

ENVIRONMENTAL ASSESSMENT
ISSUANCE OF AN ENDANGERED SPECIES
SECTION 10(a) PERMIT FOR
THE INCIDENTAL TAKE OF THE
TOOTH CAVE GROUND BEETLE (*Rhadine persephone*)
AND BEE CREEK CAVE HARVESTMAN (*Texella reddelli*)
DURING CONSTRUCTION AND OPERATION OF
A REGIONAL SHOPPING MALL NEAR
AUSTIN, WILLIAMSON COUNTY, TEXAS

SEPTEMBER, 1991

U.S. FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
611 EAST SIXTH STREET, FOURTH FLOOR
AUSTIN, TEXAS 78701

COVER SHEET

Title for Proposed Action: Issuance of Endangered Species Act Section 10(a) Permit Allowing Incidental Take of the Endangered Tooth Cave Ground Beetle (*Rhadine persephone*) and Bee Creek Cave Harvestman (*Texella reddelli*) During Construction and Operation of a Regional Shopping Mall near Austin, Williamson County, Texas.

Unit of Fish and Wildlife Service Proposing Action: Permits Branch, Office of Management Authority, U.S. Fish and Wildlife Service, Washington, D.C. 20038-7329.

Legal Mandate for Proposed Action: Endangered Species Act of 1973, as amended, Section 10(a), as implemented by 50 CFR 17.22 for Endangered Species.

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1.0

PURPOSE AND NEED FOR ACTION

The purpose of this Environmental Assessment is to comply with the National Environmental Policy Act (NEPA) and to evaluate the environmental impacts of the project. The assessment is required because of the proposed issuance of a Section 10(a) incidental take permit by the U.S. Fish and Wildlife Service (Service) pursuant to the Endangered Species Act of 1973, as amended (Act). H. Co. Simon Lakeline Mall Partnership (the applicant) proposes to develop a regional shopping mall on an approximate 116-acre site in northwest Austin, Williamson County, Texas. The proposed LakeLine Mall site is located near U.S. 183 and FM 620 (Figure 1). The proposed mall development consists of a two-level structure with approximately 1.1 million square feet of leasable space surrounded by parking lots to provide the number of parking spaces required by the City of Austin. The mall and parking lot areas occupy approximately 78 acres. The remaining 38 acres of the 116-acre tract are in development reserves around the perimeter of the mall.

The Applicant has submitted an application for a permit to allow the incidental take of the Federally-listed Tooth Cave ground beetle (*Rhadine persephone*) and Bee Creek Cave harvestman (*Texella reddelli*) which have been identified to occur on the proposed mall site. The implementing regulations for Section 10(a) of the Act, as provided by 50 CFR 17.22, specify the criteria by which a permit allowing the incidental "take" of listed endangered species pursuant to otherwise lawful activities may be obtained. The purpose and need for the Section 10(a) permit is to ensure that incidental taking resulting from the proposed mall project will be minimized and mitigated to the maximum extent practicable and will not appreciably reduce the likelihood of the survival and recovery of these listed species in the wild.

2.0

DESCRIPTION OF THE AFFECTED ENVIRONMENT

2.1

VEGETATION

The proposed mall site is characterized by a mixture of moderate to sparse woodlands and interspersed grassland. The woodlands are dominated by plateau live oak (*Quercus fusiformis*), post oak (*Q. stellata*), cedar elm (*Ulmus crassifolia*), and Ashe juniper (*Juniperus ashei*). Other occasional tree and shrub species include hackberry (*Celtis laevigata*), bumelia (*Bumelia lanuginosa*), Texas persimmon (*Diospyros texana*), elbow bush (*Forestiera pubescens*), and yaupon (*Ilex vomitoria*).

Grassland areas are vegetated largely with silver bluestem (*Bothriochloa saccharoides*), little bluestem (*Schizacharium scoparium*), three awn (*Aristida sp.*), other grasses and miscellaneous forbs.

2.2

WILDLIFE

The area surrounding the proposed mall site has been generally urbanized over the past 15 to 20 years. Wildlife of the area is typical of urban settings with open space. The mall site, however, is included in a largely undeveloped area of about 400 acres which due to its size still maintains populations of non-urban wildlife. Common bird species include the northern mockingbird (*Mimus polyglottos*), northern cardinal (*Cardinalis cardinalis*), tufted titmouse (*Parus bicolor*), scrub jay (*Aphelocoma coerulescens*), and Carolina chickadee (*Parus carolinensis*). Mammals include the white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), fox squirrel (*Sciurus niger*), eastern cottontail (*Sylvilagus floridanus*), and nine-banded armadillo

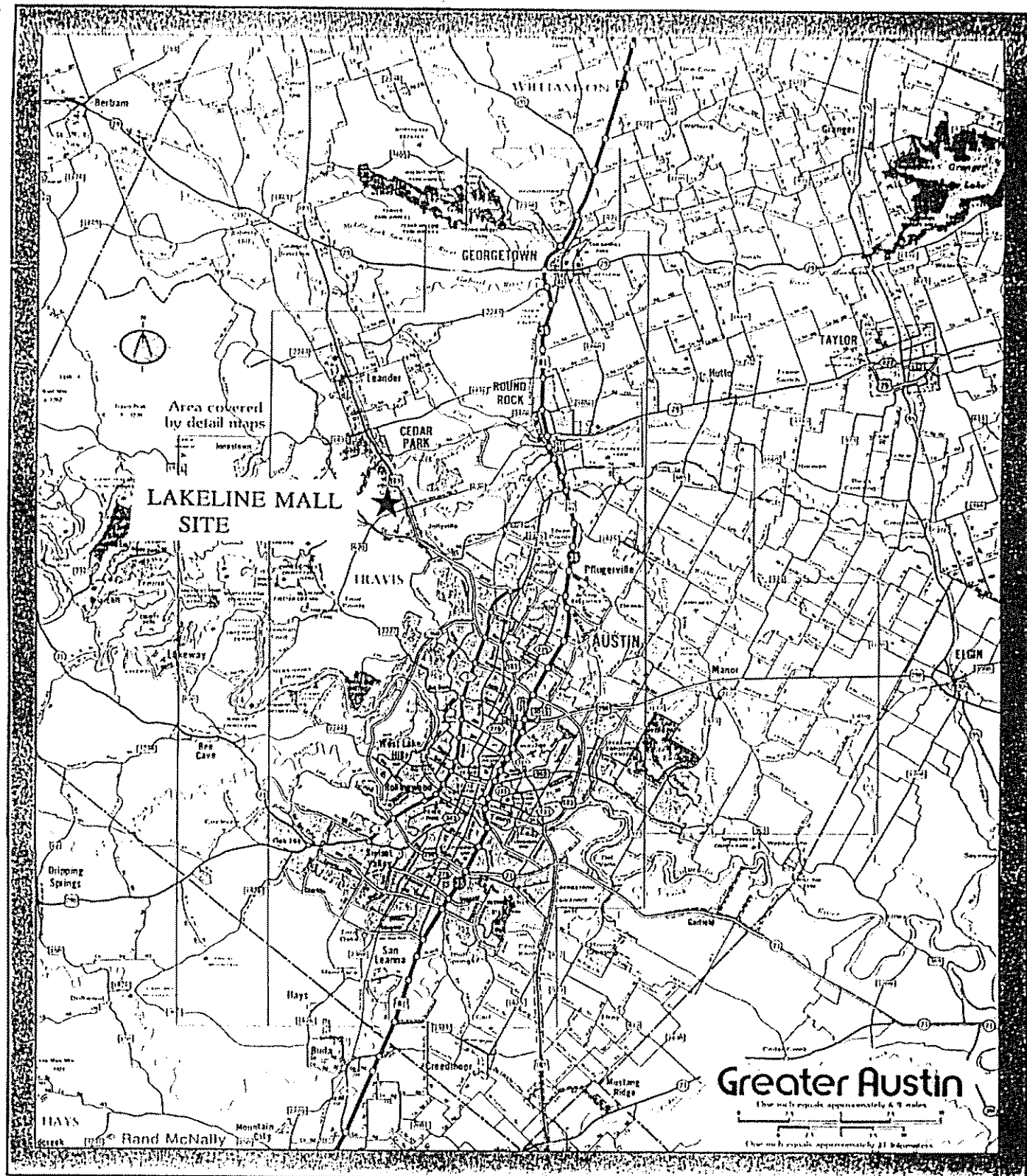


FIGURE 1
LOCATION MAP

Horizon

ENVIRONMENTAL SERVICES, INC.

(*Dasypus novemcinctus*). Herpetofauna includes largely terrestrial reptiles such as the Texas rat snake (*Elaphe obsoleta*), western diamond-back rattlesnake (*Crotalus atrox*), southern copperhead (*Agkistrodon contortrix*), and northern fence lizard (*Sceloporus undulatus*).

