

4a



**Planning and Development Review Department
Staff Recommendations Concerning Required Findings
Water Quality Variances**

Project:	2009 Lake Shore Drive- SP-2013-0504DS
Ordinance Standard:	Land Development Code Section 25-8-281(C)(2)(b)
Variance Request:	To allow construction of a boat dock within a canyon rimrock Critical Environmental Feature buffer.

Justification:

A. Land Use Commission variance determinations from Chapter 25-8, Subchapter A – Water Quality of the City Code:

1. The requirement will deprive the applicant of a privilege or the safety of property given to owners of other similarly situated property with approximately contemporaneous development.

Yes. Properties with frontage along Lake Austin frequently contain boat docks and neighboring properties adjacent to the subject property have boat docks. There is an existing dilapidated dock and boardwalk that will be removed and replaced with another, new boat dock with a smaller footprint.

2. The variance:

- a) Is not based on a condition caused by the method chosen by the applicant to develop the property, unless the development method provides greater overall environmental protection than is achievable without the variance;

Yes. The construction of a boat dock, which is typical of a construction activity for shoreline properties along the lake, is occurring down gradient of the critical environmental feature at shoreline.

- b) Is the minimum change necessary to avoid the deprivation of a privilege given to other property owners and to allow a reasonable use of the property;

Yes. The applicant proposes to remove the existing non-conforming boat dock and replace it with a smaller footprint dock. While applicant is

requesting to exceed the allowable 20% of the shoreline frontage, that particular variance will be determined by the Board of Adjustments.

- c) Does not create a significant probability of harmful environmental consequences; and

Yes. The construction of the boat dock does not create a significant probability of harmful environmental consequences, because the construction activities required to construct the boat dock will not cause significant discharge of sediment into lake and the proposed construction activities do not coincide with critical environmental feature.

3. Development with the variance will result in water quality that is at least equal to the water quality achievable without the variance.

Yes. The construction of the boat dock will result in at least equal or greater water quality, because the proposed construction activity is occurring down gradient of the rimrock critical environmental feature. As a result, there will be no increase sediment-laden runoff over the rimrock. In addition, the applicant is reducing the size of the current boat dock, which in turn, decreases the impact of shading from existing dock on aquatic plant growth along the shoreline.

Environmental Reviewer:


Liz Johnston

ERM Hydrogeologist Reviewer:


Scott Hiers

Environmental Officer:


Chuck Lesniak

Date: Sept. 10, 2014

Staff may recommend approval of a variance after answering all applicable determinations in the affirmative (YES).



ITEM FOR ENVIRONMENTAL BOARD AGENDA

**BOARD MEETING
DATE REQUESTED:**

SEPTEMBER 17, 2014

**NAME & NUMBER
OF PROJECT:**

2009 LAKESHORE DRIVE BLDG BD
SP-2013-0504DS

**NAME OF APPLICANT
OR ORGANIZATION:**

Aupperle Company
Bruce Aupperle, (512) 422-7838

LOCATION:

2009 Lakeshore Dr.

PROJECT FILING DATE:

December 31, 2013

**WPD/ERM
STAFF:**

Scott Hiers, 974-1916
scott.hiers@austintexas.gov

**PDRD/ENVIRONMENTAL
STAFF:**

Liz Johnston, 974-1218
liz.johnston@austintexas.gov

**PDRD/
CASE MANAGER:**

Michael Simmons-Smith, 974-1225
michael.simmons-smith@austintexas.gov

WATERSHED:

Lake Austin (Water Supply Rural),
Drinking Water Protection Zone

ORDINANCE:

Watershed Protection Ordinance (current Code)

REQUEST:

1) Variance request is as follows: To allow construction of a boat dock within a canyon rimrock Critical Environmental Feature buffer, 25-8-281(C)(2)(b).

STAFF RECOMMENDATION: Recommended.

REASONS FOR RECOMMENDATION: The findings of fact have been met.



MEMORANDUM

TO: Mary Gay Maxwell, Chairperson and Members of the Environmental Board

FROM: Liz Johnston, Environmental Review Specialist Senior
Planning & Development Review Department

DATE: September 9, 2014

SUBJECT: 2009 Lakeshore Dr. SP-2013-0504DS

On your September 17, 2014 agenda is a request for consideration and recommended approval of a variance to allow development (construction of a boat dock) within a rimrock Critical Environmental Feature buffer.

Description of Property

The subject property is a 0.775-acre parcel that was granted a land status determination in 2002 and is therefore a legal tract. The subject property is located in the Lake Austin Watershed, is classified as Water Supply Rural, and is located in the Drinking Water Protection Zone. According to City of Austin GIS, the site is located over the North Edwards Aquifer Recharge Zone. The Lake Shore Addition subdivision dates from 1915. The property is located within the Full Purpose Planning Jurisdiction along the shoreline and the remainder of the property lies within the Limited Purpose Planning Jurisdiction. The entire property is zoned LA. According to Travis County Appraisal District records, there are two existing residences, one constructed in 1960 and another constructed in 1980. The site does have an existing dock and stairs for shoreline access. The shoreline access is in relative disrepair, but the applicant does have the ability to walk down the Island Way right of way to access the shoreline rather than walk down the existing stairs.

Existing Topography/Soil Characteristics/Vegetation

According to City of Austin GIS, the lot elevation ranges from the Lake Austin shoreline at 492.8 feet mean sea level (msl), to approximately 586 feet msl at the street. According to the Environmental Resource Inventory dated June 2, 2014, the soils (Tarrant soils and urban land) are stony with underlying Edwards Plateau soils (erosion-resistant limestone and limestone inter-bedded with clay and marl). Vegetation consists of an oak/juniper woodland with plateau live oak, ashe juniper, cedar elm, chinaberry, Chinese tallow, hackberry, and Texas persimmon. Understory species include flame-leaf sumac, redbud, mountain laurel, Texas buckeye, agarita, yaupon, croton, and buffalograss.

Critical Environmental Features/Endangered Species/CWOZ

One large canyon rimrock Critical Environmental Feature (CEF) located downstream of the house (see attached exhibits) that ranges in height from 12' to 20' high and wraps around the eastern edge of the property, crossing onto the adjacent property. Single family residential projects along Lake Austin

contain a 75' Critical Water Quality Zone (CWQZ) offset from the 492.8' contour elevation and the entire limits of construction is located within the CWQZ. According to the ERI, the project does lie within a confirmed golden-cheek warbler habitat with potentially suitable habitat for terrestrial karst invertebrates. The applicant has notified the appropriate authorities about the proposed development within an endangered species habitat.

Project Background

The site plan under review was submitted on December 31, 2013 and proposes the demolition of two non-conforming structures, a boardwalk surrounding a lagoon and an dilapidated boat dock that lies partially within the neighboring property to the south. The proposed location for the new dock will place it more centrally along the lakeshore frontage, outside of the 10' side yard setbacks. While the dock does exceed 20% of the shoreline width, the dock is proposed to be 14 feet in width. The proposed 14' width would meet the allowable requirements for a minimum-size dock under the most recent code changes. Because the project was submitted prior to the adoption of the most recent ordinance regarding boat dock regulations and is therefore being reviewed under the older boat dock code, the applicant will need a Board of Adjustment variance to exceed 20% of the shoreline width, according to the case manager. The project does reduce overall non-compliance with the code due to the demolition of the non-conforming boardwalk and boat dock.

Environmental Code Variance Request

According to LDC 25-8-281(C)(1)(a), a Critical Environmental Feature setback of 150' is required from the edge of the canyon rimrock CEF. LDC 25-8-281(C)(2)(b) prohibits construction within the CEF buffer. The requested variance is to keep the 150' buffer, but allow the proposed construction of a new dock within the buffer. While other previous variances have been requested to reduce the buffer, granting a variance to simply allow the proposed construction of the dock, along with the removal of existing structures, within an intact buffer will provide greater overall environmental protection.

Related Cases

A similar rimrock CEF environmental variance was recommended for approval by the Environmental Board and approved by Planning Commission at 3213 Smoky Ridge (SP-2013-0398DS).

Environmental Conditions

- No environmental conditions are suggested.

Recommendation

Staff recommends approval of both variances because the Findings of Fact (enclosed herein) have been met.

