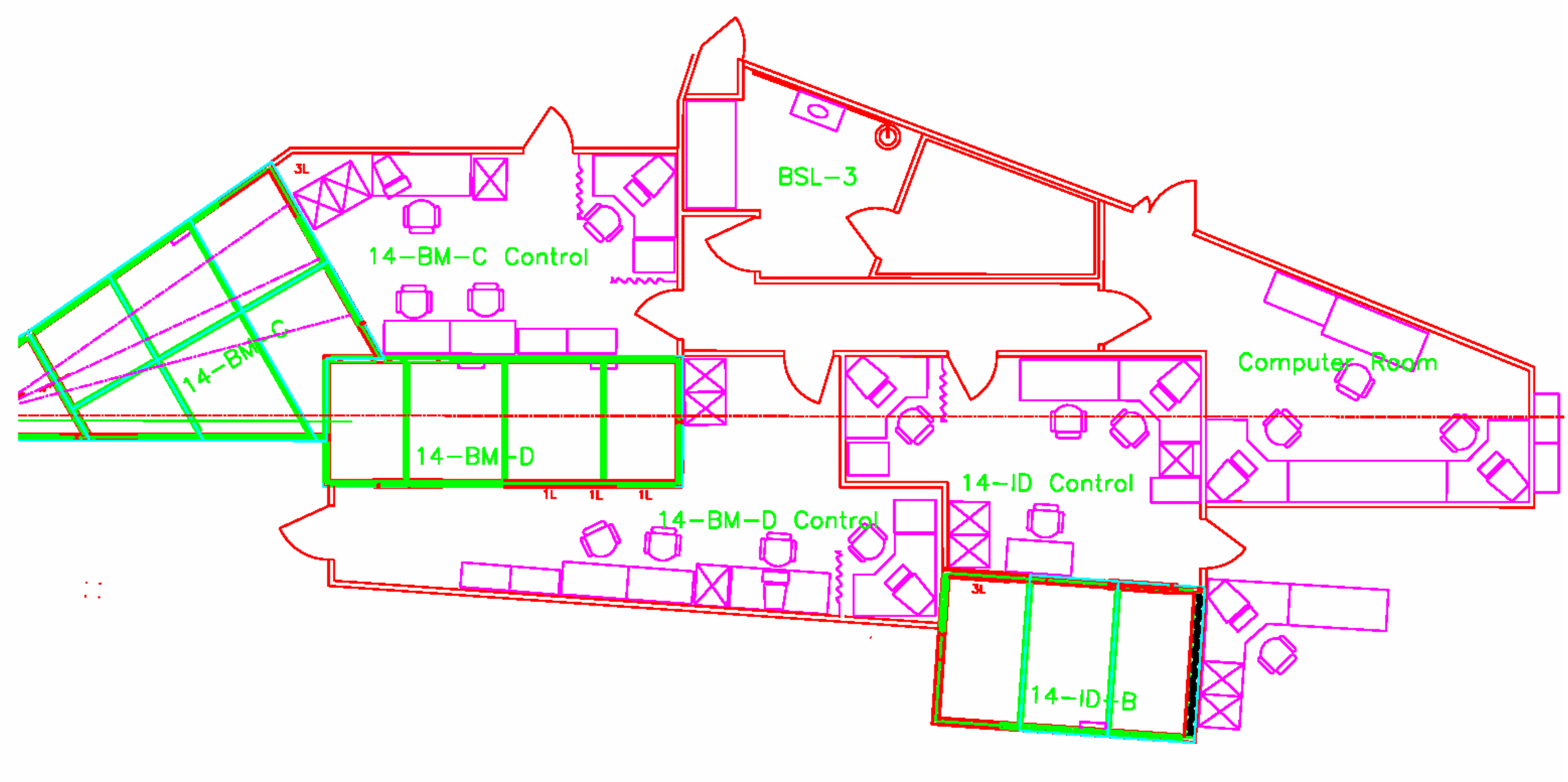

FIGURE 3.3 Diagram of the BioCARS Facility

In addition, the SOP specifies the procedures that must be followed by both staff and users of the facility. The IBC must approve all experiments involving BSL-2 and BSL-3 materials as part of its oversight responsibilities. A process for reviewing and modifying the BioCARS BSL-3 SOP on a regular basis is in place and is used to ensure all current Federal regulations are followed.