2.3 THREATENED OR ENDANGERED SPECIES

Within the Williamson and Travis County area, seven vertebrate and invertebrate species are listed as endangered by the Service. Two bird species, the golden-cheeked warbler (*Dendroica chrysoparia*) and black-capped vireo (*Vireo atricapilla*), and five cave dwelling invertebrates, the Tooth Cave ground beetle (*Rhadine persephone*), Bee Creek Cave harvestman (*Texella reddelli*), Tooth Cave spider (*Neoleptoneta myopica*), Tooth Cave pseudoscorpion (*Microcreagris texana*), and Kretschmarr Cave mold beetle (*Texamaurops reddelli*) have been placed on the federal endangered species list since 1987.

The golden-cheeked warbler occupies dense, mature oak-juniper woodland while the black-capped vireo typically occupies dense, low hardwood shrubs. Suitable habitat for either bird is not present on the proposed mall site. Neither of the birds have been observed to occur in the vicinity. The seven endangered cave invertebrates occur within a karstified geologic region known as the Jollyville Plateau, northern, and southern Edwards formation. These highly endemic species were placed on the federal endangered species list in 1988 (Federal Register, September 16, 1988, Volume 53, Number 180 page 36029) as a result of concern for the potential extirpation of one or more of these species due to their very limited distribution and eminent threats of cave destruction from rapid development that occurred in the area during the early 1980's. Nearly all known occurrences of the species in 1988 were on privately held property subject to development. At time of listing, the species were only known from about six humanly enterable caves (Figure 2). Since the time of listing, additional research in the region has proved that the Tooth Cave ground beetle and Bee Creek Cave harvestman are more widespread than previously thought, but still have a generally restricted range with most known occurrences being on private property subject to development activity.

Biological investigations of several karst features on and near the mall site were initiated in February of 1990. Two (2) of the endangered invertebrate species, the Tooth Cave ground beetle and the Bee Creek Cave harvestman were initially confirmed to be present in LakeLine Cave (Horizon, 1990). LakeLine Cave is located on development reserve lands approximately 70 feet outside of the mall site proper. In response to additional concern expressed by the Service and several conservation groups that other endangered invertebrates might yet occur in association with any of numerous other known karst features or unknown subterranean voids on the site, additional investigations were instituted during October 1990. The additional investigations included excavations of nine additional karst features chosen at random across the site and installation of corings with baited traps into subsurface voids. The additional investigations revealed the presence of the Tooth Cave ground beetle in one (1) additional location and also the Bee Creek Cave harvestman in another location on the mall site (Horizon, 1991). To date, none of the other listed cave invertebrates have been found on or near the mall site and are not generally expected to occur there.

2.4 WETLANDS

No areas defined as wetlands according to the Manual for Identifying and Delineating Jurisdictional Wetlands (1989) are present on the proposed mall site. Additionally, no other areas subject to jurisdiction under

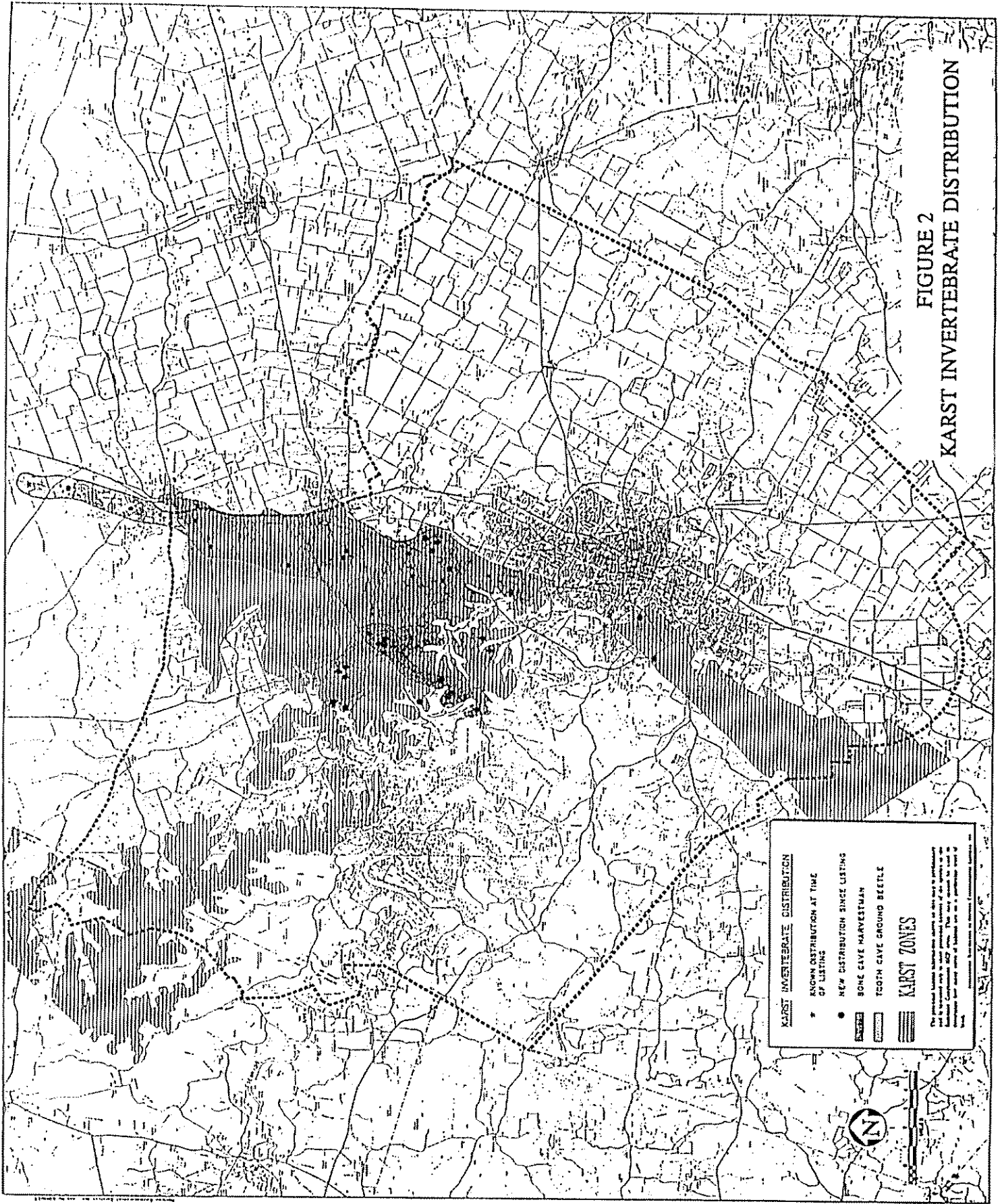


FIGURE 2
KARST INVERTEBRATE DISTRIBUTION

Section 404 of the Clean Water Act are present on the site.

2.5 GEOLOGY/SOILS

The proposed mall site is located within a geologic area known as the Jollyville Plateau. The Jollyville Plateau is an irregularly shaped peninsula of Edwards Limestone, roughly five miles square, which is contiguous with, but geohydrologically dissected from the expansive northern Edwards Aquifer Recharge Zone to the north and northeast. The Jollyville Plateau is a highly eroded non-water-bearing remnant of a former water-bearing aquifer area. Karstification within the area occurred hundreds of thousands or perhaps millions of years ago by dissolution activity during the water-bearing stages. Erosion of the limestone over this period has resulted in a thin remnant cap (generally less than 50 feet thick) of karstified Edwards limestone in which numerous voids are now exposed at the surface.

The Edwards in this region is generally underlain by less permeable and less karsted formations such as the Comanche Peak and Walnut.

Soils on the proposed mall site include 4 mapped soil series according to the Soil Conservation Service (SCS, 1983). The series include the Eckrant extremely stony clay, Georgetown stony clay loam, Crawford clay, and Fairlie clay.

The Eckrant series is the shallowest soil on the site with typical thicknesses of up to 11 inches to the underlying limestone. Numerous limestone exposures occur throughout this series. Topography of this soil is nearly level to gently sloping on broad ridges and in shallow valleys in uplands.

The Crawford clay is the next thinnest soil on the site with typical thicknesses of up to 27 inches. This soil is typical on gently sloping mesas, foot slopes, and at the head of drainage ways on uplands.

The Georgetown stony clay loam is gently sloping on the higher parts of uplands. Typical soil thickness to the limestone base is up to 35 inches. Fractures and crevices in the underlying limestone are typically filled with clay loam.

The Fairlie clay is gently sloping along broad flats and on edges of drainage ways on uplands. Soil thickness is usually up to about 46 inches.

2.6 LAND USE

The general vicinity of the proposed mall site is an urban setting with residential areas to the north, south and west and commercial/retail development along the U.S. 183 corridor to the east. The mall site is situated within an area of about 400 acres that has been developed with infrastructure (roads, utilities, etc.), but is as yet not developed out.