2009 LAKESHORE DRIVE SP-2013-0504DS

Scott Hiers, P.G., Hydrogeologist

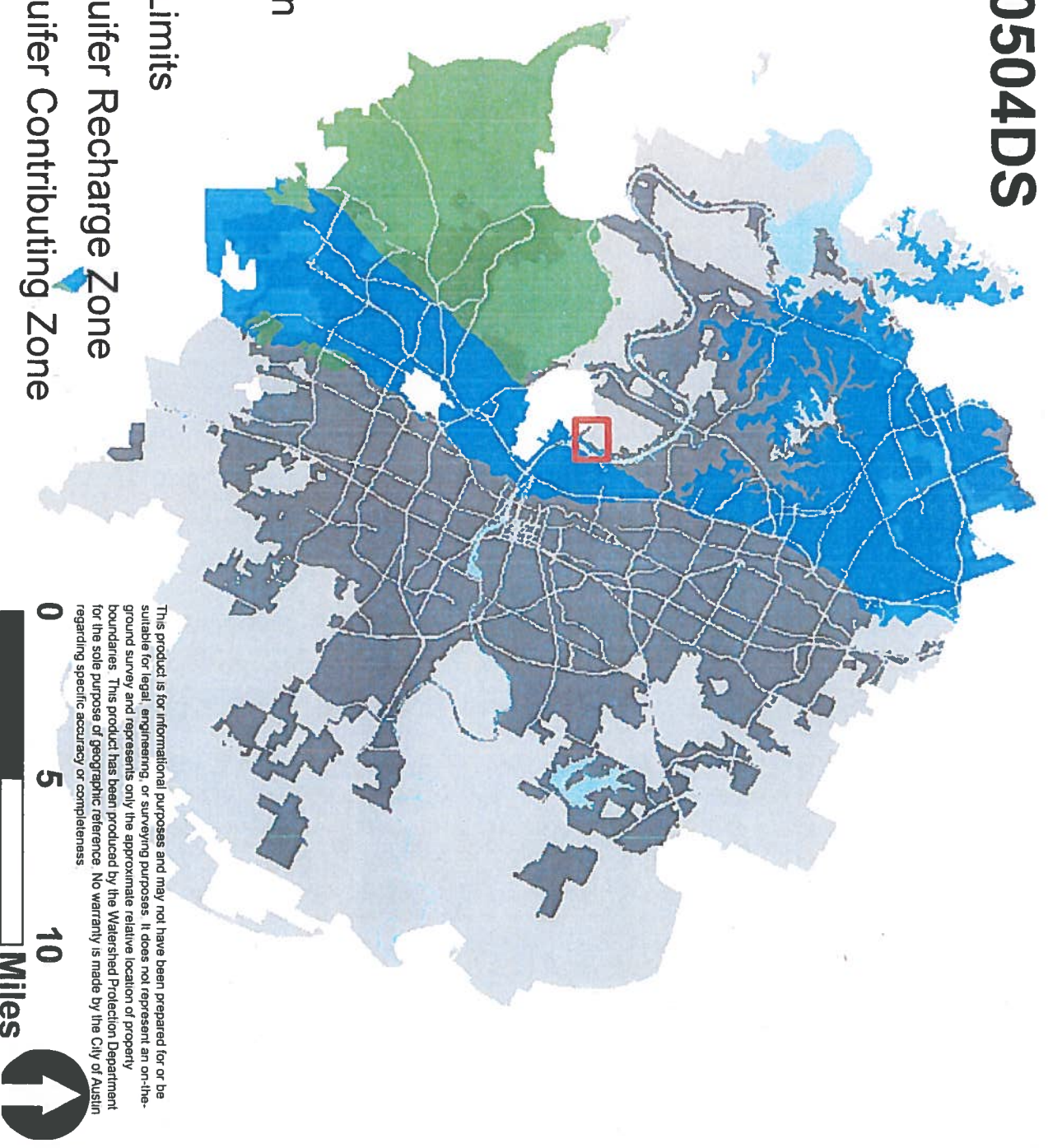
Environmental Resource Management, WPD

Liz Johnston. Environmental Review Specialist Senior

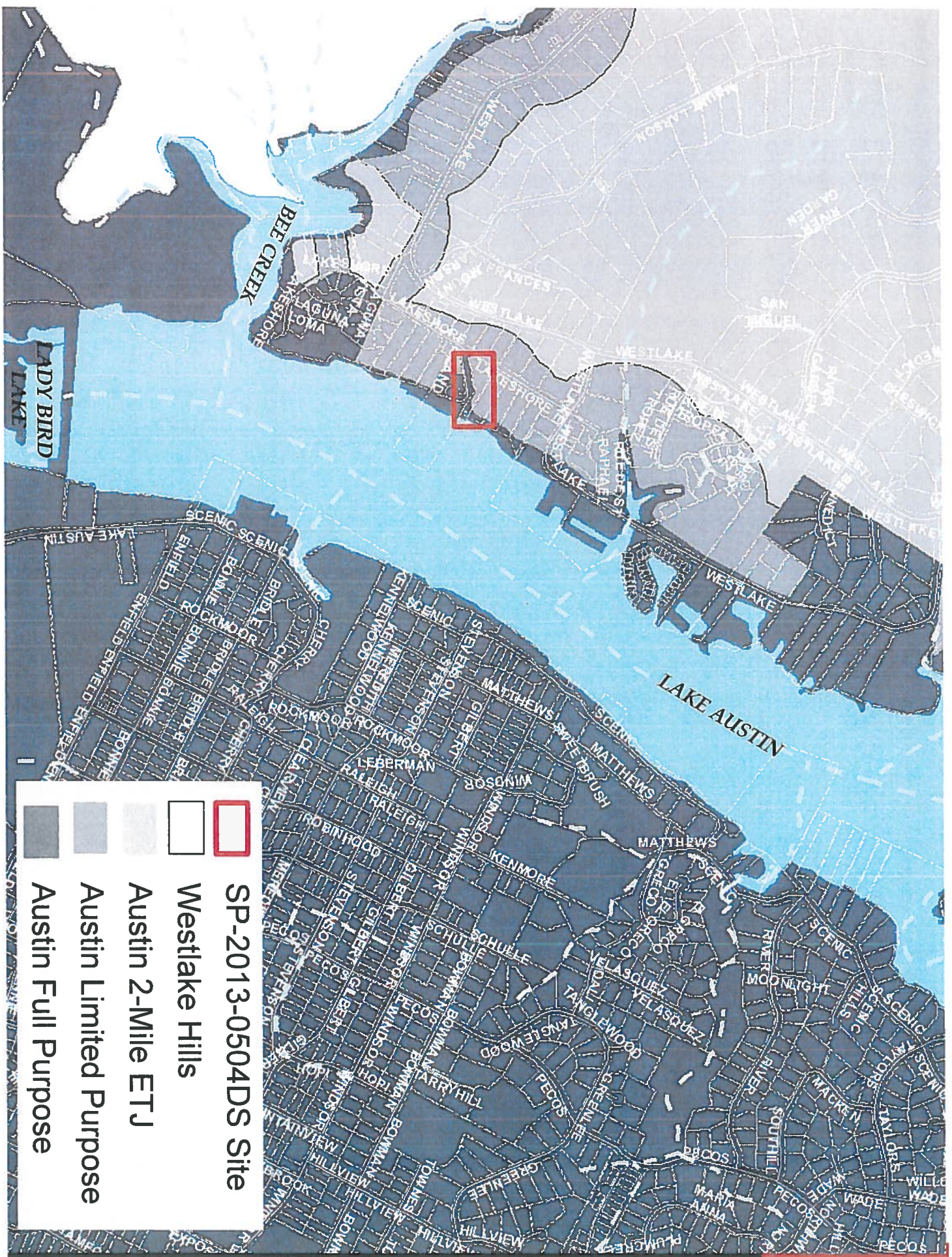
Land Use Review, PDRD

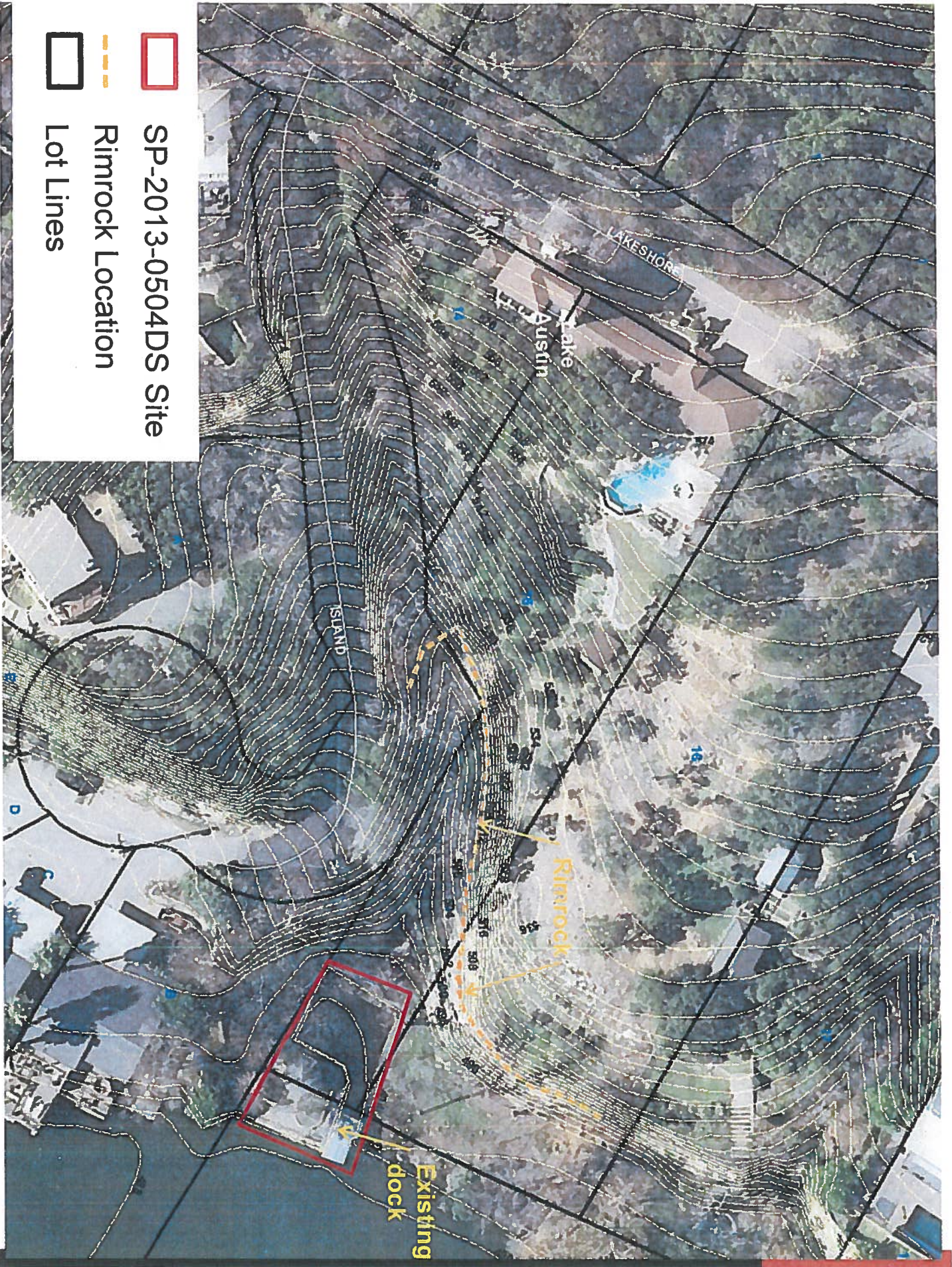
SP-2013-0504DS

-  Site Location
-  Austin ETJ
-  Austin City Limits
-  Edwards Aquifer Recharge Zone
-  Edwards Aquifer Contributing Zone



This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. This product has been produced by the Watershed Protection Department for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness.







