

Amended Site Location
The University of Texas at Austin

TRIGA Research Reactor

Docket #50-602

April 30, 1985

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The amended site location for The University of Texas at Austin TRIGA reactor facility and the Nuclear Engineering Teaching Laboratory is located in the northeast region of the Balcones Research Center east tract (Figure 1 and 2). Situated approximately 240 feet from the northeast boundary of the research center site (Figure 3 and 4), the facility is oriented with the front entrance toward the site boundary and the rear entrance toward the site interior.

Access to the general area of the research center east tract is provided by state Highway 1325 (Burnet Road) on the southeast, Braker Lane to the northeast and Longhorn Boulevard to the southwest. The northwest side of the research center east tract is bounded by the Missouri Pacific Railroad. Access within the research center to the northeast site area and the proposed facility is provided by way of a loop and a spur from the major northeast site entrance.

Areas of the Balcones Research Center and its related activities are situated to the south, southwest, west and northwest of the proposed facility. A large industrial complex (data processing products manufacturing facility) is located to the north of the site area. Areas beyond the research center boundary to the northeast, east, and southeast include several small business activities (retail stores, offices, warehouses) of various types. Distances from the proposed facility location to other adjacent activities on the research center site are 235 feet and 780 feet to the Bureau of Economic Geology facilities located to the northwest, about 525 feet to the Water Resources facilities located to the southwest, about 1000 feet to the Center for Electromechanics and Center for Energy Studies located to the west, and approximately 250 feet to an Ecology Garden located to the south. Offsite commercial activities in the immediate area include a large computer manufacturer facility located to the north at a distance of at least 625 feet, several small business operations to the northeast and southeast at a distance of at least 500 feet and a couple of commercial activities located between 275 and 375 feet to the east of the proposed facility location.

Specific site characteristics are an elevation of 790 feet with a variation of less than 2 feet in the immediate vicinity of the building location and expected soil load conditions of 40,000 lbs/ft² below the removed top soil to support building structures. Beneath the reactor tank and shield structure a concrete thickness of at least 2 feet is planned for separation and support of the tank and shield structure from the local site conditions. The level of the first floor of the building is planned for an elevation 7 feet below the mean grade level of the general site area. Specific features of the local site conditions and building plan layout are related to two important design considerations for the control of facility effluents. First is the drainage of water from the site to prevent flooding of the below grade, lower floor level, and second is the release of exhaust air from the site to provide dilution of gaseous releases above the upper roof level.

Water drainage of the immediate site to prevent flooding is primarily related to the potential but temporary occurrence of extreme rainfall rates. Surface water runoff from the research center site is drained into the Shoal Creek watershed except for the extreme northeast region of the site which drains into the Walnut Creek watershed. The proposed facility is located in the northeast site region with drainage into the Walnut Creek watershed but near the dividing line to the Shoal Creek watershed. Situated at an elevation about seven feet below the maximum between the two watersheds, but well above the local area flood planes, and located nearly equidistant, one half-mile, from drainage easements of both watersheds, no significant general site area flooding is anticipated.

Facility design includes provisions and features for removal of water runoff from roof and surrounding areas. Water drainage from the site is also provided from the drive access area to avoid localized flooding of the lower level. The drainage provisions and small area for water accumulation compared to the large area of the first floor level combine to limit the potential for any flooding of the first level. Minor flooding of the first level, although not anticipated, does not represent a safety hazard to the reactor operation.