The proposed LakeLine Mall site was incorporated into a Road Utility District (RUD) in the mid-1980's, a local taxing entity established to provide improved roadways to developing areas that were otherwise outside of local municipality jurisdictions for such capital improvements. The RUD committed in 1987 to build improved roadways and extend utility service in the vicinity of the mall site in anticipation that the mall and other development would contribute significantly to recovery of indebtedness. Completed roadways and utilities surround the mall site as well as extend to other existing developments in the vicinity. The mall site proper has experienced varying levels of disturbance in various areas, primarily stockpiles of excess excavation materials from surrounding construction projects anticipated to be utilized for fill materials in mall construction.

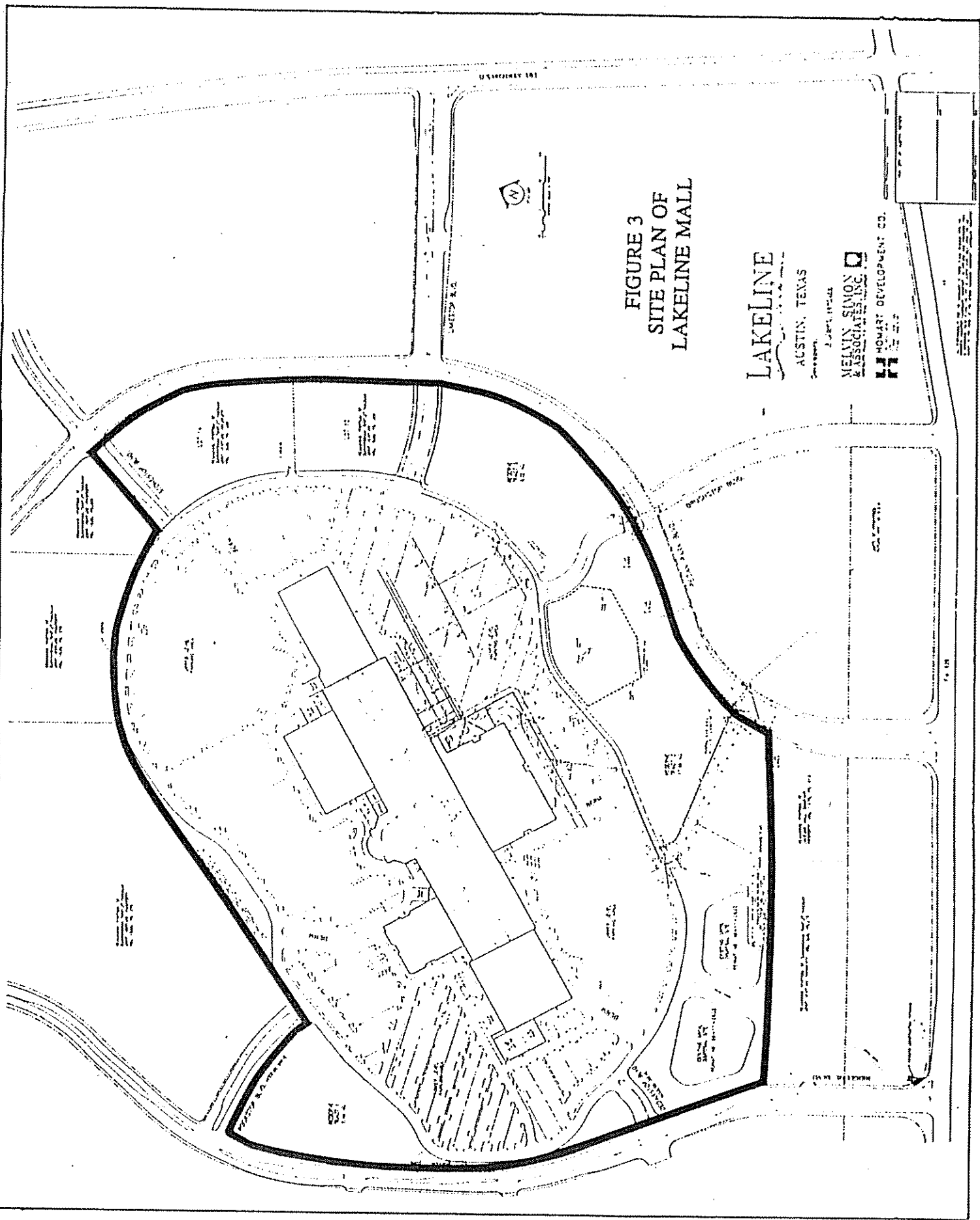


FIGURE 3
SITE PLAN OF
LAKELINE MALL

LAKELINE

AUSTIN, TEXAS

MELVIN SIMON
ASSOCIATES, INC.

HOWARD DEVELOPMENT CO.

These stockpiles were previously approved by City of Austin site development regulations.

2.7 AIR QUALITY

Williamson and Travis counties and the Austin metropolitan area are currently full attainment areas for all air quality criteria pollutants of the EPA and Texas Air Control Board. Potential degradation of air quality in the Austin metro area has been a topic of discussion over the past decade.

2.8 WATER QUALITY

Water quality on the proposed mall site is presently estimated to be good due to the generally well developed vegetative cover. No permanent surface water exists on the site. The Edwards limestone on the site is non-water bearing.

The proposed mall site has existing City of Austin central wastewater infrastructure. The site drains to Brushy Creek via Lake Creek and Buttercup Creek. Brushy Creek downstream of the site is listed as a non-compliance stream unsuitable for contact recreation by the Texas Water Commission due primarily to discharges from a large number of small wastewater treatment plants in the upper watershed to serve various developments. A regionalized wastewater collection and treatment system for the Brushy Creek watershed that will alleviate the numerous small plants has not been completed.

2.9 CULTURAL RESOURCES

A review of the files of the Texas Historical Commission has not revealed the presence of any cultural resource sites listed on or eligible for the National Register of Historic Places on or within the vicinity of the proposed mall site.

3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section presents details of the proposed action and the reasonably practicable alternatives that have been considered. The alternatives include: (1) proposed (preferred) action; (2) selection of an alternate site; (3) modification of site design and layout; (4) waiting on approval of the BCCP regional 10(a) permit; and (5) no action. The environmental consequences of these various alternatives are presented in Section 4.0.

3.1 ALTERNATIVE 1 - PROPOSED (PREFERRED) ACTION

The proposed action is the issuance of a permit under Section 10(a) of the Act to authorize the incidental take of the endangered Tooth Cave ground beetle and Bee Creek Cave harvestman during the construction and operation of LakeLine Mall and adjacent development on the 116-acre site. Nearly the entire 116-acre site will be subject to disturbance and modifications during development, however, the completed developments will result in at least 10% of the site to remain in a landscaped condition. As per requirements of the City of Austin Land Development Code, filtration and sedimentation basins are to be constructed to capture and filter the first one-half inch of rainfall runoff from impervious surfaces.

The proposed mall will consist of a two-level structure containing approximately 1.1 million square feet of leasable space surrounded by parking lots to provide the number of parking spaces required by the City of Austin. The mall and parking lot areas occupy approximately 78 acres. The remaining 38 acres of the 116-acre site are planned for coincident commercial/retail development for which no specific plans have yet been developed. However, the coincident development will comply with all City of Austin development standards for impervious cover and landscaping.

Earthwork activities within the Lakeline Mall outer ring road include some excavation for construction of the lower level parking areas and utility installations. In addition, earth filling will take place for construction of the upper level parking areas. Excavation trenches will also be necessary for installing utilities.

Excavation grading of the eastern lower parking area will taper from an approximate depth of 6 feet near the building exterior up to existing grade toward the outer ring road (Figure 3). Likewise, grading in the lower western parking area will vary from 1 to 3 feet in depth. The greatest excavation in this area will occur near the southern berm and Cedarstop Blvd. tapering to existing grade toward the north. Excavation under the mall building will occur for installation of foundations. Some subsurface voids may need to be filled to provide a stabilized foundation base.

Earth fill will take place for upper level parking between the berms on the northern and southern ends of the site. Fill on the northern upper level parking area will taper from existing grade on the northeastern side near the outer ring road to approximately 20 feet near the building and berm on the western side. Fill between the berms on the southern upper level parking area will vary from existing grade near the southern berm at the outer ring road to approximately 10 feet near the building and eastern berm.

Excavation trenching will be necessary for installation of utilities such as on-site water, sewer, drainage, gas, electric, and telephone lines. Current geologic information on the nature of the underlying rock suggests that conventional trenching by machine may be used in lieu of trench cutting and blasting.

Silt fences will be installed around the perimeter of the site prior to any earthwork activities. Two sedimentation basins will be constructed early in the project to provide treatment of stormwater per City of Austin stormwater treatment standards.