Rimrock and existing access



Rimrock



Rimrock and existing access



Existing shoreline improvements. Dock and boardwalk to be removed, gazebo to remain.





View downriver from proposed dock location.



View upriver from proposed dock location.



View west from peninsula towards Island Way.

PROPERTY DATA

- Lake Austin Watershed
- Water Supply Rural
- Drinking Water Protection Zone
- Full Purpose/Limited Purpose Jurisdiction
- Edwards Aquifer Recharge Zone
- Rimrock Critical Environmental Features

BACKGROUND

- Existing single family residence.
- Shoreline consists of existing bulkhead (stone and wood), existing dock, existing gazebo and existing boardwalk surrounding a lagoon.
- Applicant proposes only to demolish existing dock and boardwalk and build a new 14' wide dock in a different location.
- Resulting development reduces overall footprint of disturbance within the CEF buffer.

LDC 25-8-281(C)(2)(B)

This subsection prescribes what is allowed to occur within a Critical Environmental Feature Buffer.

2) Within a buffer zone described in this subsection:

- (a) the natural vegetative cover must be retained to the maximum extent practicable;
 - (b) construction is prohibited; and
 - (c) wastewater disposal or irrigation is prohibited.
- **Variance request is to allow construction of the new dock within the CEF buffer.**

VARIANCE RECOMMENDATION

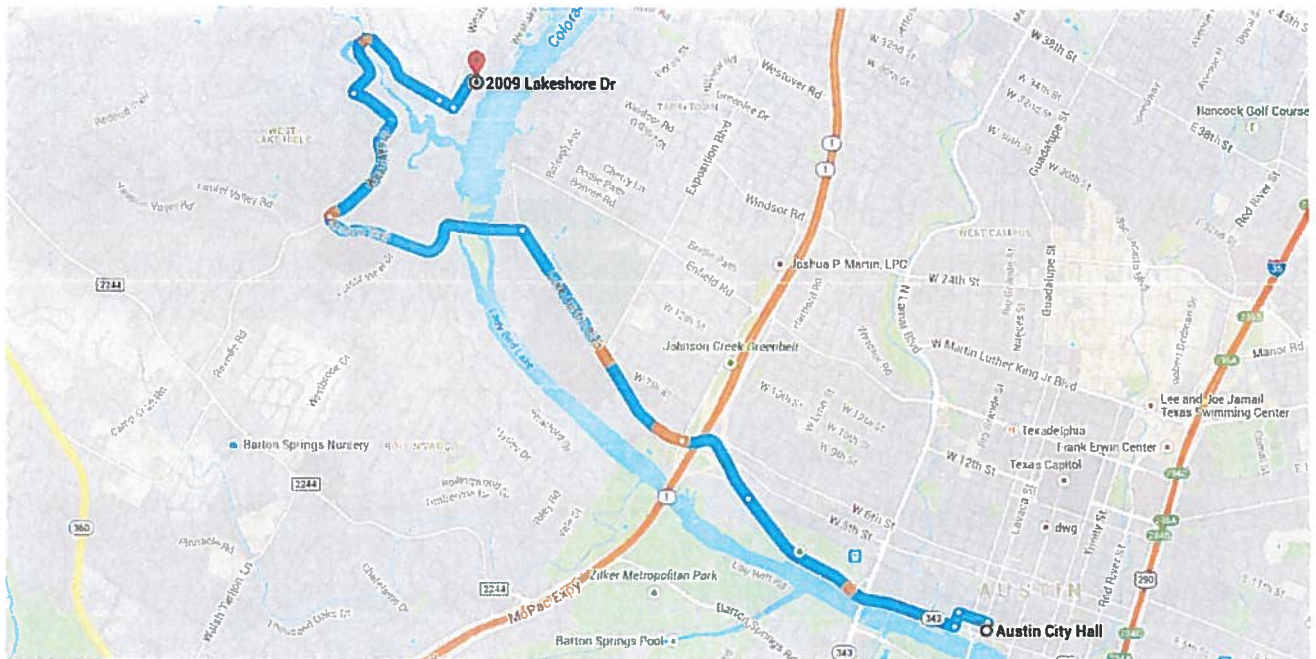
Approval of variance:

- *Staff believes the Findings of Fact have been met.*
- *No conditions have been requested by staff.*



Drive 6.0 miles, 14 min

Directions from Austin City Hall to 2009 Lakeshore Dr



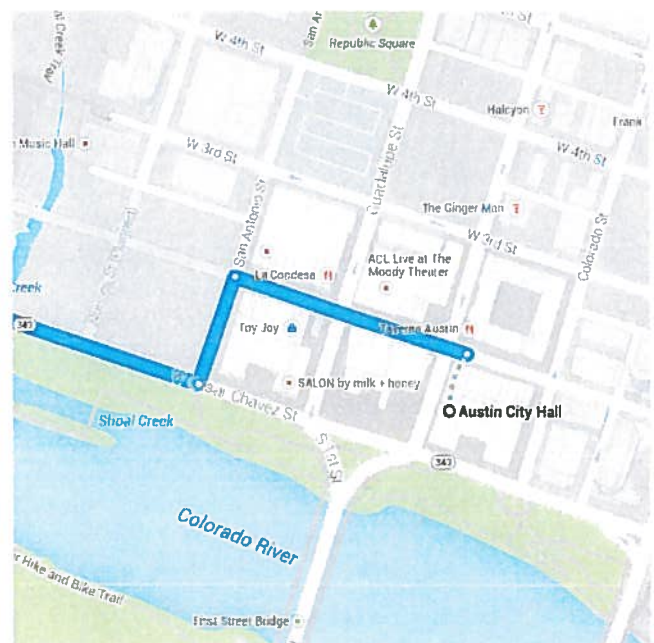
○ Austin City Hall

301 W 2nd St, Austin, TX 78701

Take W 2nd St to W Cesar Chavez St

0.2 mi / 2 min

- ↑ 1. Head west on W 2nd St toward Lavaca St
0.1 mi
- ↶ 2. Turn left onto San Antonio St
358 ft

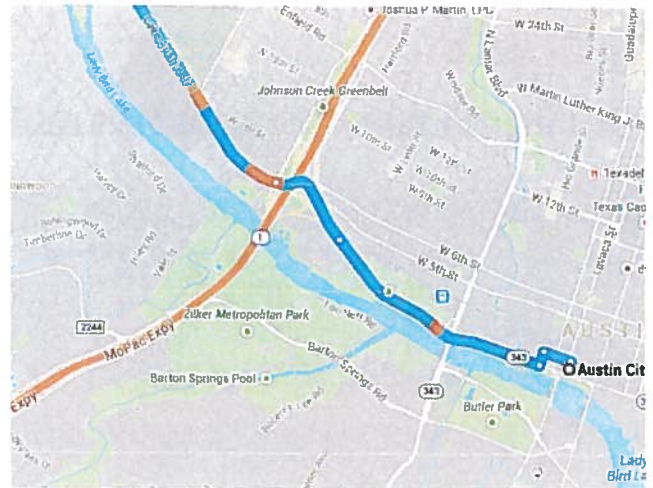


Continue on W Cesar Chavez St. Take Lake Austin Blvd to Redbud Trail

2.9 mi / 5 min



- 3. Turn **right** onto **W Cesar Chavez St** 1.2 mi
- 4. Keep **left** at the fork, follow signs for **Lake Austin Blvd** and merge onto **W 6th St** 0.5 mi
- 5. Continue onto **Lake Austin Blvd** 1.3 mi



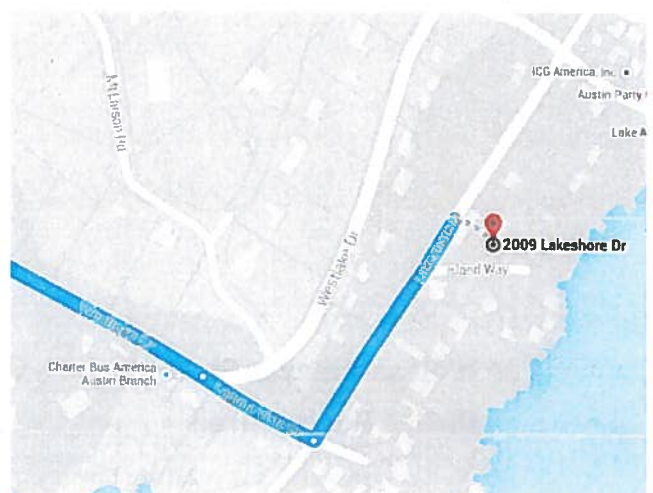
- Turn **left** onto **Redbud Trail** 1.0 mi / 2 min
- Follow **Westlake Dr** to **Laguna Vista Dr** 1.6 mi / 4 min

- 7. Turn **right** onto **Westlake Dr** 0.8 mi
- 8. Turn **right** to stay on **Westlake Dr** 0.8 mi



- Drive to **Lakeshore Dr** in Austin 0.2 mi / 48 s

- 9. Continue onto **Laguna Vista Dr** 407 ft
- 10. Turn **left** onto **Lakeshore Dr** 0.2 mi





ENVIRONMENTAL BOARD VARIANCE APPLICATION TEMPLATE

Insert Applicant Variance Request Letter here.