3.1.2.5 Select Agents

Select agents, as specified in 42 CFR 72.6, Appendix A, require additional regulation. Select agents are biological agents of human disease whose transfer or receipt requires a facility to be registered with the CDC under 42 CFR Part 72.6. Select agents have historically been associated with weapons production efforts and thereby require a heightened level of security. Regulation of select agents comes as a response to the threat of bioterrorism and attempts to limit the distribution of such agents while allowing their scientific use to, for example, develop vaccines. There are currently no proposals for working with select agents at BioCARS, and BioCARS is currently not approved for using any select agent. However, work with select agents at BioCARS in the future has not been precluded. Any future proposal for working with select agents at BioCARS would require special oversight by the IBC and the DOE Field Office, as spelled out in DOE N 450.7, 42 CFR 73, 7 CFR 331, and 9 CFR 121. If a proposal were made in the future to work with select agents at BioCARS, the proposal would be evaluated at that time to determine what NEPA review would be required.

3.1.2.6 Shipping

Shipping and receiving of all samples to and from BioCARS is supervised by the appropriate personnel from the BioCARS, ANL-E, and the user’s institution. Samples of all types must be brought to BioCARS according to the appropriate U.S. Department of Transportation (DOT) regulations: infectious agents must be packaged as specified in 49 CFR 173.196, and shipping personnel are required to be trained. The packages used are commercially available and have been certified by the manufacturer as required by DOT. The package types have undergone extensive drop, crush, and other accident condition testing before the DOT determined what packaging was appropriate to ensure safe transport of these types of samples. A typical package is shown in Figure 3.4. Sample packages arrive through ANL-E Receiving and depart through ANL-E Shipping. All transport of samples on-site to and from the APS is carried out according to the most current requirements of the ANL-E Hazardous Materials Transportation Manual. The samples are in sealed packages except when they are in use at the APS.

3.1.2.7 Waste

Waste from the facility is disinfected and collected for disposal with existing ANL-E protocols and personnel. Currently the decontaminated waste is shipped to an off-site vender for

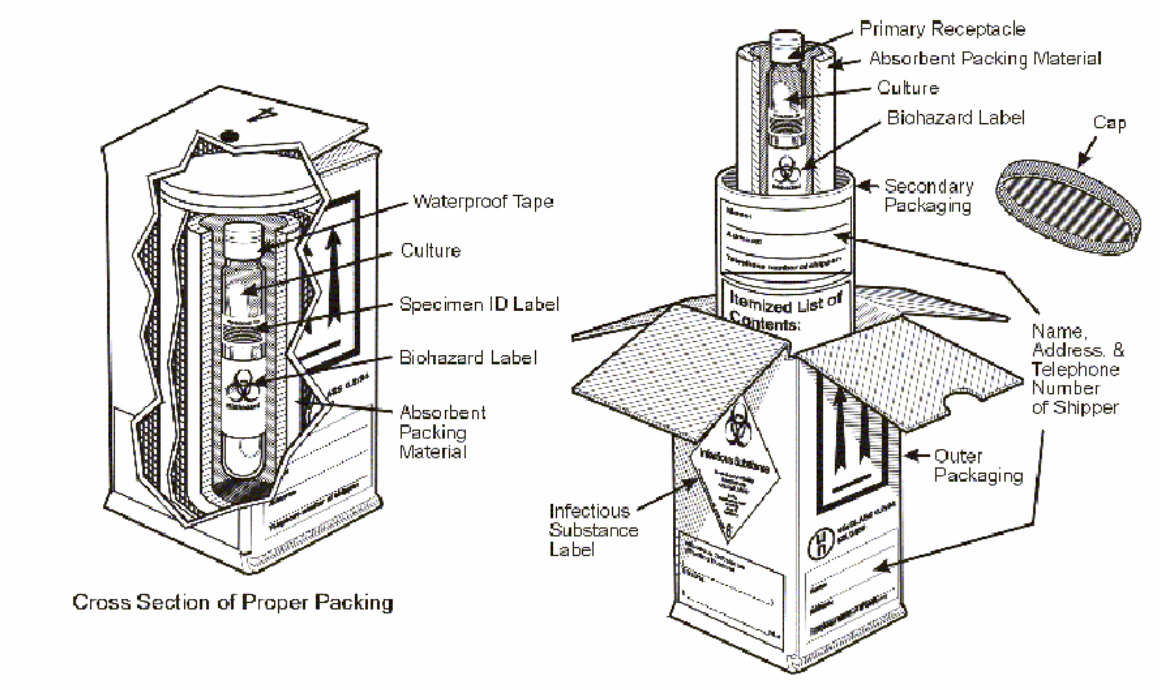

FIGURE 3.4 Diagram of a Typical Package Used to Ship Biological Materials to and from the BioCARS Facility

incineration. Because of the limited quantities of materials involved and the fact that BSL-3 research will displace other experiments at the facility that generate similar quantities of waste, the addition to the waste stream caused by the proposed action would be negligible (Appendix A).