A multi-faceted conservation plan has been developed as part of the preferred alternative as mitigation for the incidental taking of the Tooth Cave ground beetle and Bee Creek Cave harvestman. The conservation plan includes the following features:

- o Acquisition of karst preserve lands and known cave locations for the Tooth Cave ground beetle and Bee Creek Cave harvestman.
- o Ten-year research/monitoring program for LakeLine Cave and commensurate 5-year study of two off-site caves.
- o Preserve site investigations and characterizations
- o Preserve area management funding and support
- o Monetary contribution of \$40,000 for discretionary use to the BCCP
- o Karst ecosystem exhibit for educational purposes
- o Fire ant control on the preserve lands for the life of the permit.

The karst preserve lands are to be acquired for the long-term protective management of known populations of the Tooth Cave ground beetle, Bee Creek Cave harvestman, and their associated ecosystems.

In addition to the karst preserve land acquisition and dedication, the Applicant will also sponsor scientific research activities that are designed to provide biological and environmental information that will contribute to the understanding of the endangered invertebrates' life histories and, thus, their management and conservation requirements. This research is intended to provide biological information to enhance the long-term survival and recovery of the species. The research activities include monitoring programs for LakeLine Cave and mitigation lands.

The Applicant will also provide funding support in the amount of \$40,000 to the BCCP regional planning effort to further its progress toward completion and approval. The regional plan is being designed to provide long-term protection and enhancement of all the endangered species in the Austin area and, therefore, the Applicant's funding support will contribute to that overall preservation and enhancement goal.

The Applicant will provide an endowment for long-term management of the karst preserve areas. This management annuity will amount to \$50,000 for the life of the permit.

The applicant is additionally committed to further enhance the conservation and recovery of the species by providing a karst ecosystem educational exhibit within the mall development. The educational exhibit will aid the understanding of the importance and uniqueness of the karst systems and the associated biota which will increase awareness of conservation needs and bolster public support for such actions. The exhibit is to be developed in coordination with karst ecosystem research personnel and various conservation organizations.

Details of the mitigation are provided in the LakeLine HCP. Guarantees for implementation are provided in the Agreement and the Management Agreement. These conservation plan actions ensure that the criteria established for issuance of an incidental take permit will be fully satisfied.

3.2 ALTERNATIVE 2 - ALTERNATE SITE LOCATION

In considering possible alternative sites, it should be noted that the mall development plan was conceived prior to 1985. The City of Austin, Williamson County, and the RUD have participated in extending public utilities and services (water lines, sewers, roadways, etc.) to the development site. Most of this predevelopment utility work was accomplished or initiated before the September 1988 listing of the Tooth Cave ground beetle and Bee Creek Cave harvestman as endangered species.

An analysis of the Austin, Texas retail market has shown that the proposed LakeLine Mall will serve a trade area as shown in Figure 4. Possible locations of a retail mall to adequately serve the trade area are based on many factors. Some of these factors include:

1. Population density and growth.
2. Location and type of existing retail developments in the area.
3. Accessibility within the retail market area.
4. Accessibility and visibility from a major highway.
5. Availability of utility service.
6. Current zoning and land use.
7. Size, shape and topographic characteristics of the property.

Accessibility within the available retail trade area is a significant factor for determining potential sites. The proposed site adjacent to

Highway 620 and Highway 183 is important to the success of a regional mall in this market area for the following reasons:

- o The site is located at a major interchange. Highway 183 is a major north/south artery running through the entire Austin metropolitan area. Highway 620 provides east/west access in the northern Austin market.
- o Planned road improvements enhance this interchange though they are not necessary for the success of the mall project. Highway 620 will be incorporated into the planned outer loop which will run from northwest Austin around to south Austin. Highway 183, along with 620, will become six (6) lane, limited access highways.
- o This area has been targeted by the City of Austin and Williamson County for development for several years with the extension of utilities (water lines, sewers, roadways, etc.) at considerable expense to the Road Utility District. Much of this work was done before the listing of the endangered cave invertebrates. The City of Austin has issued site plan approval to the applicant for LakeLine Mall.
- o Trade area analysis for the local area indicates that an adequate population base already exists to support the mall project. In addition, however, north and northwest Austin are the fastest growing regions in the metro area. The LakeLine Mall trade area, which encompasses these regions is projected to grow at a rate of 4.7% annually over the next five (5) years. The LakeLine Mall site would also be able to serve this increasing population base.

Based on the access provided today and the improved access that is anticipated to be provided, as well as the strong growth and lack of quality shopping alternatives in north Austin, this location is very desirable for a shopping center development.

As can be seen in Figure 4, the karst zones in north Austin lie in a wide area which encompass not only the proposed site, but a large portion of the trade area as well. Concerns for endangered cave invertebrates would potentially remain for development proposed within any area of this karst zone.

In keeping with the general siting criteria for a regional mall discussed above (i.e., located at an intersection of major transportation arteries; presence of on-site or nearby infrastructure such as water and wastewater utilities, service roads, etc.; sufficient distance from other malls; centralized location to the target population base; and reasonably commensurate adjacent development), four (4) alternative sites were evaluated for location of the mall generally in the four (4) cardinal directions from the proposed site. The alternate sites are indicated on Figure 4.

North - The next major intersection along US 183 north of the proposed site is at 183 and 1431 in Cedar Park.

South - The next intersection of major roadways to the south of the site is at 183 and Loop 360.

West - To the west of the site, the next large intersection is HWY 620 and RM 2222.

East - Eastward of the proposed site is the intersection of Farmer Ln. and HWY 620.

The rationale for rejection of these alternate locations are provided in Section 4.2.

Lakeline Mall Austin, Texas

FIGURE 4
LAKELINE MALL TRADE AREA

SIMON
THE LUNDY GROUP, INC.



Karst Zones

AUSTIN, TEXAS

1989 - 1994

Projected Growth in Population

1 Dot = 20 People

April, 1990

Data By: The Lundy Group, Inc.

SIMON

3.3 ALTERNATIVE 3 - ALTERNATE SITE LAYOUT

This alternative would involve the overall reduction in size and/or rearrangement of the mall on portions of the LakeLine site (western ½) which has a low probability for the occurrence of subsurface voids and endangered cave invertebrates (see discussion at Section 4.1.1.3). The rationale for rejection of this alternative is presented in Section 4.3.

3.4 ALTERNATIVE 4 - WAIT ON THE REGIONAL 10(a) PERMIT

This alternative assumes that the applicant could wait on the completion and implementation of the BCCP regional 10(a) permit for initiation of mall construction. The rationale for rejection of this alternative is presented in Section 4.4.

3.5 ALTERNATIVE 5 - NO ACTION ALTERNATIVE

This alternative assumes that the mall project is dropped and no 10(a) permit is applied for by the applicant. A discussion of the ramifications of this alternative is provided in Section 4.5.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 ALTERNATIVE 1 - PROPOSED (PREFERRED) ACTION

4.1.1 On-Site Impact Analysis

4.1.1.1 Vegetation

The proposed action of permit issuance will result in the significant surface alteration to 116 acres of the mall site. Most of the vegetative resources of the 78-acre mall will be removed during construction except for various trees that have been identified for preservation in the landscape and the 2.3-acre LakeLine Cave research area. However, landscaping will be returned to the site within medians and designated landscape areas. Finished landscaping will occupy approximately 10% of the mall site. No specific construction plans have been developed for the remaining 38 acres, however, development on that acreage would follow the City of Austin Land Development Code requirements for vegetative preservation and landscape restoration.

4.1.1.2 Wildlife

Wildlife on most of the 116-acre tract would be largely displaced to adjacent areas. Remnant trees and the proposed landscaping would provide habitat for various urban species of birds. The 2.3-acre LakeLine Cave research area would be left in its natural state for five years and would be expected to maintain some of the small wildlife species it currently supports such as birds, squirrels, field rodents, and herpetofauna. Deer and other larger mammals would be expected to leave the area during construction.

4.1.1.3 Endangered Species

Potential Habitat

Due to the subterranean nature of the karst invertebrates, a determination as to the specific quantities of endangered invertebrates to be taken cannot be made. The best method of assessing take at this time is based on total acreage of potentially suitable karst habitat. Numerous factors have been considered in determining an area of potential take on the LakeLine Mall site. Potential take is based on the best estimate of the potential occurrence of suitable habitat (subsurface voids). The evidence utilized to determine the potential distribution of subsurface voids includes geotechnical coring results, distribution of surface karst features, and surface soil thickness, and soil types. Evaluation of this evidence gathered on-site and in the area suggests that the approximate eastern 1/2 of the site (about 62 acres) exhibits the only real potential for the occurrence of voids with suitable habitat. This impact determination is based on the following information.

Corings to a depth of twenty-five (25) feet or greater have been drilled on the site by Woodruff (1986), Raba-Kistner-Brytest (1987), and Horizon (1991), (Figure 5). Eleven (11) cores were drilled by Woodruff for geohydrological testing purposes. Fifteen (15) cores were installed by Raba-Kistner-Brytest for geotechnical testing. Six (6) cores were installed by Horizon for biological testing. Of these thirty-two (32) cores drilled across the entire site, seventeen (17) encountered subsurface void spaces. All seventeen (17) cores encountering voids were on the eastern 1/2 of the site. Cores which did not encounter voids were distributed across the site.