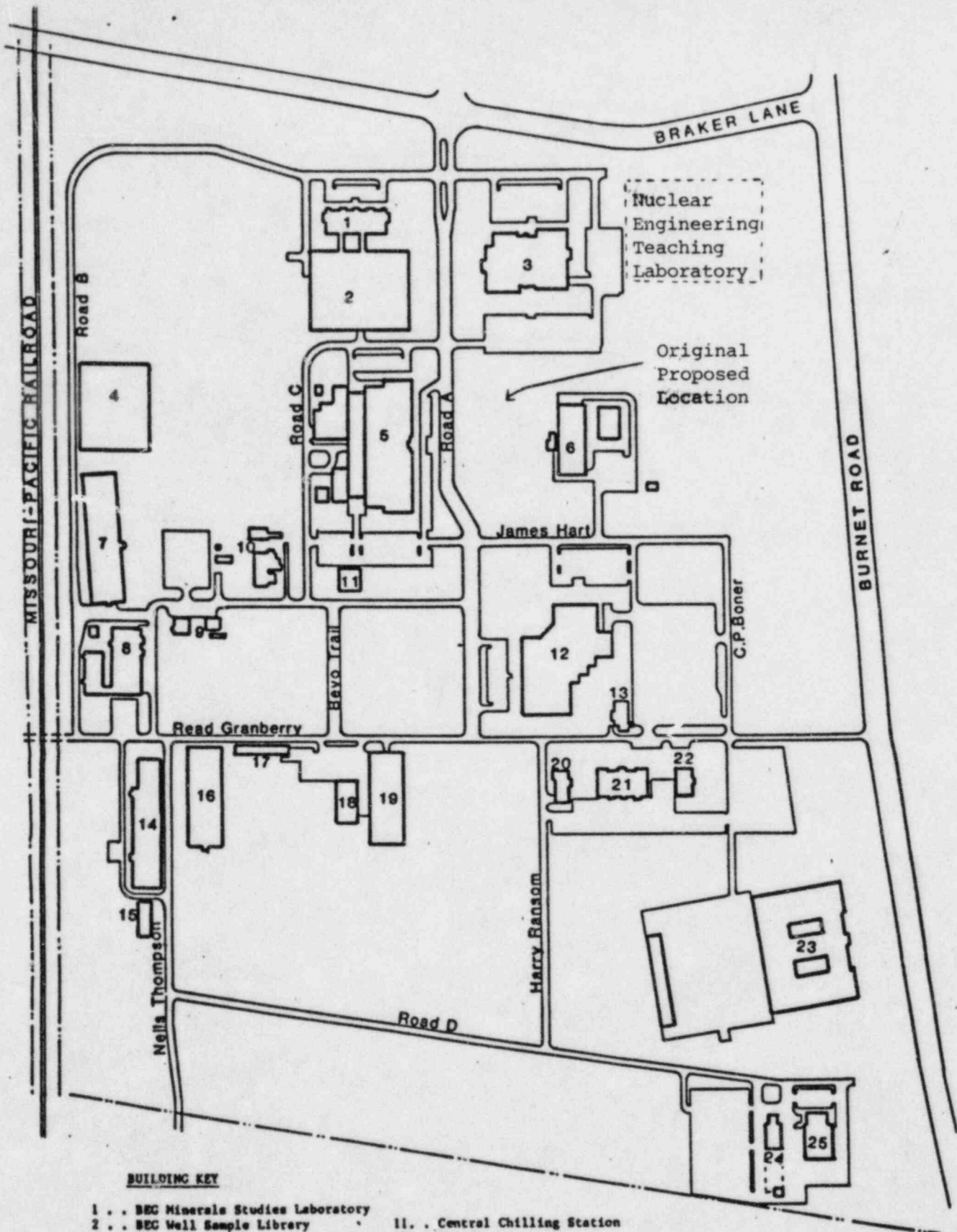
Discharge of exhaust air from the facility is planned from a stack with air ejected from a point above the roof line of the building. Dispersion of argon-41 contained in the exhaust will depend on ventilation dilution, exhaust velocity, release height and assumed building cross section as well as distance from the release point. At the proposed facility location, the nearest occupied buildings are located roughly north and east of the facility. Both expected wind velocities and directional frequencies are at minimums in the north and east directions.

Safety analysis of gaseous effluent releases apply a dilution factor that assumes a building cross section of 2520 ft² for the reactor bay area of the structure. If the entire building structure is included, the minimum cross section is 4892 ft² in the northwest and southeast directions, and 6446 ft² in the northeast and southwest directions. Although air exhaust releases will be at effective heights greater than the adjacent buildings, air mixing in the lee of the building should be aided by wind velocity profiles. In the direction to the nearest buildings, east and west, mixing will be aided by light and variable winds, while the prevailing winds from either the north or south are in the direction of more distant buildings.

Conservatism of the dilution factor in the building wake and estimates of peak concentrations released indicate that argon-41 releases do not endanger the public health or safety. Actual annual releases from similar facilities support the conclusion that measured releases are substantially less than estimated releases. An average annual release concentration of $2 \times 10^{-6} \mu\text{C}/\text{cm}^3$ for The University of Texas at Austin proposed facility provides an additional limit to the actual release of argon-41 gas concentrations.

Environmental impact at the facility site will consist of those activities expected for construction of a typical building of 19500 square feet. Some site preparation work such as general clearing and leveling resulted from operations of a magnesium plant at the site in the 1940's. Additional site preparation and other activities of construction will represent a small impact relative to the nearly 555,000 gross square feet of construction being completed in the first phase of a major development program for the Balcones Research Center. The first phase of construction includes some research center site utilities, several service related utilities and service roads.