3.1.3 Enhanced Operations: Construction and Operation of a Nanoscale Science Facility

The CNM facility would be constructed to house research activities on nanoscale science (Figure 3.5). The facility would reflect the diverse research of the collaboration between the APS and the ANL-E Materials Science and Chemistry Divisions, which is directed toward a major new thrust in nanoscience. The CNM facility would be located along the west side of the APS facility and connected to the experiment hall adjacent to a sector of the APS dedicated to x-ray beamlines in support of the CNM (Figure 3.5). A new LOM (LOM-437) would also be constructed immediately north of the CNM facility, adjacent to the APS experiment hall.

Research on nanoscale materials at the CNM facility would include lithographic patterning, nanoscale material fabrication using deposition and etching equipment, metrology, compositional and structural determination, and physical phenomena characterization. The CNM would include cleanrooms for wet chemical processing, laboratories for chemical and physical measurements, computational laboratories, offices, and conference rooms. Lithographic

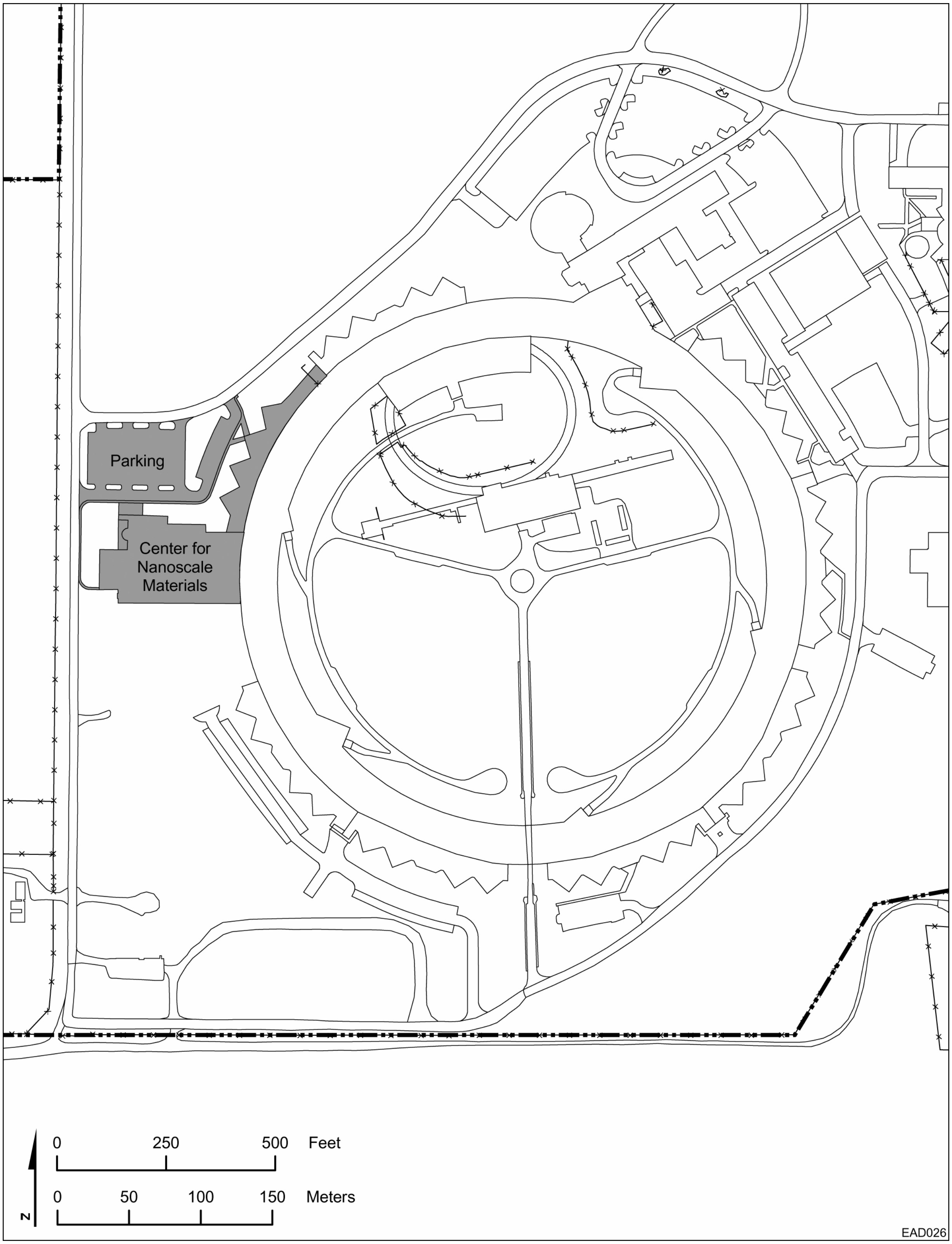

FIGURE 3.5 Proposed Construction at the Advanced Photon Source

self-assembly techniques utilizing biological materials would be carried out in BSL-2 laboratories, when appropriate. These BSL-2 laboratories would be designed as microbiological laboratories for conducting bench-scale research with biological agents. They would utilize safety precautions such as splash shields, face protection, gowns, gloves, and handwashing sinks. No work with select or etiologic agents would be conducted in the CNM.

The CNM would provide full-support facilities for lithographic patterning, including cleanrooms for wet chemical processing. Special deposition and etching facilities would be used for the fabrication of nanoscale materials and for transferring the patterns produced by lithography, chemical self-assembly, or polymer templating to actual structures of the material of interest. The CNM would house the large-scale deposition and etching equipment required to establish the special techniques needed to fabricate nanostructured materials. Several dedicated chambers would be provided to alleviate issues concerning contamination, which often limit one system to deposition or etching of a single or limited range of materials. The deposition chambers and relevant metrology tools would be effectively clustered according to utility and operational requirements, such as for the provision of source gases, use of scrubbers to clean exhaust air, and the collection and disposal of waste effluent in a safe and efficient manner. A more detailed discussion of CNM research under the Proposed Action is included in Appendix B.