Surface karst features e.g., (sinks, enlarged fissures, and caves) were originally located and mapped by Dr. Charles Woodruff (1986), (Figure 6). The survey included an area larger than the mall site proper. Woodruff differentiated between major karst features (generally larger than 3 feet diameter) and micro karst features (less than 3 feet diameter). Woodruff mapped a total of sixteen (16) major karst features (11 on the mall site) and seventy-one (71) micro karst features (about 45 on the mall site). All of the significant karst features were on the eastern 1/2 of the site. About 86% (61 of 71) of the micro karst features were on the eastern 1/2 of the property.

During the last karst feature investigation by Horizon on the mall site, various karst features were excavated and evaluated for potential habitat. Six (6) features at least showed some initial promise of subsurface void space. Of these six (6), one produced a 10-foot deep pit with a small bedding plane void. Another resulted in a twelve-foot deep pit with a large bedding plane void (Underline Cave). Only Underline Cave produced any troglobitic fauna including the Bee Creek Cave harvestman. All six (6) of the features showing at least some habitat potential were on the eastern 1/2 of the mall tract. The three (3) micro features excavated on the west side of the tract were all very small and shallow and were completely soil filled to the maximum depth of excavation. These features were characteristic of the few scattered features observed on the west side of the tract by Horizon. These features did not exhibit suitable habitat characteristics for cave invertebrates.

Soil cover would appear to be a major factor in indicating where significant voids might be found. As a general rule, the thinner the soil, the more likelihood of finding significant karst features and subsurface voids. It should be noted that all but (1) one of the known endangered species caves in Williamson County occur within the Eckrant soil series which is described as very shallow (0 to 13 inches) with many limestone exposures. Shallow soil conditions would tend to develop as a result of increased erosion or prevention of significant deposition from differential geological, topographical, and meteorological conditions. The presence of a shallow soil would also reduce the amount of soil material that is washed into caves and

FIGURE 5
DISTRIBUTION OF
ONSITE CORINGS

- CORES WITH VOIDS
- CORES WITHOUT VOIDS

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AUSTIN, TEXAS

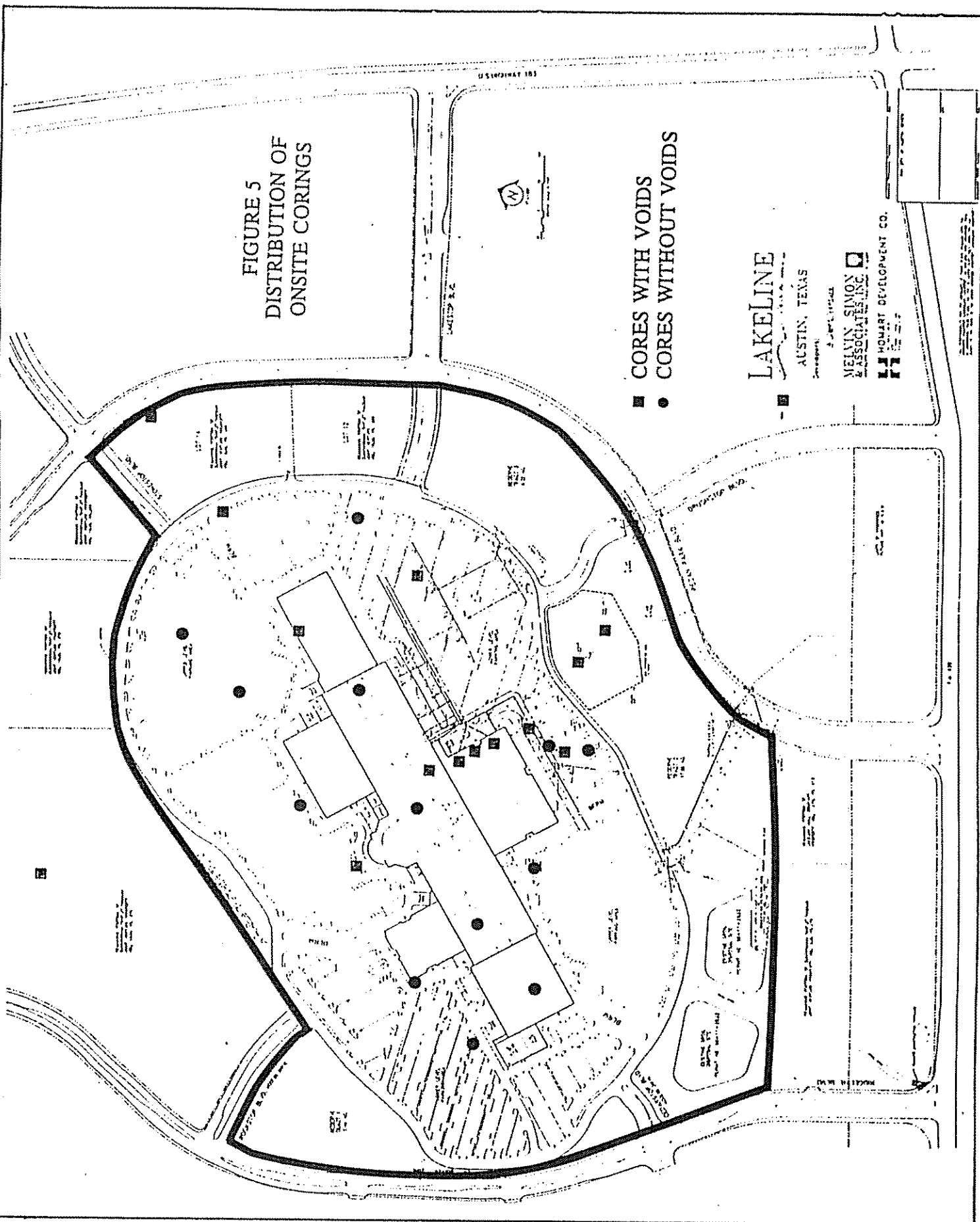
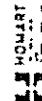
Development

2-10-82, 1-10-84

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& ASSOCIATES, INC.



HOMART DEVELOPMENT CO.