At the location of the planned site an excavation of approximately 2200 cubic yards is projected, most of which will be reused in development of the final site and building plan layout. No measurable significant impact either temporary or permanent is anticipated beyond the immediate construction area. Other construction projects in the area such as completion of Braker Lane and extension of Loop 1 near the research center will have substantially larger temporary and permanent impacts to the area.



BUILDING KEY

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| 1. . . BEC Minerals Studies Laboratory | 11. . Central Chilling Station | 20. . Earth Sciences and Engineering |
| 2. . . BEC Well Sample Library | 12. . The Commons | 21. . Electrical Engineering Research |
| 3. . . BEC Research and Administration | 13. . BRC Security Station | 22. . BRC Physical Plant Administration |
| 4. . . LCRA Substation | 14. . Ferguson Laboratories | 23. . Applied Research Laboratories |
| 5. . . Electromechanics/Energy Studies | 15. . Construction and Maintenance Warehouse | 24. . Physical Plant Services Center |
| 6. . . Water Resources Center | 16. . Warehouse | 25. . Physical Plant Services Center |
| 7. . . Physical Plant Warehouse | 17. . Petex | |
| 8. . . Paleontology Laboratories | 18. . Physical Plant Supply | |
| 9. . . Archaeology Laboratories | 19. . Warehouse | |
| 10. . . Aerodynamics | | |