The new facility would include 48,000 ft^2 (4,459 m^2) (net) to 100,000 ft^2 (9,289 m^2) (gross) of floor space in two stories and would consist of five major components: (1) conventional facilities, (2) fabrication facilities, (3) instruments for characterization, (4) high-throughput computational facilities, and (5) new x-ray beamlines. Approximately 10,000 ft^2 (929 m^2) would be dedicated to cleanroom areas, a similar amount to other research laboratories, up to 20,000 ft^2 (1,856 m^2) to offices and conference areas, and the remainder to support facilities. The footprint of the facility would be approximately 50,000 ft^2 (4,645 m^2). The building footings will be 4 ft (1.2 m) below the proposed finished floor elevation of 744 ft (227 m). The conventional facilities would make use of the APS's large utility infrastructure. A new 1-MW (3.5 MMBtu/h) natural-gas-fired boiler for humidification would be associated with the CNM complex. This boiler would not be operated during the summer and would normally operate at less than peak capacity. Emissions from cleanrooms would exit the facility through scrubbers or high-efficiency particulate air (HEPA) filters, which would reduce emissions by more than 99%.

A Stormwater Pollution Prevention Plan (SPPP) would be prepared prior to construction to address potential impacts to surface water quality from construction of the CNM facility. During construction of the CNM facility, stormwater discharges would be covered by the Illinois State General Stormwater Permit (ILR 10), upon notification to the Illinois Environmental Protection Agency (IEPA) through the Notice of Intent for such activity. Compliance with the general provisions of the permit would require preparation of an SPPP for the project site, prepared in accordance with Part IV of the general provisions of NPDES Permit ILR 10.

Before construction activities began, sediment and erosion control measures would be put in place to mitigate the potential impacts of the construction of the proposed facility on surface water resources downgradient of the project site. Approved ANL-E construction practices, such as sediment fences, compaction, contouring, and sediment retention basins would be used to minimize potential runoff, erosion, and sedimentation. During construction of the CNM facility, stormwater would continue to be routed through the stormwater drainage system to the stormwater collection basin serving the western portion of the APS site, which would serve as a sediment retention basin. Although turbidity in stormwaters would settle out in the collection basin, discharges from this basin would be monitored to ensure that impacts to downstream surface waters, including Wetland 302, are avoided.