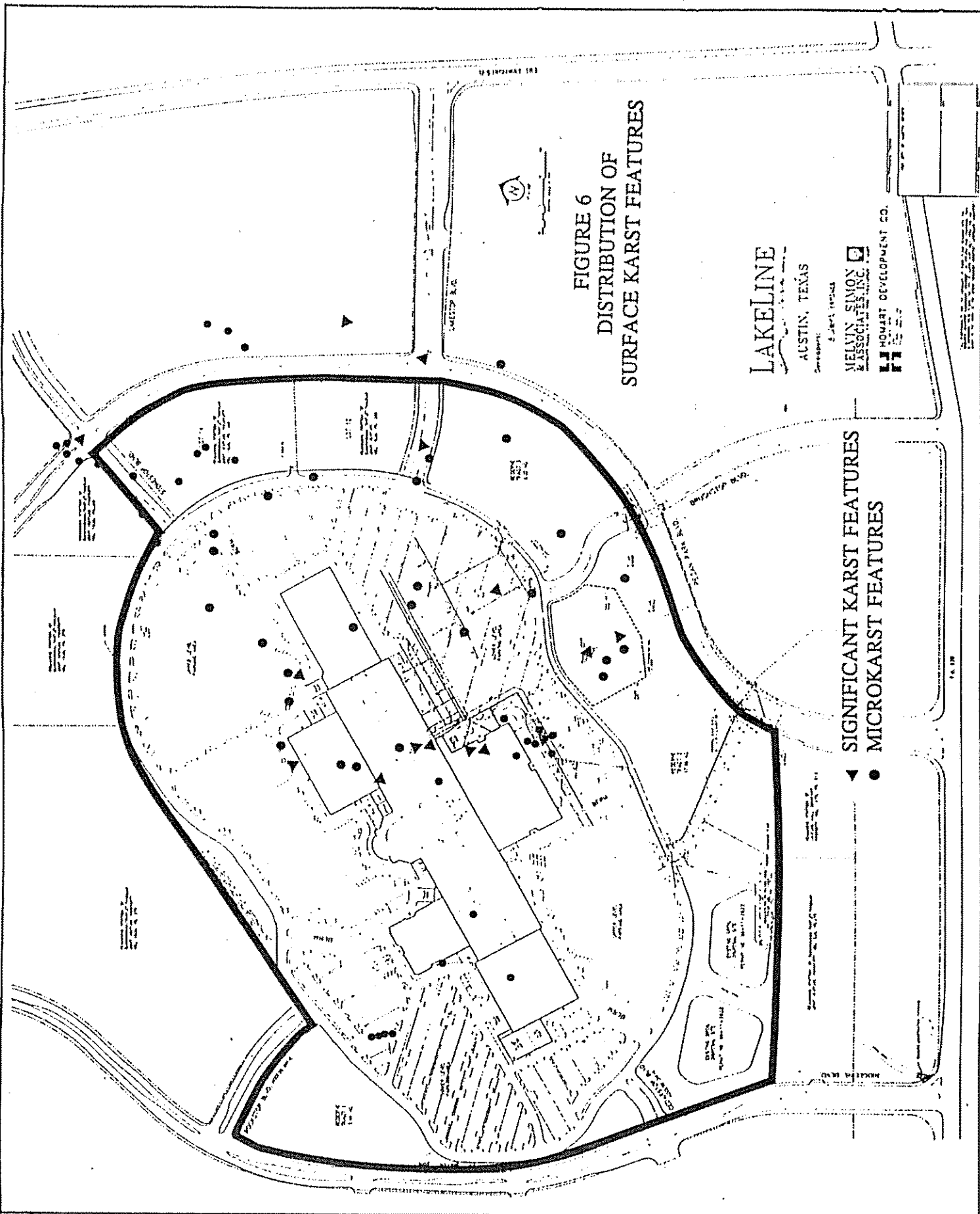


FIGURE 7
DISTRIBUTION OF
SOIL DEPTHS

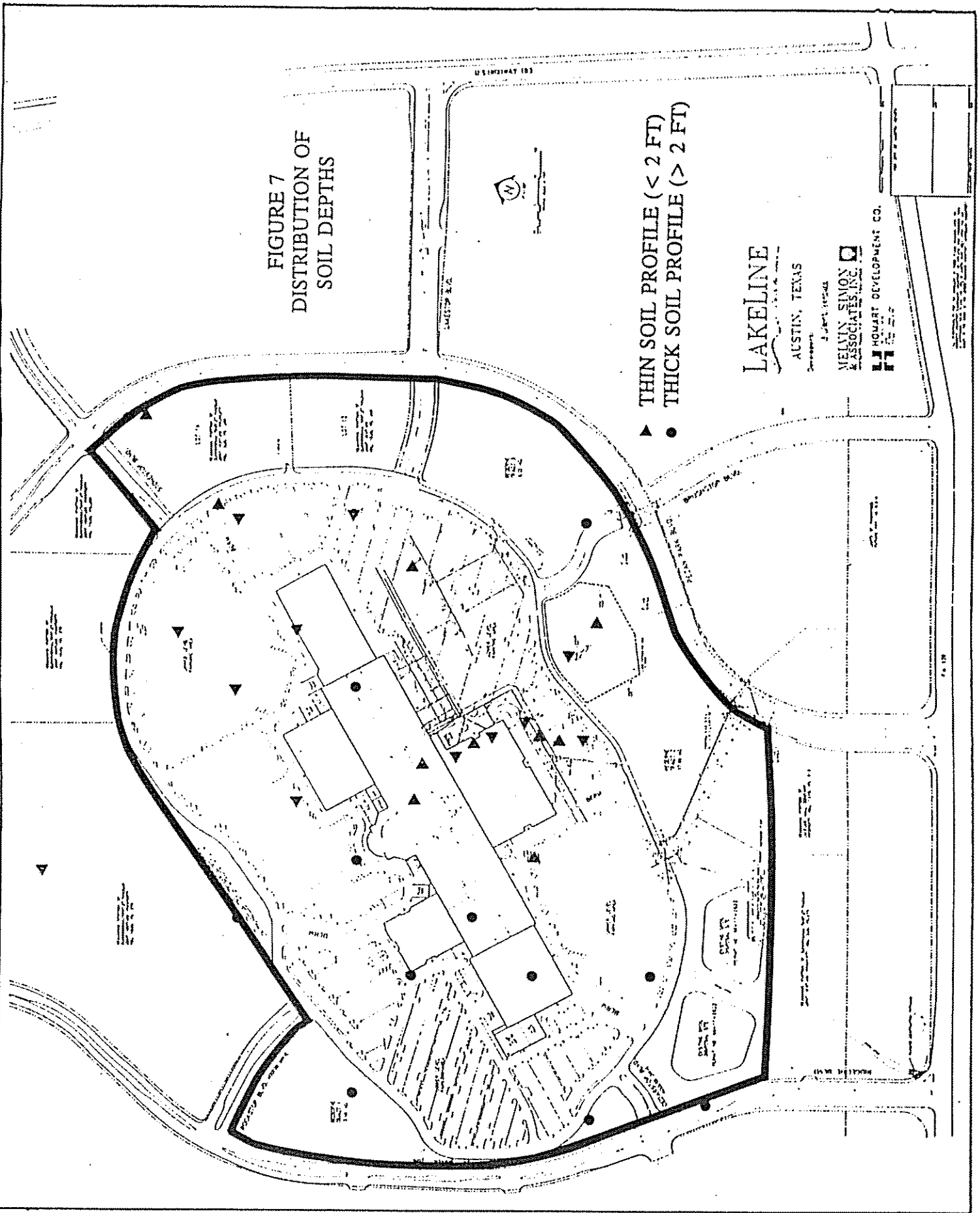
- ▲ THIN SOIL PROFILE (< 2 FT)
- THICK SOIL PROFILE (> 2 FT)

LAKELINE

AUSTIN, TEXAS

MELVIN SIMON
& ASSOCIATES, INC.

L.J. HOWART DEVELOPMENT CO.



sinks. On the western portion of the mall site, soils range in thickness from three (3) to eight (8) feet (Figure 7). With this extent of soil cover, any subsurface voids would likely be clay filled by virtue of downward movement of the finer particles through cracks and fissures. On the eastern portion of the site, soils are very shallow (0 to less than 3 feet thickness), and there is significant limestone exposure at the surface. This area generally corresponds with the Eckrant soil series mapped by the SCS.

The predominance of indications of subsurface voiding is skewed to the eastern 1/2 of the mall site. Little or no evidence of significant voiding is present for the western side of the tract, and any enlargements of cracks, fissures or bedding planes that would occur on that portion of the site would very likely be clay filled and provide no suitable habitat for invertebrates.

Therefore, the eastern 1/2 of the site or about sixty-two (62) acres forms the basis for defining the area of potential take. Since subsurface voids do not universally exist across this 62-acre portion of the site, as shown by geotechnical coring results, the area of potential take would be no greater than 62 acres.

Within this area of take, a total of two identified occurrences of the endangered species (Underline Cave and Well Trap location #6) would be immediately impacted. LakeLine Cave is to be conserved and monitored for the initial five-year research period and then assumed to be taken when the conservation area is reduced to 0.5 acres. The monitoring program for the next five years would be to identify the changes in environmental conditions in the cave as a result of the surface alteration.

Potential Impact

For the Bee Creek Cave harvestman, the impact would be limited because it is known to occur in 40 separate localities. Other localities may be found as the lands within the range of these localities are surveyed. Secondly, in both LakeLine Cave and Underline Cave, few individuals of the species have been observed in each cave despite numerous investigations.

For the Tooth Cave ground beetle, eighteen (18) separate locations are presently known, but several other locations within the range of these locations are suspected, particularly in the Buttercup Creek area. Additionally, the results of the coring study on the LakeLine site indicates that the ground beetle is present in subsurface voids without surface features or significant openings.

As a probable result of the land disturbances that have previously occurred on and around the mall site, there has been infestation of the site by the imported fire ant (*Solenopsis invicta*). Fire ants have been recently observed to invade endangered species caves and cause potentially severe perturbations including observed predation on endangered species (Reddell, pers. comm., 1991). The fire ant is a hardy and prolific species and the continued existence of the endangered invertebrates may not be compatible with the presence of fire ants in the long-term. LakeLine Cave was noted during the Summer of 1990, to have become heavily infested by fire ants. The area around the cave was carefully treated with Amdro in October 1990, and a subsequent investigation of the cave revealed a marked decline in the ants. A general absence of other fauna was also noted, although, the potential impact of the fire ant invasion has not been assessed in depth. A recent investigation of LakeLine Cave in April 1991 (Elliott, 1991) revealed a low population of ants and good cave fauna populations, including the Tooth Cave ground beetle and Bee Creek Cave harvestman. The potential impact of fire ants on troglobites and the endangered species in other locations on the mall site is not definitely known.

It might also be noted for both species that while it is suspected development activities may result in a complete taking of extant populations within the 116-acre development site, it has not been positively confirmed if such development is totally detrimental. At least 10% of the site will

be maintained in a landscaped nature which will allow water and nutrient infiltration to the subsurface. Landscaping will be nearly equally distributed across the site per requirements of the City of Austin Landscape Ordinance. This could potentially support subterranean faunal populations, including the endangered species. Therefore, the impact of the proposed activity may not result in a complete taking.

4.1.1.4 Wetlands

No wetlands or other areas subject to jurisdiction under Section 404 of the Clean Water Act will be impacted.

