

Effluent discharged from the Strawberry Monitoring Station eventually flows through a constrained portion of the City of Berkeley's sewer system adjacent to the Memorial Stadium. The Laboratory will partner with the City of Berkeley and UC Berkeley in an effort to replace or bypass this section of City sewer main.

The Laboratory's peak daily flow during wet weather is approximately 821,000 gallons per day (gpd). With the development identified in this Plan this rate is expected to increase by 72,000 gpd to 893,000 gpd. At this rate the Laboratory's sewer system would continue to have the capacity and reliability necessary to accommodate further growth. Both the City of Berkeley and EBMUD anticipate that their systems would have available capacity to accommodate the Laboratory's projected wastewater flows.

Storm Drainage

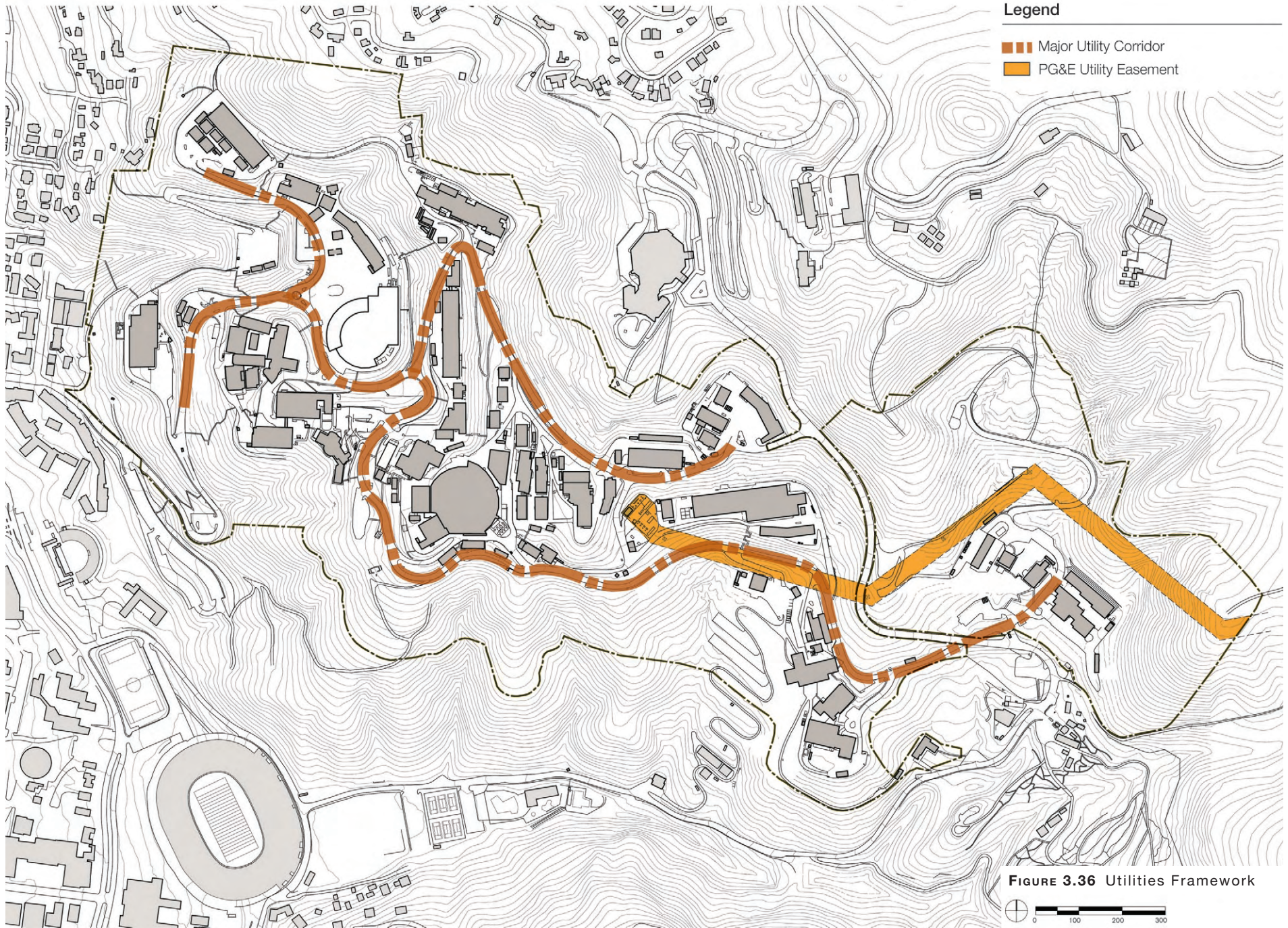
Berkeley Lab is situated within Blackberry and Strawberry Canyons which lie mostly within the Strawberry Creek Watershed. Surface drainage naturally flows from higher elevations and the Laboratory site to Strawberry Creek in Strawberry Canyon to the south and to the North Fork of Strawberry Creek in Blackberry Canyon.