After construction of the CNM facility and parking area, all disturbed soils would be landscaped and revegetated to retard runoff and control erosion. Sediments in runoff would be routed through a collection basin, which would reduce sediment load. In compliance with Executive Order 13148, *Greening the Government through Leadership in Environmental Management*, native plant species would be used for landscape plantings on the CNM facility site. Executive Order 13148 directs federal agencies to implement environmentally sound landscaping practices, such as the use of native species, to reduce adverse impacts to the natural environment.

During operation of the CNM facility, controls for the management of stormwater flows from the CNM site would be put in place to reduce flow fluctuations and the amplitude of peak flows and to remove or filter contaminants to meet water quality criteria that are protective of wetlands, including wetland communities and component biota. Stormwater runoff from all existing roof drains and land surfaces that would not be disturbed by construction (including the existing parking lot near LOM 438) would continue to be directed to the location of the existing culvert near the intersection of Rock Road and Kearney Road. This runoff would continue to enter the small stream and subsequently enter Wetland 302. Flow from all new roof drains associated with the CNM facility and new LOMs, as well as landscaped areas, would also be directed to that location and would enter Wetland 302. Runoff from all existing and new roof drains would first enter a new stormwater detention basin, which would temporarily detain stormwater and attenuate flow peaks prior to release. Roof drains from the CNM facility would enter a detention basin constructed east of the CNM parking area. This basin would have a capacity of approximately 10,500 ft^3 (297 m^3), a surface area of approximately 2,625 ft^2 (243.8 m^2), and would be 4 ft (1.2 m) deep. Vegetation planted within the basin would consist of a mixture of native herbaceous species tolerant of inundation as well as dry periods, such as prairie cord grass (*Spartina pectinata*), marsh blazing star (*Liatris spicata*), mountain mint (*Pycnanthemum virgianum*), or sneezeweed (*Helenium autumnale*). In addition, a replaceable filter (such as Fossil Filter™) would be included in the drainage system outlet to the receiving stream, to further lower contaminant concentrations. This filter would remove 69 to 92% of the petroleum-based oil and grease (KriStar undated).

Under the proposed action, a parking area about 40,000 ft^2 (4,000 m^2) would be constructed adjacent to the north side of the CNM facility at the intersection of Kearney and Rock Roads, in the area currently occupied by a stormwater collection basin. Runoff from the parking area would enter a new stormwater collection basin adjacent to the parking area. The basin would have a capacity of approximately 3,033 ft^3 (85.89 m^3), would be 4 ft (1.2 m) deep, and would have a surface area of about 1,054 ft^2 (97.91 m^2). Parking lot runoff would be pumped from this collection basin away from Wetland 302. A 200-gpm (760 L/min) pump would continuously pump the collected stormwater, which would be directed south along Kearney Road by means of a 10-in. (25-cm) diameter drain line. The drain line would discharge to a grassy swale that would be constructed along Kearney Road. The swale would filter out contaminants, increase infiltration, and reduce flow velocities. The swale would be 200 ft (60 m) long, with a longitudinal slope of 2-3%, and it would be graded to create sheet flow. It would be constructed with a trapezoidal cross section, with 3:1 side slopes (horizontal to vertical). The swale bottom would be 2-8 ft (0.6-2 m) wide, and the total swale width would be at least 20 ft (6 m). Check dams, 1 ft (0.3 m) in height, would be placed along the swale every 50 ft (15 m), with the first located 20 ft (6 m) from the point of inflow. The swale would be designed for a 2-year, 24-hour storm event, which would result in a maximum flow rate of 1 ft/s (0.3 m/s), and a maximum water depth of 4 in. (10 cm). It would be able to accommodate flows from a 100-year, 24-hour storm. The swale would be planted with prairie cord grass (*Spartina pectinata*), which would be inspected annually and replanted where growth was sparse or absent.

The pumped stormwater runoff would exit the ANL-E site at the south fenceline. Overflow from the collection basin would enter the stream north of Rock Road. Periodic maintenance would be performed to ensure proper functioning of the detention basins. Maintenance would include replanting vegetation in areas of reduced growth, removing accumulated sediments, and repairing areas of eroded soil.