FIGURE 1

BALCONES RESEARCH CENTER EAST TRACT



0 100 500

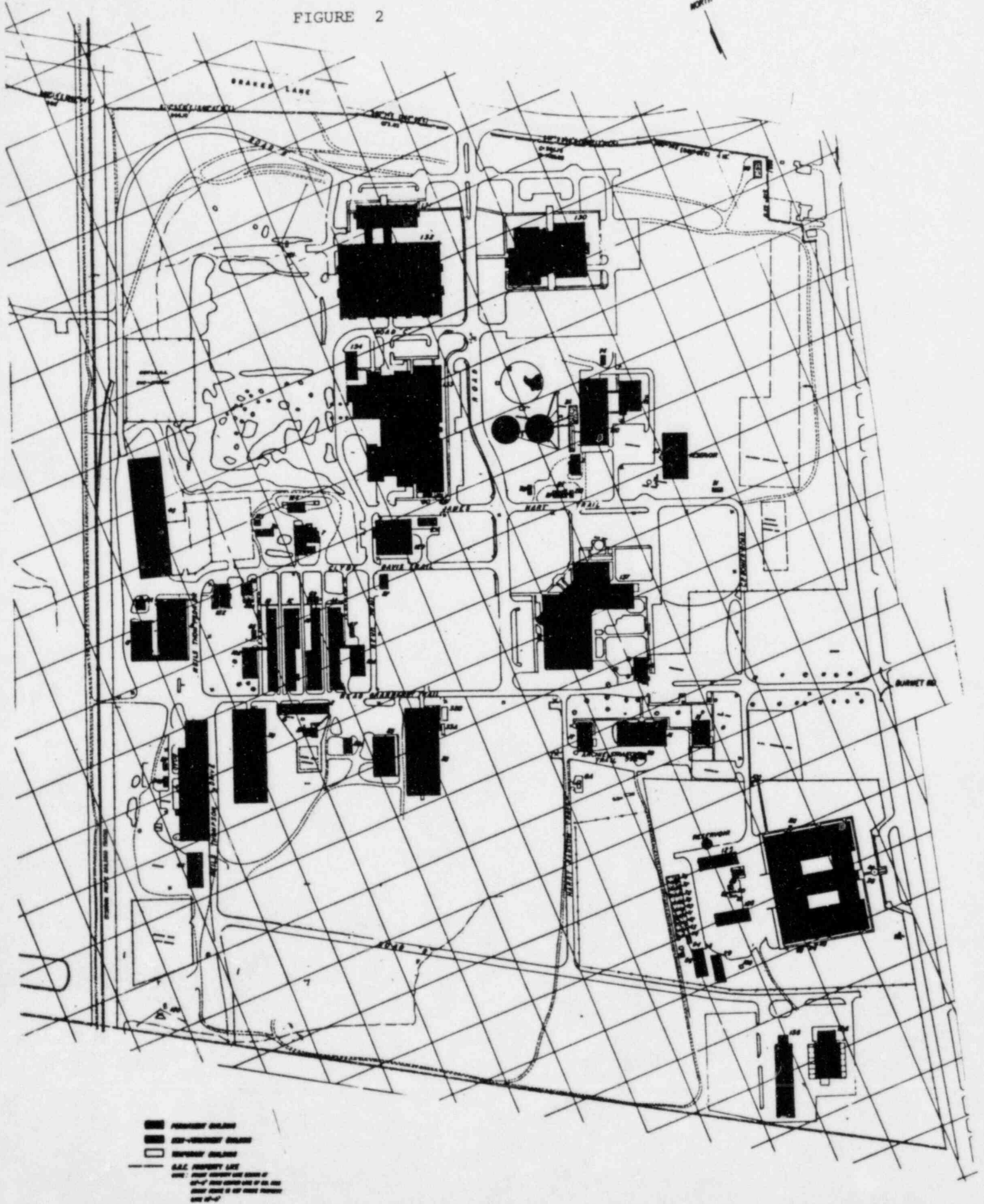
BALCONES RESEARCH CENTER

THE UNIVERSITY OF TEXAS AT AUSTIN

SCALE 1"=200'-0"

DATE 10 APRIL 1964

FIGURE 2



LOCATION MAP

SCALE: 1" = 200'-0"

NORTH

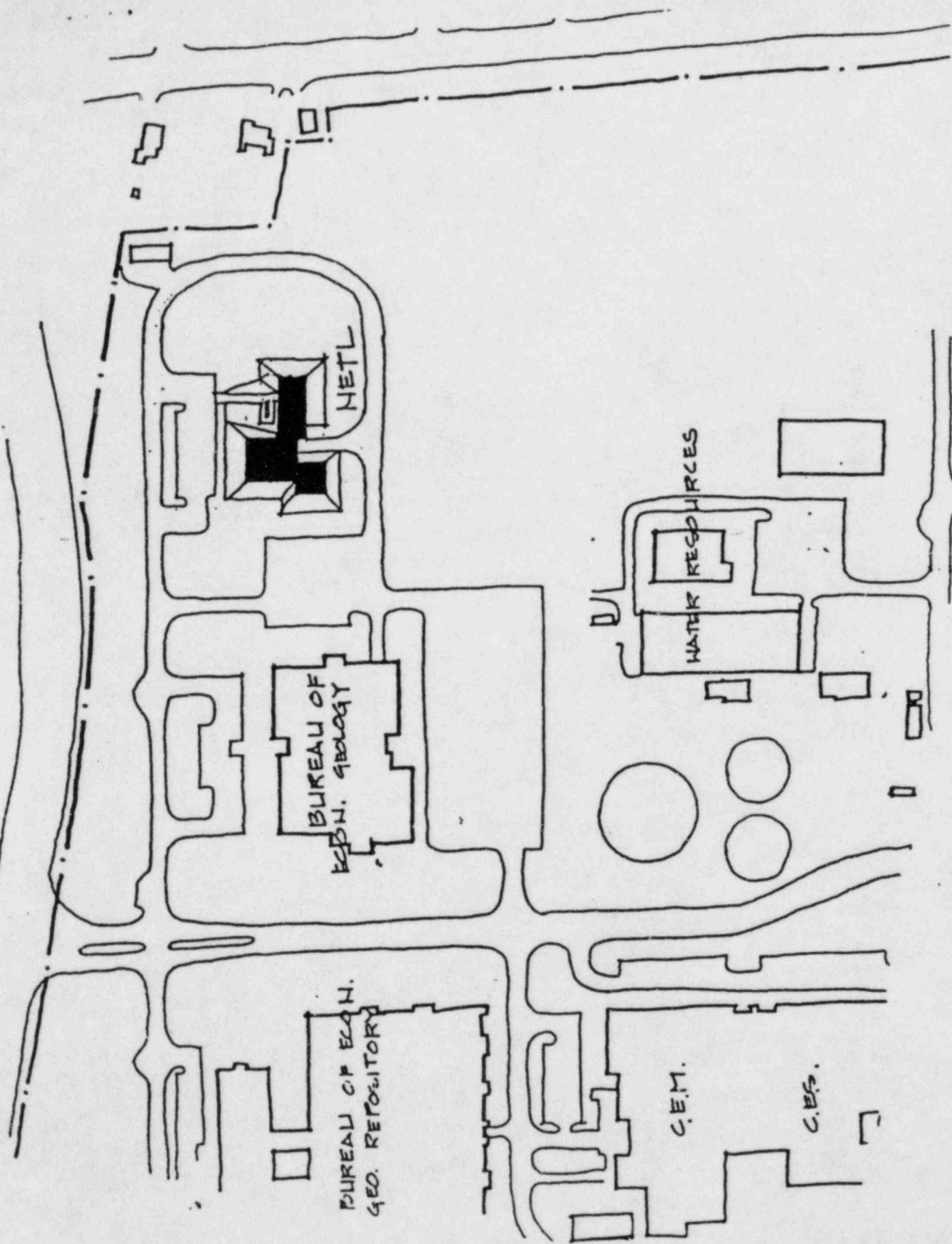


FIGURE 3

LOCATION MAP

SCALE: 1" = 200'-0"