PROJECT DESCRIPTION

Applicant Contact Information

Name of Applicant	VALLA DJAFARI
Street Address	2009 LAKE SHORE DR.
City State ZIP Code	AUSTIN TX 78746
Work Phone	512-568-4511
E-Mail Address	VDJAFARI@HOTMAIL.COM

Variance Case Information

Case Name	2009 LAKE SHORE DRIVE		
Case Number	SP-2013-0504DS		
Address or Location	2009 LAKE SHORE DR., AUSTIN, TX 78746		
Environmental Reviewer Name	JOHNSTON & HIRS		
Applicable Ordinance	25-8-42, 25-8-281(c)(2)(6)		
Watershed Name	LAKE AUSTIN		
Watershed Classification	<input type="checkbox"/> Urban <input type="checkbox"/> Suburban <input type="checkbox"/> Water Supply Suburban <input checked="" type="checkbox"/> Water Supply Rural <input type="checkbox"/> Barton Springs Zone		
Edwards Aquifer Recharge Zone	<input type="checkbox"/> Barton Springs Segment <input type="checkbox"/> Northern Edwards Segment <input checked="" type="checkbox"/> Not in Edwards Aquifer Zones		

September 9, 2014

Edwards Aquifer Contributing Zone	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Distance to Nearest Classified Waterway	0
Water and Waste Water service to be provided by	NONE PROPOSED OR REQUIRED
Request	The variance request is as follows (Cite code references:

Impervious cover	Existing	Proposed
square footage:	0	0
acreage:	0	0
percentage:	0	0
Provide general description of the property (slope range, elevation range, summary of vegetation / trees, summary of the geology, CWQZ, WQTZ, CEFs, floodplain, heritage trees, any other notable or outstanding characteristics of the property)	SEE ENGINEER'S SUMMARY LETTER ATTACHED.	

Clearly indicate in what way the proposed project does not comply with current Code (include maps and exhibits)	CONSTRUCTION WITHIN 150' OF RIM ROCK CEF.
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Watershed Variances - Findings of Fact

As required in LDC Section 25-8-41, in order to grant a variance the Land Use Commission must make the following findings of fact: Include an explanation with each applicable finding of fact.

Project: 2009 Lake Shore Drive, SP-2013-0504DS

Ordinance Standard: 25-8-42, 25-8-281(C)(2)(b)

JUSTIFICATION:

(1) the requirement will deprive the applicant of a privilege or the safety of property given to owners of other similarly situated property with approximately contemporaneous development; This application proposes to demolish an existing dilapidated dock and construct a new 14' dock at the shoreline. There are several adjacent docks all located within the 150-foot rim rock CEF buffer. These docks were grandfathered or were granted this variance administratively. This code requirement does not allow for the existing dock to be demolished or maintained since the whole shoreline (and lot) is located within the 150-foot CEF buffer. By code, the new dock cannot be built unless the existing dock is demolished. The new dock cannot be built adjacent to the shoreline since the 150-foot setback limit reaches about 40 feet into the lake.

(2) the variance:

(a) is not based on a condition caused by the method chosen by the applicant to develop the property, unless the development method provides greater overall environmental protection than is achievable without the variance; Construction of the dock is limited by 10' side yard setbacks in LA zoning. Since the lot width is 50', the location of the dock is limited to the center portion of the lot's shoreline, which is all within the CEF buffer. The variance is not needed because of a condition caused by the method of development.

(b) is the minimum change necessary to avoid the deprivation of a privilege given to other property owners and to allow a reasonable use of the property; This lakefront lot would not have the ability to have a safe dock, similar to other lakefront property owners, without the variance.

and

(c) does not create a significant probability of harmful environmental consequences; This application proposes to construct a boat dock down gradient of the rim rock at the shoreline. The construction methodology has a minimal footprint of 14' by 30' and will not impact the rim rock area. The variance does not create a significant probability of harmful environmental consequences.

(3) development with the variance will result in water quality that is at least equal to the water quality achievable without the variance. This application is for a new dock down gradient of the on-site rim rock. Should the dock be located outside of the standard CEF buffer, the resulting water quality would be the same, however the dock would not be adjacent to the shoreline, require a variance to exceed 30' into the lake and essentially would be unusable.



Aupperle Company

10088 Circleview Drive, Austin, Texas 78733

Phone & Fax (512) 329-8241

Email: Aupperle@att.net

Texas Board of Professional Engineers Registration Number F-1994

September 8, 2014

Director of Planning and Development Review
City of Austin
P.O. Box 1088
Austin, Texas 78767

Re: Environmental Assessment Report, Engineer's Floodway Encroachment Certification and Summary Letter for Demolition of an Existing Single-Family Boat Dock and Construction of a New Single-Family Dock on Lake Austin at 2009 Lake Shore Drive, Austin Texas

Dear Director:

This project proposes to construct a new boat dock and appurtenances. A general description of the proposed project follows.

Overview

This project is located at is situated near the intersection of Westlake Drive and Westlake Pass. The property is located within the city limits of the City of Austin. The principal residence associated with this residential dock will be at 2009 Lake Shore Drive. The project site is located within the Lake Austin watershed. The existing dock is to be demolished. The new dock width will be 28% of the shoreline width. All access for construction activities will be by water. All piles will be 6-5/8" driven steel piles. All piles will be driven to 0.5" refusal per blow. Access to the dock will be by foot across the lawn and an existing foot path. There is an existing shoreline walk/bulkhead. There are no shoreline improvements proposed. The dock improvements will be built this coming fall.

Environmental Assessment

The project site is not located over a karst aquifer, is not within an area draining to a karst aquifer or reservoir, is not within a water quality transition zone, is within a critical water quality zone, is not located on slopes with a gradient more than 15 percent, but is however located within the 100-year flood plain of Lake Austin and within 150' of a rim rock CEF. The F.E.M.A. flood plain information is attached and F.I.R.M information is included on the Cover Sheet.

Hydrogeologic Element: The topographic slope under the dock is a grade less than 15 percent. The site is located in Lake Austin and the soils according to the Geologic Atlas of Texas are predominantly *alluvium (Qal)* and *fluviatile terrace deposits (Qt)*, i.e. sedimentary soils with some boulders. The project is within a CEF buffer for rim rock, however there are no other known springs, bluffs, caves, sinkholes, point recharge features, karst or other critical environmental features within 150 feet of the boat dock. The project is 100% over Lake Austin and runoff from the dock should not propose any harm to the quality or quantity of recharge at significant point recharge features, since there are none.

Vegetation Element: The proposed construction preserves to the greatest extent practicable the significant trees and other vegetation at the single-family site. One Chinese Tallow tree will be

September 8, 2014.
Director of Planning and Development Review

Page 2 of 2

removed for the dock construction. The site contains some wetland plants, however, they do not constitute a critical environmental feature.

Wastewater Element: No wastewater or water service is proposed for this project. Therefore, justifications, explanations, descriptions, techniques, standards or calculations regarding wastewater service are not included herein.

Engineer's Certification - Floodway Encroachment - LDC 25 -12 G103.5

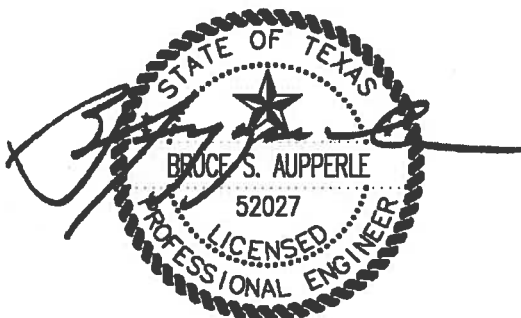
The proposed improvements will not increase the rate of storm runoff within the Colorado River watershed. The openness and profile of the proposed dock will not adversely obstructive flood flows relative to the existing dock, shoreline protrusions and adjacent improvements and will not increase the level of the design flood of the adjacent Colorado River.