The Laboratory's storm drainage system directs surface water runoff and piped flows from higher elevations away from unstable slopes, buildings, and parking lots. Storm water is then discharged at points below the developed area of the site. Peak flows generated by the Laboratory site and the surrounding properties is approximately 1,686 cubic feet per second (cfs).

The Laboratory's drainage system has been constructed of galvanized steel pipe that is in need of repair. Over the duration of this Plan approximately two thirds of this steel pipe will be replaced or fitted with nonmetallic lining. As new projects are developed the drainage system will be expanded as necessary to drain surface water from buildings and parking lots and unstable slopes. New projects will be developed in accordance with the Laboratory's site and landscape design guidelines to minimize impervious surfaces, and conditions that result in unstable slopes, erosion and siltation. By making improvements to existing landscaped areas in accordance with the Laboratory's design guidelines, no increase in storm water peak flows should be generated by the development identified in this Plan.

Electrical Power and Distribution

The Laboratory's electrical supply and distribution system has the capacity to meet current and future demand beyond what is



Legend

- Major Utility Corridor
- PG&E Utility Easement

FIGURE 3.36 Utilities Framework



forecast in this Plan. The Laboratory's electricity is purchased from the Western Area Power Administration and is delivered by the regional power utility Pacific Gas and Electric (PG&E). Berkeley Lab's 2005 baseline consumption was 72,400 megawatt hours (MWh) with a maximum demand of 12.5 megawatts (MW). The capacity of the Laboratory's electrical system is 50 MW with 100% equipment backup.

Electrical power is delivered to the on-site Grizzly Substation through a pair of overhead transmission lines with a capacity of 50 Megawatts each. In the event of a power outage from its primary supply the Laboratory may switch to a secondary source supplied from UC Berkeley's Hill Area Substation, located adjacent to the Grizzly Substation. The main on-site power distribution system consists of a 12,470 volt underground feeders with smaller substations and transformers located throughout the site. The main distribution system has dual primary feeders to provide reliable power. Stationary and portable emergency power generators are located throughout the site to provide an emergency power supply for critical process systems and life safety facilities such as the Fire Station, Radio Communications Facility, and the Health Services Building.

Development under the 2006 LRDP would not require a major expansion or upgrade to the Laboratory's existing electrical distribution system. However, new projects would require specific power connections to the existing distribution system. New building and existing equipment replacement projects would enhance the Laboratory's on-going energy conservation efforts.

Natural Gas Distribution

The Laboratory's natural gas distribution system provides a safe supply of high-pressure natural gas with a capacity to meet current and future demand. Natural gas is purchased through the Defense Fuel Supply Center and supplied through PG&E, the regional transporter of natural gas. Natural gas usage in 2005 was approximately 1.6 million therms. Full implementation of the 2006 LRDP would increase the demand for natural gas by as much as 814,000 therms per year.

PG&E provides gas to the site through a 6-inch high-pressure main that connects with the on-site system at a meter vault near the Laboratory's Blackberry Gate. The on-site distribution consists primarily of 6-inch and 4-inch high-pressure lines



FIGURE 3.37 Grizzly Substation and UC Berkeley's Hill Area Substation each provide emergency backup for the other

equipped with pressure reducing stations and earthquake emergency shut-off valves.

Older gas mains will be replaced through a phased replacement program that would relocate gas mains to the utility corridors identified in Figure 3.36 whenever possible. Development under the 2006 LRDP would require a lateral connection for each new building. New building and existing equipment replacement projects would enhance the Laboratory's on-going energy conservation efforts and reduce its per-capita natural gas consumption.

Telecommunications and Network Distribution

The Laboratory's external communication link is provided by the regional telecommunications company AT&T. Both fiber and copper communication circuits are delivered through underground communications lines via the main Hearst Street route. The current system supplies 5,000 communications lines and can be expanded to 35,000 lines with additional hardware. The telecommunication system is distributed via four nodes, each equipped with backup generators and battery back up to support extended communications for the Fire Station and the Health Services buildings.

Berkeley Lab's computer network system (LBLnet) also utilizes the fiber optic and wiring infrastructure for distribution. LBLnet is maintained as a leading edge infrastructure and is planned using an industry-standard 5 year life cycle. Currently LBLnet serves one gigabit per second (Gbps) Ethernet with a high speed (720Gbps) backbone. Plans are underway to upgrade both Internet connectivity and building connections to 10Gbps to support multiple high-bandwidth streams for research activities. In the future it is expected that 100Gbps will be essential to research disciplines such as high performance computer simulation and bioinformatics that require the expeditious movement of massive data sets among research institutions.

Berkeley Lab's communications and distribution system has the capacity to meet current and future demand beyond what is forecast in this Plan. Development under the 2006 LRDP would not require a major expansion or upgrade to the Laboratory's existing communications distribution system. However, new projects will require connections to the existing distribution system.