NORTH

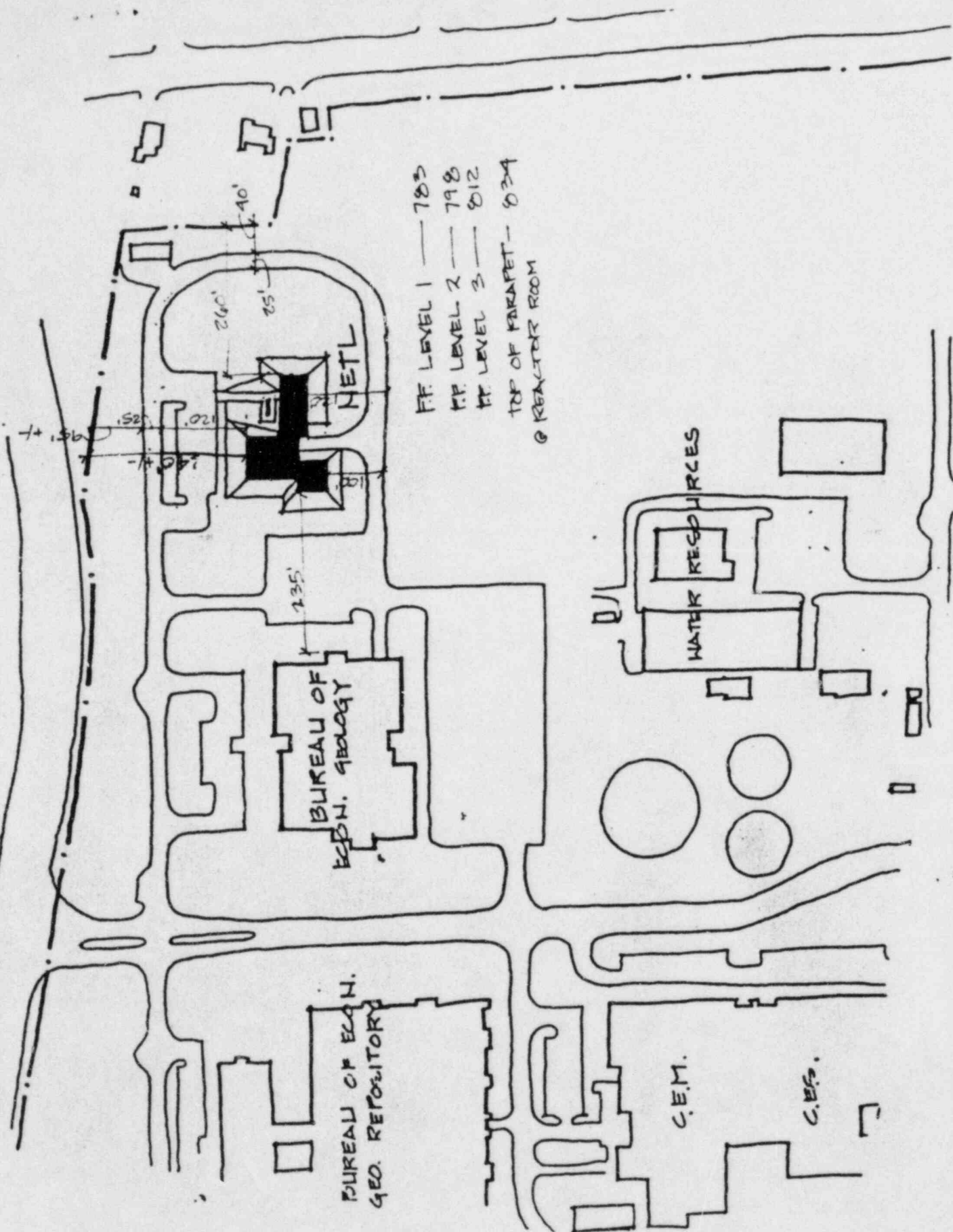


FIGURE 4