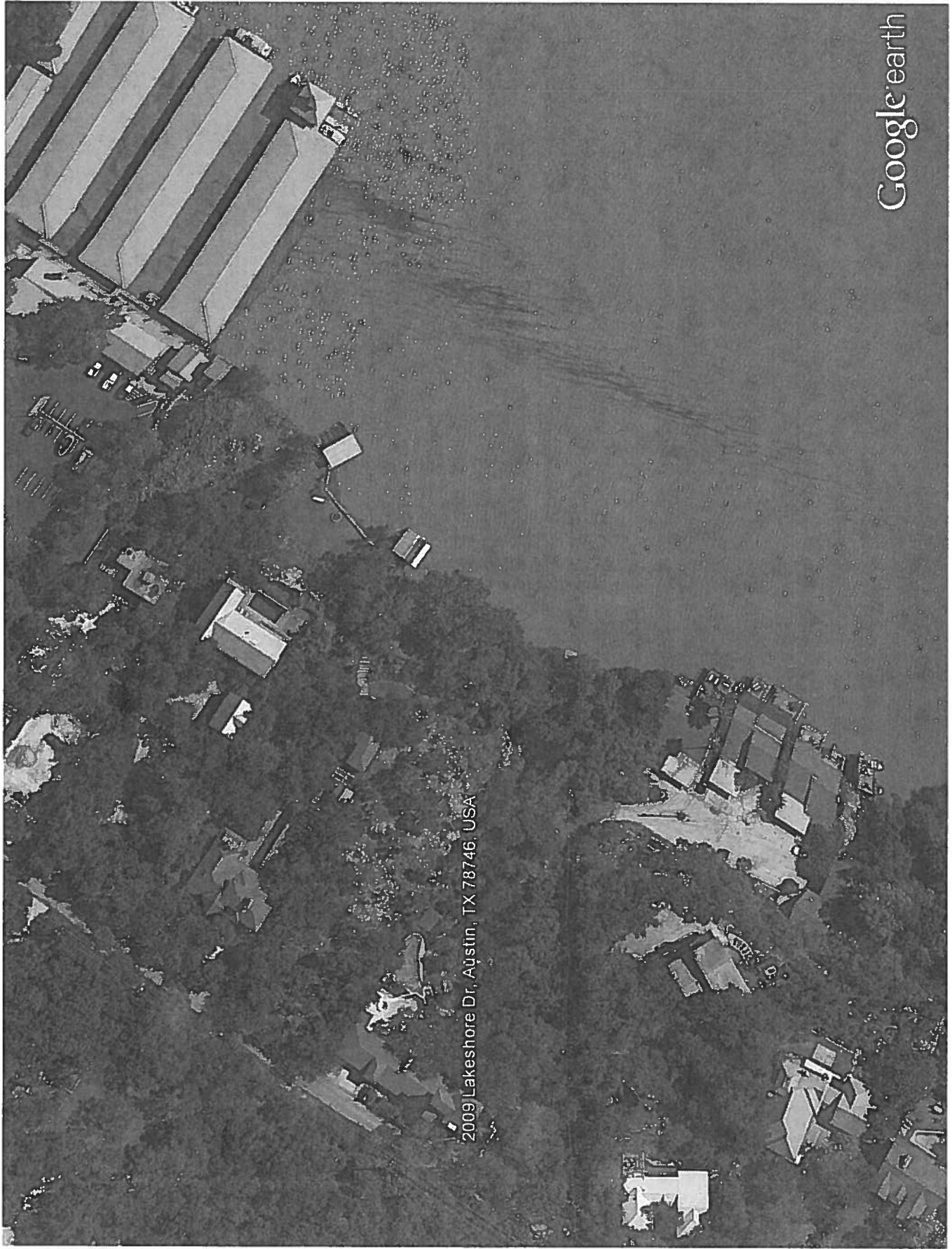
Variances, Waivers & Conclusions

The dock construction is located with the critical water quality zone, but a variance to construct the dock facilities in the CWQZ is not required. The dock width does exceeds 20% of the shoreline width, 14' wide on 50' of lake frontage. The dock will not extend beyond the 30' shoreline. The dock will not encroach into the 10-foot side yard setback. Construction of the proposed dock and demolition of the existing dock will take place 30 feet down-gradient of the rim rock, but within the 150-foot CEF buffer, which requires a variance. The project as designed is in substantial compliance with the applicable requirements of the City of Austin Development Code. There will be no adverse impact on the natural and traditional character of the land or waterways. If you have any questions, please feel free to call.

Very truly yours,

Bruce S. Aupperle, P.E.





2009 Lakeshore Dr, Austin, TX 78746, USA

Google Earth



Legend

Lot Lines

Streets

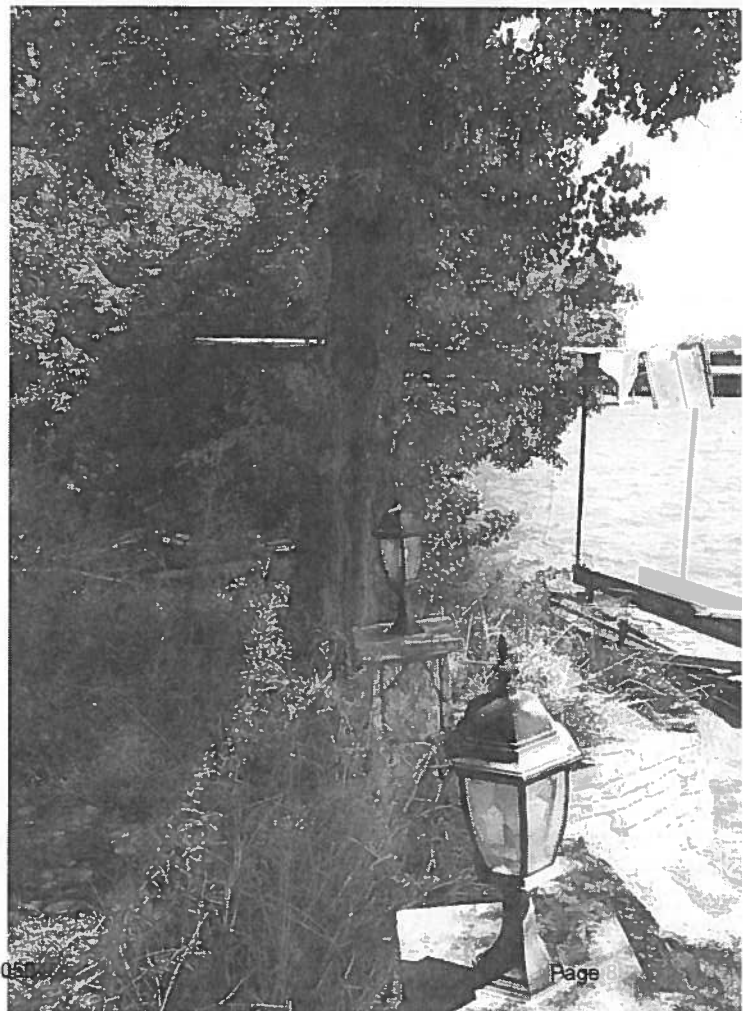
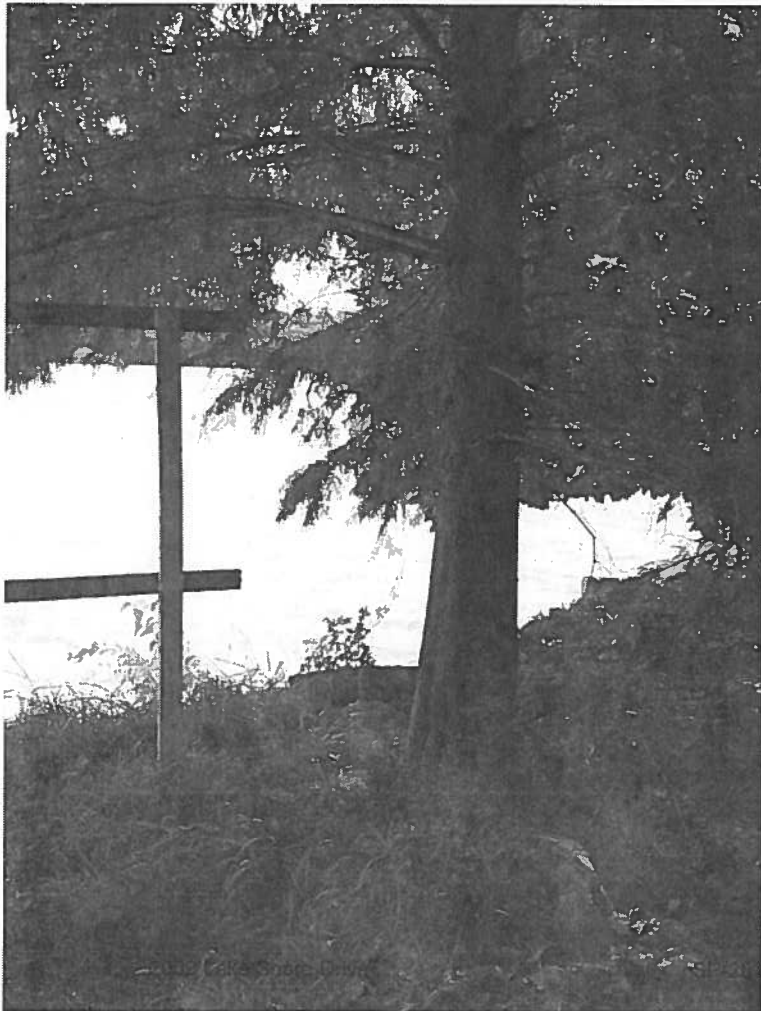
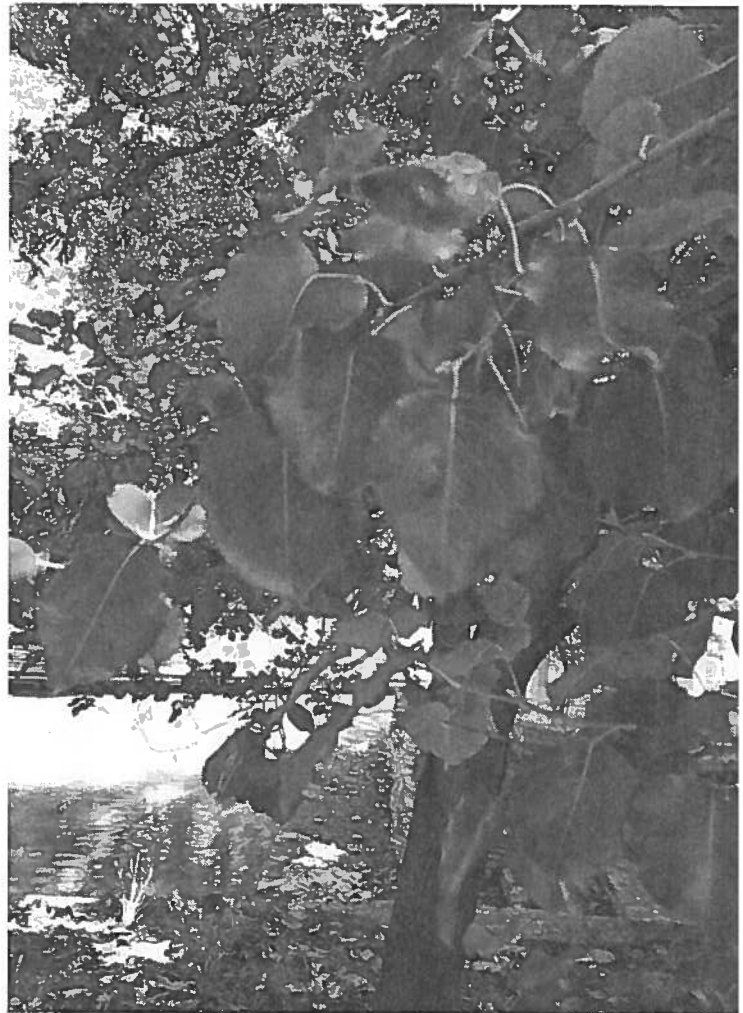
Building Footprints