4.1.1.5 Geology/Soils

The Edwards limestone formation on which the mall is located is non-water bearing and is not connected hydrologically with the Edwards Aquifer. Therefore, no significant groundwater resources will be impacted by the proposed mall. Various karst features within the mall building area may necessitate filling or grouting, particularly under the building footprint for foundation stability. Nearly all native soils on the site will be removed or disturbed during the construction process. Native soils will be retained within the construction area around trees that have been identified to remain in the landscape.

4.1.1.6 Land Use

The proposed site and adjacent properties have been targeted for commercial/retail development since the early 1980's. The site has been zoned and permitted by the City of Austin for a major commercial/retail development, specifically including the proposed mall. Auxiliary roads, and water and wastewater infrastructure have been constructed around the mall site in anticipation of its construction. The proposed mall is completely compatible and complementary to the existing and proposed future land uses of the general area.

4.1.1.7 Air Quality

A temporary increase of fugitive dust emissions and noise will be expected during construction of the mall. However, these increases can be minimized by prudent dust control (watering of exposed dust sources) and timing of construction activities for normal activity hours.

After the mall is constructed, parking facilities will permit a concentration of vehicles on the property with no expected detrimental effect.

4.1.1.8 Water Quality

No significant impacts are expected from runoff from the developed site. Per City of Austin water quality maintenance requirements, erosion and sedimentation will be controlled during construction. The first $\frac{1}{4}$ inch of rainfall from all impervious surfaces of the completed development will also be treated within designed filtration and sedimentation basins on site. The mall site is serviced by City of Austin central wastewater service.

4.1.1.9 Cultural Resource

According to the Texas Historical Commission files, cultural resource sites have not been found during surveys of various sites surrounding the mall. Therefore, the mall site would be a low probability area for significant cultural resources.

4.1.2 Off-site Impact Analysis

The proposed mall will not significantly increase overall development in the area beyond that currently existing and planned. As previously noted, the northwest sector of Austin has been in the past, and is expected to continue to be, the fastest growing area of Austin and Travis and Williamson counties (The Lindley Group, Inc.). The proposed mall is a reaction to this growth rather than the impetus for it. Future growth is expected with or without the mall.

4.1.2.1 Vegetation

No off-site impacts are expected.

4.1.2.2. Wildlife

No off-site impacts are expected.

4.1.2.3 Endangered Species

Positive benefits to the endangered karst species and associated karst ecosystems will result from acquisition, conservation and management of the mitigation lands. The mitigation sites, while still in private ownership, are subject to impact from a number of causes. Fire ant infestations are increasing across the Central Texas area in general. Without concerted control measures, as would be applied to the mitigation lands under the conservation plan, the possibility exists for significant fire ant impacts to karst ecosystems, including the endangered species.

The mitigation lands are within projected growth areas and are subject to potential development or land alteration activities. While these lands are still in private ownership, economic pressure on private land owners will continue to favor development of properties.

Even without direct development activities on these now privately-held properties, certain types of activities by landowners or trespassers are potentially detrimental to the karst ecosystems. Trespass dumping and site pollution have occurred in many areas and will likely continue. It has also been reported that rattlesnake roundup activities involving pouring of gasoline into surface karst features to flush snakes out has occurred on many local properties in the past. These potentially detrimental activities would be prevented on the preserve sites with the fencing, posting, and policing provided by the conservation plan.

4.1.2.4 Wetlands

No off-site impacts to wetlands are expected.

4.1.2.5 Geology/soils

No off-site impacts to geologic or soil resources are expected.

4.1.2.6. Land Use

No off-site impacts to land use are expected.

4.1.2.7 Air Quality

The proposed mall will not result in an increase of traffic generated air pollution for the Austin area. A decrease of auto emissions is expected for the region as a whole due to the shortened travel distance and time for shopping patrons within the trade area who now travel an average of 18 to 20 miles to the next closest mall (i.e., Arboretum, North Cross or Barton Creek).

The mall will result in a concentration of vehicles in the immediate vicinity. Over present conditions, however, this increase is not expected to be significant.

4.1.2.8 Water Quality

Potential off-site, indirect water quality impacts would relate to roadway surface runoff pollution (primarily from Hwy. 183, 620 and mall entrance roads) as a result of concentrated traffic flows in the immediate area. Currently, these roadways do not provide any form of runoff pollution control other than vegetated roadside ditches in certain areas. However, all runoff from these roadways currently is contained within various drainage ways and ultimately Lake Creek. The alteration of most of these drainage ways, and particularly Lake Creek channel, has most likely significantly reduced the infiltration of water within these drainage ways into subsurface voids that might potentially contain endangered species. Therefore, this potential off-site, indirect impact is considered very low in probability and magnitude.

4.1.2.9 Cultural Resources

No off-site impacts to cultural resources are expected.

4.1.2.10 Traffic

A traffic impact analysis was prepared in October 1990 by WHM Transportation Engineering Consultants, Inc. of Austin, Texas to assess the impact of the LakeLine Mall project on the quality of traffic flows on the adjacent roadways and at the intersections which will serve the mall. This analysis was conducted as an update to previous studies to take into account a new projected mall opening in 1993 brought about by delays in start of construction.

This analysis considered the following:

1. Arterial roadways and intersection geometrics now in place that were planned for this project and constructed by the Williamson County Road District;

2. Traffic signals to be installed at designated intersections along RM 620 and US 183 approved by the State Department of Highways and Transportation.
3. US 183 frontage roads from south of Pecan Boulevard to north of RM 620 which have been studied and approved for construction by the State Department of Highways and Transportation. The LakeLine traffic phasing agreement, as amended by the Austin City Council on 1/11/90, gives the right to develop 1,644,000 square feet with a corresponding 4,110 peak hour trips without the construction of any additional roadway improvements at the RM 620/US 183 intersection. The LakeLine Mall and outlot development will total less than 1,664,000 square feet. The construction of the 183 frontage roads is not a condition of the City of Austin land development permit for the mall.

With these improvements in place, roadway and intersection capacities will be maintained at acceptable levels of service during the few peak traffic demand periods of the year. Most intersections will have significant reserve capacity, one (1) or two (2) levels of service remaining, for most of the year. No other roadway improvements are necessary for LakeLine Mall.

These analyses show that site generated traffic and forecasted traffic demand upon the roadway network and intersections in the RM 620/US 183 area will serve LakeLine Mall in an efficient and effective manner and facilitate the flow of external traffic movement.

4.1.2.5 Economics

The mall project is anticipated to contribute significantly to the local and State economy as follows:

<u>Property Tax Impact on Williamson County, Texas</u> <u>Attributable to LakeLine Mall</u>		
	<u>Rate</u>	<u>Est. Revenue/yr.</u>
Williamson County:	.0028	\$ 325,000
Round Rock ISD:	.015	\$ 1,742,000
Road District:	.01	\$ 1,162,000
		<u>\$ 3,229,000</u>
Based on Assessed Valuation of \$116,163,000		

<u>Property and Sales Tax Impact on City of Austin, Texas</u> <u>Attributable to LakeLine Mall (Upon Annexation)</u>		
<u>Revenue/yr.</u>	<u>Rate</u>	<u>Est.</u>
Property Tax*	\$.57/1000	\$ 662,000
Sales Tax	1%	\$ 1,990,000
*Based on Assessed Valuation of \$116,163,000		

<u>Sales Tax Impact on Travis County, Texas</u> <u>and State of Texas Attributable to LakeLine Mall</u>		
	<u>Rate</u>	<u>Est. Revenue,</u> <u>1st yr.</u>
1,492,500 Travis County Metro Tax:	3/4%	\$
Texas	6.25%	\$12,437,500
ASSUME 8.2% GROWTH FOR NEXT 10 YEARS		

Employment Impact on Local Area
Attributable to LakeLine Mall

Construction Jobs
Permanent Jobs*

1500
3100

* Full and Part-time

Without construction of the mall project, the following negative economic impacts will occur:

1. The Williamson County Road District has completed extensive infrastructure improvements in the area in anticipations of the mall. The District has spent \$17 million on roadway, sewer, water and drainage improvements. Without LakeLine Mall, the District would be unable to generate revenue necessary to repay this indebtedness, resulting in tax rates too high for remaining property owners to bear. This would make bankruptcy of the Road District likely. Given such a financial condition, additional development within the District would not happen rapidly.
2. Williamson County will not be receiving over \$3.2 million per year in estimated additional property taxes.
3. Travis County and the State of Texas will not receive at least \$1.4 million and \$12.4 million, respectively, of estimated sales taxes per year, and
4. The employment of an estimated 3,100 full and part-time jobs and 1,500 construction jobs will be precluded.

4.2 ALTERNATIVE 2 - ALTERNATE SITE LOCATION

4.2.1 Alternate Site -North- US 183 and FM 1431

This major intersection is still within the karst zone of potential occurrence for the endangered cave invertebrates. The possibility exists for an equal impact to the endangered cave invertebrates by development of the mall at this intersection.