In addition to the proposed parking configuration, three alternative parking options are considered in this EA. More detailed discussions on those alternative parking lot options are provided in Appendixes D and E. Under parking alternative B, the parking area location would be the same as under the proposed option; however, bioretention swales would be incorporated into the CNM facility parking area to receive stormwater flows from this parking area and adjacent areas, and stormwater would not be routed away from Wetland 302. The bioretention swales would be located between parking rows and along the western edge of the parking lot. Stormwater runoff would infiltrate through the bioretention swale vegetation and soil. Drainage from the bioretention swales would be collected in an underground system of perforated drainage pipe. The bioretention swales would temporarily retain stormwater flows, permit a gradual release of water, and filter out and degrade contaminants. The design capacity for the bioretention swales would be to treat a mean 6-hour storm event, and they would be sized to total 7% of the parking area. The surface of the bioretention swales would be recessed below the parking surface and would allow ponding of water to a depth of 6 in. (15 cm). Overflow would be directed to the underground drainage system.

The surface of the bioretention swales would consist of a 3-in. (7.6-cm) thick shredded hardwood mulch layer, placed above a 4-ft (1.2-m) thick layer of loam-textured planting soil. The soil would have a clay content of 10 to 25%, organic matter content of 1.5 to 3%, a pH range of 5.5 to 6.5, and an infiltration rate greater than 0.5 in. (1.25 cm) per hour. An 18-in. (0.5-m) layer of gravel or sand would be placed below the soil and would contain the drainage pipe. Vegetation planted in the bioretention swales would be a mixture of native herbaceous species tolerant of inundation as well as dry periods, such as prairie cord grass (*Spartina pectinata*), switch grass (*Panicum virgatum*), marsh blazing star (*Liatris spicata*), and mountain mint (*Pycnanthemum virgianum*), or New England aster (*Aster novae-angliae*). Periodic maintenance would be performed to ensure proper functioning of the bioretention swales. Maintenance would include removal of sediments, addition of mulch where needed, and replanting of vegetation in areas of reduced growth. The mulch layer would be removed and replaced annually, and soils and vegetation would be replaced every 5 years.

Following infiltration through the bioretention swales, runoff from the parking area would enter an underground drainage system, which would also receive the releases from the new retention basin for roof runoff. The combined flows within this drainage system would be directed to the location of the existing culvert under Rock Road, and enter the stream flowing into Wetland 302.

Under parking alternative C, the main parking area would be located approximately 400 ft (100 m) south of the CNM facility. This parking area would be about 37,000 ft^2 (3,400 m^2) in size. Stormwater runoff from this parking area would drain to the south along Kearney Road. A grassy swale would be constructed along Kearney Road to filter out contaminants, increase infiltration, and reduce flow velocities. The parking area runoff would then exit the ANL-E site at the south fenceline. A pedestrian walkway from the parking area to the CNM facility would also be constructed. A smaller parking area, about 16,000 ft^2 (1,500 m^2) in size, would be located on the north side of the CNM facility. This smaller parking area would accommodate handicap and other special needs parking. Stormwater runoff from this smaller parking area would drain to the detention basin for collection of roof runoff, and subsequently to the receiving stream north of Rock Road.

Under parking alternative D, the main parking area would be located south of the CNM facility, as in alternative C above, however it would consist of a multi-story parking facility. The footprint of this facility would be about 28,000 ft^2 (2,600 m^2) with about 80 parking spaces per floor. Either two or three floors would be constructed, with the top floor designed as exposed parking. Stormwater runoff from this parking area would drain to the south along Kearney Road. A bioswale would be constructed along Kearney Road to filter out contaminants, increase infiltration, and reduce flow velocities. The parking area runoff would then exit the ANL-E site at the south fenceline. A pedestrian walkway from the parking facility to the CNM facility would also be constructed. A smaller parking area would be constructed on the north side of the CNM, as for alternative C.

3.1.4 Schedule and Manpower

Construction of the CNM would take approximately 2 years and require a workforce of up to 50 construction workers. Materials used to construct the facility would include fill, asphalt, structural steel, and concrete. Estimated construction costs for the CNM are on the order of $25 million. The CNM would have a permanent staff of 60, with 130 offices and a total occupancy of 150.

3.2 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, current APS operations would continue. The types of research presently conducted at the facility, as well as present materials and waste handling procedures, would continue. Maintenance of accelerator and support systems, including replacement of system components, as well as minor infrastructure modifications required for continued operations, would occur. In addition, actions to address impacts to Wetland R would be implemented. However, operational changes, such as the initiation of BSL-3 research, would not occur, and the new CNM research facility would not be constructed under the No-Action Alternative.