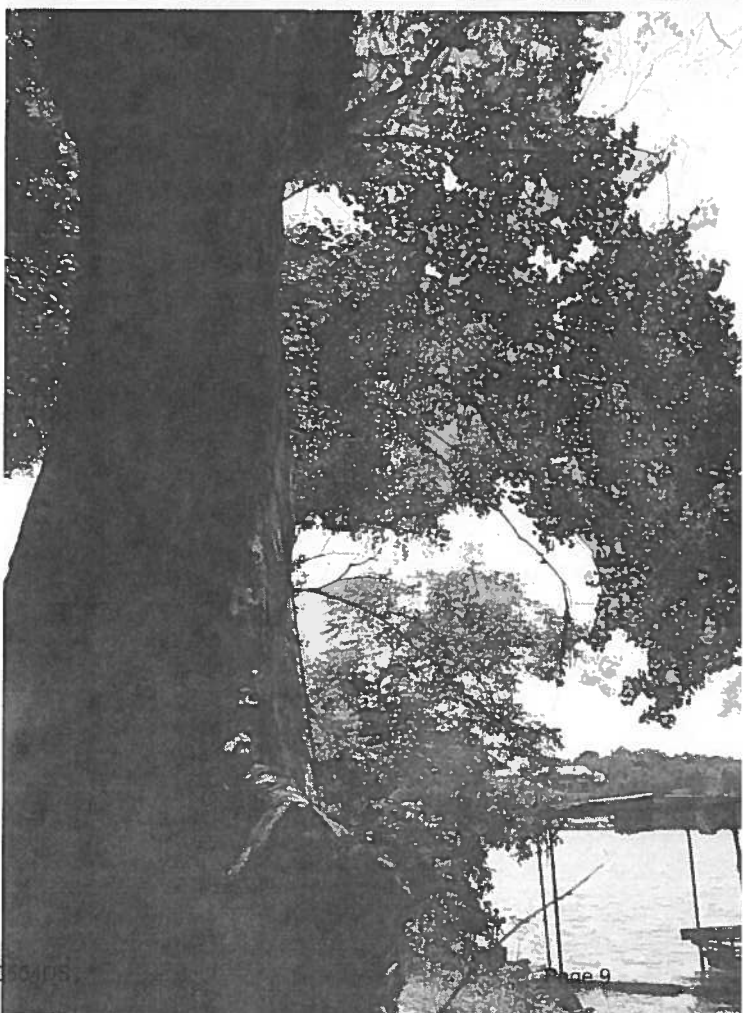
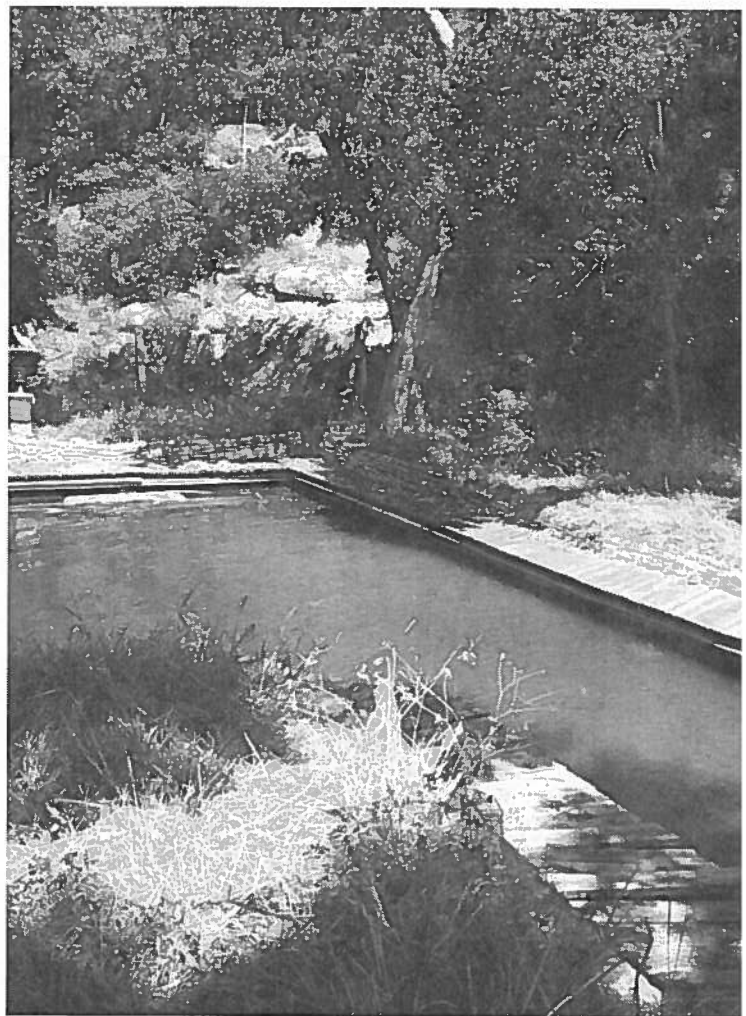
Named Creeks

Lakes and Rivers

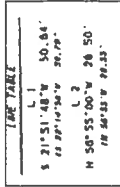
Parks

County





All responsibility for the adequacy of these plans remain with the engineer who prepared them. In approving these plans, the City of Austin must rely upon the adequacy of the work of the design engineer.



Existing Conditions

FEMA & COA Fully Developed
100-Year Flood Plain
Approx. Elev. 492.9'

Ex. Lake Austin Shoreline @ El. 492.8'

2009 Lake Shore Drive
EXISTING CONDITIONS &
DEMOLITION PLAN

AUPPERLE COMPANY
Engineering, Planning & Development Service
10000 Cletcher Drive, Austin, Texas 78733 512 329-8241
Texas Board of Professional Engineers Registered Professional P-1093

1429-1241

13 512 1

7471 25th Ave

min, Te

my '24

New Dr.

6. The following are the names of the people who were involved in the project:

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[illegible]

1

1

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17.

NP

DOI.

1170

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DEN

1

1

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2 d4

5/6/2015

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POLYMER LETTERS

1000

2009 Lake Shore Drive

All responsibility for the adequacy of these plans rests with the engineer who prepared them. In approving these plans, the City of Austin does not warrant the accuracy of the data or the design.

Existing Shoreline Length = 50.64'
 Proposed Dock Width = 30% of 50.64' = 15.19'
 Proposed Dock Length = 30' x 27.45% = 8.24'
 Proposed Dock Depth = 30'

Source of Topography: City of Austin GIS

DATE	BY	CHKD
10/11/11	AM	AM
10/11/11	AM	AM
10/11/11	AM	AM
10/11/11	AM	AM

TIME TABLE	
L 1	\$ 21'51" 48" W 30.64
L 2	\$ 27'14" 36" W 39.79
L 3	\$ 58'55" 00" W 36.50
L 4	\$ 30'23" W 34.35

30' x 14' 1-Slip Dock

Rimrock CEF

John Horton III Etals
 2011 Lake Shore Drive
 Lot 16 Lake Shore Addn.
 Deed Doc. # 2011165282
 Zoning: LA
 Use: Vacant SF Residential Lot

75' LA Setback & CWQZ

\$ 56'55" 00" W 293.32

Valle Ojeda
 2009 Lake Shore Drive
 Lot 14 & 15 Lake Shore Addn.
 Deed Doc. # 2012 201150
 Zoning: LA
 Use: SF Residence

Ex. Shoreline Access

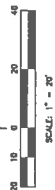
Phyllis Ladin
 3001 Island Way
 Lot 101 Island Way
 Deed Doc. # 2007210124
 Zoning: SF-3
 Use: SF Residence

ISLAND WAY

Ex. Gazebo & Flat Work
 to Remain

Ex. Lake Austin Shoreline @ El. 492.8'

FEMA & COA Fully Developed
 100-Year Flood Plain
 Approx. Elev. 492.9'



Lake Austin

2009 Lake Shore Drive
 SITE PLAN

AUPPERLE COMPANY
 Engineering, Planning & Development Services
 10000 Crestview Drive, Austin, Texas 78731 512.229.4241



DATE: 10/11/11	BY: AM	CHKD: AM
SCALE: 1" = 20'		
PROJECT: 2009 Lake Shore Drive		
SHEET: 4 of 4		

SP-2013-0094940

ESCARPMENT ENVIRONMENTAL

Geologic & Environmental Consulting for Land Development

2 June 2014

**Environmental Assessment and
Endangered Species Habitat Assessment
Compliance Report per the City of Austin Land Development Code (Section 25-8-121)
and (Environmental Criteria Manual - ECM 1.3.0)**

**1.572025-acre property
Lakeshore Addition
Lots 15 & 16, part of Lot 14
2009 Island Way
Austin, Travis County, Texas**

Escarpment Job #E0140014-EAHA

1.0 PURPOSE

The purpose of this report is to provide an environmental assessment for Critical Environmental Features (CEFs) and endangered species habitat assessment as required by the City of Austin Land Development Code (Section 25-8-121) and Environmental Criteria Manual (ECM 1.3.0).