The northwest, southwest, and southeast corners of this intersection already contain residential development. The northeast corner contains a small retail center.

Due to the potential for impact to the endangered cave invertebrates and the existing development, this alternative site is deemed to be non-practicable.

4.2.2 Alternate Site -East- SH 620 and Parmer Lane

Adequate undeveloped acreage exists at this major intersection, however, it is still within the karst zone. Therefore, an equal opportunity for impact to the endangered cave invertebrates exists. This intersection does not currently possess the existing infrastructure or City of Austin approvals for a mall development as does the proposed site. Consequently, this site would provide no distinct advantages to relocation from the standpoint of avoiding endangered species and would require a significant amount of effort, cost, and time to install the necessary infrastructure.

This site is deemed a non-practicable alternative.

4.2.3 Alternate Site -South- US 183 and Loop 360

This intersection is also still within the karst zone which would maintain a potential for impact to endangered species.

The northwest corner of this intersection contains the Arboretum Shopping Center. The southwest corner contains existing residential development. Much of the northeast and southeast corners is in ownership of the University of Texas at Austin as part of the Balcones Research Center.

This alternative is deemed non-practicable.

4.2.4 Alternate Site -West- SH 620 and RR 2222

This intersection is within the karst zone and several endangered species caves are known near this intersection. Each of the four (4) corners also exhibits suitable habitat for the Golden-cheeked Warbler and Black-capped Vireo. Therefore, this alternative is ruled out due to potentially greater impacts to endangered species.

Location of the mall anywhere else within the karst zone which covers a large part of the trade area for the mall would potentially pose an equal possibility of impacting endangered karst invertebrates. Location of the mall to extreme sides of the trade area to avoid the karst zones would result in a significant increase in travel distance for shoppers from the extreme portions of the trade area. This would result in increased vehicle miles and air emissions. The chosen location of the proposed LakeLine Mall is based on existing infrastructure and the demographic center of an existing population base.

4.3

ALTERNATIVE 3 - ALTERNATE SITE LAYOUT

Endangered invertebrates may exist in any area of the eastern ¼ of the site. Insufficient acreage exists on the western ¼ of the site to develop the mall. The arrangement of parking area around the mall is necessary to afford equal access opportunity for patrons to all retail merchants. The mall plan was modified to allow for a 2.3 acre conservation area around LakeLine Cave which eliminated a portion of the parking lot.

The project has been developed around and in response to commitments from five major department stores. Initially, those department stores will occupy in excess of 700,000 square feet with expansion rights to over 760,000 square feet. From a market standpoint, a certain range of shops (other mall tenants) are required to support the retail development and demand created by the department store presence. A certain "critical mass" is required in order to make a retail development of this magnitude successful.

The size of the proposed development is necessary to recover the high development and predevelopment costs associated with this project. These costs continue to compound due to the extended delay in commencing construction. A smaller development would neither provide for a successful project nor materially lessen the probability of an impact to endangered species.

4.4

ALTERNATIVE 4 - WAIT ON THE REGIONAL 10(a) PERMIT

It should be reemphasized that planning and development of the mall has been ongoing for more than 5 years. Expenditures in effort and monetary resources have already been committed for which there is yet no return. Unplanned interest on development loans and retirement of municipal bonds for infrastructure development will continue to drain private as well as public funds otherwise available for other programs.

While the BCCP Executive Committee supports the need for a regional plan, there is, as yet, no definitive date for conclusion of the BCCP. This uncertainty is risky to the financial status of the mall project and the RUD. Significant delays could be financially detrimental to the project due to its advanced stage of planning and development.

The current proposal for an individual habitat conservation plan for LakeLine Mall provides conservation measures which meet the goals and objectives of the BCCP and further its progress. The stated purpose of the BCCP is to develop a strategy, acceptable to all parties concerned, to ensure the protection of certain endangered and threatened species in the Austin area, while allowing land development to proceed in an orderly manner under Section 10(a) of the Endangered Species Act. The individual plan will provide research in karst biology and invertebrate distribution which will aid planning of the BCCP. The individual plan also meets the objectives and requirements of the Act by providing conservation measures which will help ensure the continued existence of the species consistent with, but independent of the ultimate success of the BCCP.

Participation in the regional plan when it becomes effective would result in substantially the same impact on the site, but with a smaller contribution to the regional conservation effort than currently proposed.

4.5

ALTERNATIVE 5 - NO ACTION ALTERNATIVE

This scenario would result in potentially adverse impacts to local economies, would not result in the immediate alteration of the 116-acre LakeLine site or the incidental take of the Tooth Cave ground beetle or Bee

Creek Cave harvestman and would not result in funding of research programs on endangered cave invertebrates.

Significant improvements (roads and public utilities) have already been constructed in the area of the mall in anticipation of the revenue generation of the mall to help retire that debt. Without LakeLine Mall, the retirement of those debts would be placed on the general public or another entity that may develop all or a portion of the tract in the future. An impact could be felt in all areas of tax supported services, including schools, fire and police, road and street maintenance, water and wastewater utility service and maintenance, parks and recreation, and others.

Because the mall site is privately owned, there will continually be pressure to recapture land investment by various development means. The parcel is not capable of producing any other significant income, except for development, due to its relatively small size and urban surroundings. In all likelihood, a commensurate size and type of commercial development, or numerous small developments would occur over time. If the BCCP were completed and in place, these developments would move forward with only some impact fee imposed without definite knowledge of actual impacts.

Due to the site's previously disturbed condition and the amount of infrastructure development surrounding the site, it would not be a likely candidate for preserve acquisition for the BCCP or other set-aside area. The natural character, and thus, the preserve desirability of the site have been altered. The current developed cost per acre on the site significantly exceeds estimated purchase allowances by the BCCP.

Local taxing authorities will not gain the tax revenues generated by the mall and thus public services may be adversely affected. The absence of the tax revenues to local jurisdictions which would be generated by the mall would further jeopardize their financial ability to participate in the BCCP. Without local tax revenues to the RUD, it is likely to head into bankruptcy.

Growth in the area is anticipated to occur irrespective of construction of LakeLine mall. Off-site impacts such as the expansions of US 183 and SH 620 are also planned to occur with or without the mall. Should the LakeLine Mall project not be constructed, the potential impact to the karst fauna in the area would not be lessened due this additional growth planned for the area.

5.0 AGENCIES AND INDIVIDUALS CONSULTED

The following agencies, organizations, and people have been consulted or coordinated with during the process of addressing endangered species concerns for the LakeLine site.

U.S. Fish and Wildlife Service - Arlington, Texas
U.S. Fish and Wildlife Service - Albuquerque, New Mexico
U.S. Fish and Wildlife Service - Washington, D.C.
Office of Representative Chet Edwards, Washington, D.C.
Office of Representative Greg Loughlin, Washington, D.C.
Office of Representative J. Jake Pickle, Washington, D.C.
Office of Senator Richard Lugar, Washington, D.C.
Office of Senator Phil Gramm, Washington, D.C.
Texas Parks and Wildlife Department
Texas Parks and Wildlife Commission Chairman Chuck Nash
City of Austin, Texas
City of Austin, Mayor
Austin Chamber of Commerce
Travis County, Austin, Texas
Williamson County, Cedar Park, Texas
Cedar Park Chamber of Commerce, Board of Directors 1991

Leander ISD
City of Georgetown, Mayor
Buttercup Creek Joint Venture/F&J
Union National Bank
Cedar Park United Methodist
Chief, Cedar Park Police
City of Cedar Park, Mayor, Council members, and City Manager
Balcones Canyonlands Conservation Plan Executive Committee, Individual
Members, and Plan Consultants, Austin, Texas
Numerous citizens, public officials, and neighborhood groups of the
local area
Audubon Society, Austin, Texas
Sierra Club, Austin, Texas
Texas Nature Conservancy, San Antonio, Texas
Texas Cave Management Association, Austin, Texas
Texas System of Natural Laboratories, Inc., Austin, Texas
William G. Bunch, Attorney, Austin, Texas
Dr. Charles Woodruff, Geologist, Austin, Texas
James R. Reddell, Karst Invertebrate Biologist, Texas Memorial Museum,
Austin, Texas
Dr. William Elliott, PhD, Karst Ecologist, Austin, Texas
Dr. David Culver, Karst Ecologist, American University, Washington,
D.C.
Horizon Environmental Services, Inc., Austin, Texas
Oppenheimer, Wolff & Donnelly, Washington, D.C. and St. Paul, Minnesota

The Conservation Plan and portions of the Environmental Assessment were prepared by Horizon Environmental Services, Inc., Oppenheimer, Wolff & Donnelly, and the Applicant. All documents were prepared under contract to the Applicant.

Publication notification of the availability of the Draft Environmental Assessment will be published in the Federal Register. All concerned agencies and entities will be provided a copy for review and comment.

6.0

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