Escarpment conducted the field reconnaissance on 21 April 2014. Escarpment spent a minimum of 4 person hours on-site in the field evaluating the site and surrounding area, and completed the assessment process by conducting a review of the existing literature. This assessment includes a review for any potential threatened or endangered species described in Section 3.0 of this report.

All figures are provided in Attachment 1. A critical environmental feature (CEF) evaluation form is provided in Attachment 2. Site photographs are provided in Attachment 3.

Escarpment Environmental conducted a thorough karst survey for potential karst features that could provide habitat for terrestrial karst invertebrates, according to United States Fish and Wildlife Service (USFWS) protocol. This study also includes a review of the site for potential aquifer recharge and documentation of general geologic characteristics for the subject site. Escarpment Environmental also conducted the necessary field and literature studies according to TCEQ Instructions to Geologists for completing Geologic Assessments within the Edwards Aquifer Recharge Zone (TCEQ, 2004). Escarpment Environmental walked transects spaced 50 feet apart to search for any potential karst features. Escarpment Environmental removed loose rocks and soil (by hand) to preliminarily assess each feature's subsurface extent. However, labor-intensive excavation was not conducted.

**700 LAVACA, SUITE 1400 • AUSTIN, TEXAS • 78701
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WWW.ESCARPMENTENV.COM**

Escarpment recommends that the developer arrange for a professional land surveyor to locate accurately any sensitive features in relation to the design plan. GPS coordinates in the tables provided in Attachment 2 are provided in WGS84/decimal degrees datum. A WAAS-enabled Garmin GPS 76CS unit was used to collect approximate feature locations within estimated accuracy of about 10 meters, depending on tree canopy coverage. These coordinates provide an estimate of location each feature. However, if the proposed development is in close proximity to a sensitive feature,

2.0 Site Description

The property (1.572025-acre property, Lakeshore Addition, 2009 Island Way, Austin, Travis County, Texas) is located in western Travis County on the shores of Lake Austin (Figure 1). The property consist of two tracts of land describe in the Travis County Appraisal District records as 0.73959-acre property (Lot 15 & part of Lot 14) and 0.832435-acre property (Lot 16), Lakeshore Addition.

A site location map is provided as Figure 1. A site boundary and topographic map is provided on Figure 2. Soils and a 2002 or 2006 aerial photograph are provided on Figure 3. Site geology is shown on Figure 4. A site feature map is provide on Figure 5, A copy of the Balcones Canyonland Conservation Plan Map is provided on Figure 6. The Karst Faunal Zone Map is provided on Figure 7. Site photographs are provided in Attachment 3.

Following is a description of environmental setting characteristics.

2.1 Land Use

The property consists of approximately 1.572025-acre property developed as a single-family home with local utilities and a boat dock. Surrounding land use is single-family residential homes.

2.2 Vegetation

Vegetation on the subject site is typical of the Edwards Plateau and characterized as oak/juniper woodlands. The natural regions of Texas were delineated largely based on soil type and major vegetation types. The subject site is situated within the Cross Timbers vegetation region of Texas (Thomas & Gould, 1975) and Live Oak-Ashe Juniper Woods region (McMahan et al. 1984).

The subject site consists of a single-family home with a wooded yard and landscaping plants. Canopy species consist of mainly plateau live oak (*Quercus fusiformis*) with scattered Ashe juniper (*Juniperus ashei*), cedar elm (*Ulmus crassifolia*), Texas oak (*Quercus buckleyi*),

sugarberry (*Celtis laevigata*), and Texas persimmon (*Diospyros texana*). Common understory species include flame-leaf sumac (*Rhus lanceolata*), California redbud (*Cercis orbiculata*), eastern redbud (*Cercis canadensis*), mountain laurel (*Sophora secundiflora*), Texas buckeye (*Aesculus glabra*), agarita (*Berberis trifoliolata*), yaupon (*Ilex vomitoria*). Croton (*Croton* sp.), twisted leaf yucca (*Yucca rupicola*), Lindheimer's senna (*Cassia lindheimeri*), prickly pear cactus (*Pontiac* sp.), and buffalograss (*Buchloe dactyloides*) are common ground cover species present in the more open areas.

2.3 Physiography and Surface Drainage

The subject site is within the Lake Austin Watershed, as delineated by the City of Austin (COA, 2009). Topographically, the site ranges from approximately 490 to 582 feet above mean sea level. Overland sheet flow flows toward Lake Austin to east and into the storm drainage along RM 2222. As shown on Figure 4, part of the subject site along Lake Austin is within the 100-year floodplain (FEMA, 2006).

The subject site is within the Edwards Plateau physiographic region (Godfrey, et al. 1973). The subject site is within the Edwards Plateau Region of Texas (Wermund, 1996). The Edwards Plateau region is in west central Texas and is commonly known as the Hill Country. It is bounded on the east and south by the Balcones Fault. To the north, it extends to the Western Cross Timbers of the Oak Woods and Prairies region and grades into the Plains regions. The Llano Uplift region also forms part of the northern border (McMahan et.al 1984).

2.4 Soils

Topography in this area is undulating to hilly with some sections that are deeply dissected. Most is rapidly drained to less sloping stream valleys and some stony plains that are broad and relatively flat. Soils of this region are mostly stony. Some series are somewhat deeper and less stony on flat divides and in stream valleys. The underlying material of the Edwards Plateau soils is erosion-resistant limestone and limestone interbedded with clay and marl. (Godfrey, et al. 1973).

As shown on Figure 3 (Attachment 1), the subject site is mapped within the Slidell-Topsey-Brackett soil association and Tarrant and Speck soils, 0 to 2% slopes (TcA) as described on page 1 of the Geologic Assessment.

Following is a description of the soils that occur on the property (Werchan and Coker, 1983 and NRCS Soil Survey Staff, 2005).

TABLE 1 Table of Soils

SOIL NAME	SOIL DEPTH (FEET)	SOIL TYPE	UNDERLYING MATERIAL	PERMEABILITY	AVAILABLE WATER CAPACITY	SHRINK-SWELL CAPACITY
Tarrant soils and Urban land, 5 to 18% slopes (TeE)	C. Moderately Slow	0.3 to 1.2	hard limestone	low	clay or clay loam	high
Tarrant soils and Urban land 18 to 40% slopes (TeF)	C. Moderately Slow	0.3 to 1.2	hard limestone	low	clay or clay loam	high

2.5 Edwards Aquifer Zone

The subject site is found within the Edwards Aquifer Recharge Zone and within the Southern Edwards Aquifer Recharge Zone as mapped by the City of Austin Watershed Regulation Areas Map (COA, 2009) and the TCEQ Recharge Zone Boundary Maps (TCEQ, 2005).

The Recharge Zone is known as the area where the stratigraphic units constituting the Edwards Aquifer are exposed at the surface and where water may filter in the aquifer through permeable features such as cracks, fissures, caves and other openings in these layers (TCEQ, 1999). The Recharge Zone includes other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features may create a potential for recharge of surface waters into the Edwards Aquifer (TCEQ, 1999). The Recharge Zone is identified as that area designated as such on official maps located in the appropriate regional office and groundwater conservation districts. TCEQ Edwards Aquifer Rules (30 TAC 213) require a Water Pollution Abatement Plan and Geologic Assessment for regulated activities within the Edwards Aquifer Recharge Zone (or areas draining toward it). Under the referenced definition a regulated activity does not include construction of single-family residences on lots that are larger than five acres, where no more than one single-family residence is located on each lot

2.6 Geology

One fault crosses the site near the intersection of Lakeshore Drive and Island Way and forms a fault scarp forms a second rimrock feature (S-2) (UT-BEG, 1981). This fault forms the boundary of the Edwards Aquifer Contributing and Recharge Zone.

A review of existing literature and field observations show that the site is underlain by the Edwards Limestone, a Cretaceous-age geologic formation (Garner et al., 1976). No published fault locations are found within a 0.5-mile radius. The Edwards Limestone (Ked) is a thinly to massively bedded, hard to soft, cherty, fossiliferous, fine-grained limestone and dolomite that commonly have red clay and calcite associated with solution features, such as caves and collapsed zones. The Edwards Limestone is known to form springs, caves, and voids. Garner and Young (1976) describe Edwards Group limestone in the area as gray-brown to gray, thin- to medium-bedded dolomite and dolomitic limestone. The Edwards Group Limestone forms caves and voids related primarily to bedding planes in Williamson County. Edwards Group Limestone is considered equivalent to the undifferentiated Kainer Formation of the Edwards Group. Edwards Limestone ranges in total thickness from about 265 to 345 feet. The thickness of the Edwards Limestone on the subject site is the bottom 20 feet of the rock unit. The lithology of the Edwards Group Limestone includes marine sediments consisting of fossiliferous mudstones and wackestones that grade upward into dolomitic mudstones and evaporites and terminate in Miliolid grainstone.

The uplands of this site form an irregularly shaped peninsula of Edwards limestone, marked at its edges by canyon rimrock (Feature S-1 as show on Figure 4). It is contiguous but dissected from expansive northern Edwards Aquifer Recharge Zone to the north and northeast. Limestone on the subject site is highly eroded along bedding plane partings. Erosion has resulted in a peninsular shaped cap of Edwards Limestone that is about 20 feet thick forming the cliffs along the rimrock described as S-1, forming the small solution cavities along seepage points in the incised canyon (S-3, S-4, S-5, S-6, and S-7)..

3.0 CRITICAL ENVIRONMENTAL FEATURES

No potential critical environmental features as defined by the City of Austin were found on or within 150 feet from the subject property. However, Escarpment did find one rimrock feature that meets the City of Austin definition. The other features are small solution cavities that form along the face of the S-1 rimrock. Feature S-2 is a small scarp face that is not long enough to be considered rimrock and it already contains a building immediately upslope.

Escarpment surveyed the site, reviewed aerial photographs, topographic maps, and water well records to assess the presence of any Critical Environmental Features (CEFs) on the subject site. The City of Austin definition of a critical environmental feature includes caves,

sinkholes, springs, wetlands, bluffs, canyon rimrock, water wells, riparian woodlands, and significant recharge features.

3.1 Water Well Search

No water wells were found on or adjacent to the property (TWDB, 2013). If any wells are found on-site, abandoned wells on site must be capped or properly abandoned according to the Administrative Rules of the Texas Department of Licensing and Regulation, 16 Texas Administrative Code (TAC), Chapter 76, effective 3 January 1999.

3.2 Wetland Status

Based on the literature review and field investigation, Escarpment observed areas within the subject site that would be considered jurisdictional "waters of the US" and navigable waters of Lake Austin are subject to regulation by the Corps of Engineers. Photo 2 shows a view of the shoreline vegetation, facing north from the dock on Lake Austin (Lat/Long in Decimal Degrees—WGS84: North 30.30144 West -097.78588). Aquatic vegetation associated with Lake Austin occurs below the ordinary high water mark of Lake Austin. The ordinary high water mark is considered the edge of the jurisdictional and navigable water ways (in the absence of wetland vegetation).

The National Wetland Inventory maps show potential jurisdictional and navigable waterways associated with Lake Austin on the property (USFWS, 1993). A copy of the National Wetland Inventory map is provided on Figure 5 (Attachment 1). USGS topographic maps and field investigation show one defined stream channel within an incised canyon that runs along the southern property boundary into Lake Austin. No bed and bank condition and not wetland vegetation were observed with the tributary; however it is defined by a canyon that is 15 to 20 feet deep and ranges from 10 to 15 feet wide.

3.3 Rimrock and Bluff Search

Escarpment found one rimrock feature (S-1) that meets the City of Austin rimrock criteria (284 feet long). Rimrock S-1 ranges in height from about 12 to 20 high and wraps around the eastern edge of the property, bending back toward the west along the canyon upstream to the wooden stairs at the top of the canyon. Feature locations are shown on the Site Geologic Map (Figure 4).

Feature S-2 is a fault small scarp face that is not long enough to be considered rimrock and it already contains a building immediately upslope. The contact between the Edwards Limestone (downstream) and Upper Glen Rose Limestone (upstream from the fault scarp).

One fault crosses the site near the intersection of Lakeshore Drive and Island Way and forms a fault scarp forms a second rimrock feature (S-2). This segment of rimrock is 42 feet long by 4 to 6 feet high. S-2 contains a building immediately upslope.

No bluffs (per the City of Austin definition) were observed on site. All cliffs are less than 20 feet so they do not meet the definition of a bluff, only rimrock (despite the label on the plat map provided – Attachment 1).

The City of Austin Land Development Code (25-8-281-D). defines canyon rimrock as an abrupt vertical rock outcrop of more than 60% slope (31 degrees), greater than 4 feet vertically, and a horizontal extent equal or greater than 50 feet

Bluffs are defined as an abrupt vertical change in topography of more than 40 feet with an average slope steeper than four feet of rise for one foot of horizontal travel (400 % or 76 degrees) (COA,LDC 25-8-281).

3.4 Potential Recharge Features

Features S-3, S-4, S-5, S-6, and S-7 are small solution cavities that form along the base of the vertical face of the rimrock labeled S-1 that runs along the incised, stair-step channel. Most of these solution cavities are damp enough to support maidenhair ferns. No caves or sinkholes were found on the subject site. None of these features were rated as sensitive recharge features.

One fault crosses the site near the intersection of Lakeshore Drive and Island Way and forms a fault scarp forms a second rimrock feature (S-2) (UT-BEG, 1981). This fault forms the boundary of the Edwards Aquifer Contributing and Recharge Zone.

Karst features include point recharge feature, sinkhole, and springs. Karst is defined as a type of terrain that is formed primarily chemical solution of the bedrock. More specifically in Central Texas, karst is formed by the slow dissolution of calcium carbonate from limestone bedrock by mildly acidic groundwater. The characteristic landforms of karst regions are closed depressions of various size and arrangement, disrupted surface drainage, caves, point recharge features and underground drainage systems (White, 1988).

4.0 THREATENED AND ENDANGERED SPECIES HABITAT ASSESSMENT

Federally listed, endangered species that are known to occur in Travis County near the subject site include the golden-cheeked warbler, black-capped vireo, and terrestrial karst invertebrates (BCCP, 2008).

The Balcones Canyonland Conservation Plan (BCCP) Map of the Permit Area, dated 19 October 1996, is a map of all of Travis County, including the subject site, which reflects estimates of habitat for various threatened or endangered species based in part on aerial photographs and non-site-specific assessments (BCCP, 1996). The BCCP map shows the site as within confirmed golden-cheeked warbler habitat (Zone 1) and with potentially suitable terrestrial karst invertebrate (terrestrial karst invertebrates) habitat (Zone 3). BCCP data shown on Figure 5 is not comprehensive and is not intended to be a substitute for presence/absence surveys, field investigations, or consultation with BCCP or USFWS. No presence/absence surveys were conducted at the time of this report.

There are 10 endangered species protected in Austin area (other than migratory species). Two are birds, the black-capped vireo (*Vireo atricapillus*) and the golden-cheeked warbler (*Dendroica chrysoparia*). One is an aquatic salamander called the Barton Springs salamander (*Eurycea sosorum*). The remaining seven are karst invertebrates: the Tooth Cave pseudoscorpion (*Microcreagris texana*), the Tooth Cave spider (*Neoleptoneta myopica*), the Tooth Cave ground beetle (*Rhadine persephone*), the Kretschmarr Cave mold beetle (*Texamaurops reddelli*), the Bone Cave harvestman (*Texella reyesi*), Bee Creek Cave harvestman (*Texella reddelli*), and the Coffin Cave mold beetle (*Batrisodes texanus*), which have been placed on the federal endangered species list since 1987.

4.1 GOLDEN-CHEEKED WARBLER

The unnamed tributary to Lake Austin that forms a canyon contains mature Ashe juniper trees and broad-leaved oaks that meet the definition of potential habitat for the golden-cheeked warbler (GCW). This canyon is an isolated wooded remnant with development on all sides. The uplands are relatively clear and lacks a closed canopy cover and deciduous oaks that are known habitat. The partially cleared uplands do not exhibit habitat characteristics of the GCW. The BCCP map shows the site as within confirmed golden-cheeked warbler habitat (Zone 1).

It would be helpful to know if this site has not already been a participant in the BCCP (transfers with the deed), it is eligible for participation in the BCCP: BCCP has an application process and Guidance on Endangered Species available at:
http://www.co.travis.tx.us/tnr/bccp/endangered_species.asp.

Golden-cheeked warblers are songbirds that average about 4.5 inches long with olive-green back and rump plumage, a black bib (except for the first year of life when the bib is often white), and deep yellow cheeks. The female is a drab olive-green with black streaks and dull yellow throat and chin (Pulich, 1976). Warblers arrive in central Texas from wintering grounds in Mexico and next from March to August (Pulich, 1976). Golden-cheeked warbler habitat in central Texas typically consists of mature Ashe juniper and broad-leaved oak woodlands, with a high percentage of canopy coverage within and adjacent to incised canyons of central Texas.

4.2 BLACK-CAPPED VIREO

Due to a lack of scrubby vegetation within an open canopy, it is Escarpment's opinion that the subject site does not provide a suitable habitat for the BCV. No suitable habitat was observed by Escarpment on immediately adjacent properties.

The black-capped vireo is a 4.5-inch long insectivorous bird (Robbins, 1966). Males are typically olive green above and white below with yellow flanks. The crown and upper half of the head is black with partial white eye-rings and lores. Females have a duller color and slate-gray crown and undersides with a greenish yellow tint. The black-capped vireo typically nests in scattered trees with dense clumps of shrubs that are thick from top to ground level and are interspersed with bare rock and open grassland within central Texas. Common vegetation within these clumps of shrubs includes shin oak (*Quercus sinuate* var. *breviloba*), live oak, evergreen sumac (*Rhus virens*), Texas persimmon (*Diospyros texana*), agarita (*Berberis trifoliolata*), and Ashe juniper (*Juniperous Ashei*).

4.3 TERRESTRIAL KARST INVERTEBRATES

No karst features or potential caves (other than small solution cavities in the canyon rimrock) were found during the site investigation by a geologist (according to USFWS karst survey protocols). The subject site is mostly underlain by Edwards Limestone geologic formation (Garner et al., 1976, Proctor et al., 1981), which is a known karst zone. The subject site is mapped as within Zone 1 (areas known to contain potential endangered cave species habitat) which are based in part on geologic maps and soil surveys (Veni and Associates, 1991). As defined by the Endangered Karst Invertebrates Recovery Plan for Travis and Williamson Counties, Texas, the Property is located within a known karst fauna region (USFWS, 1994).

Seven species of invertebrates known only from caves in Travis and Williamson counties, Texas, are listed by the U.S. Fish and Wildlife Service (USFWS) as endangered species under the provisions of the Federal Endangered Species Act (ESA). The seven species are *Texella reddelli*, *Texella reyesi*, *Tartarocreagris texana*, *Neoleptoneta myopica*, *Rhadine persephone*, *Texamaurops reddelli*, and *Batrissodes texanus*. The USFWS considers potential threats to these species to include destruction and/or deterioration of habitat by commercial, residential,

and road construction; filling of caves; loss of permeable cover; contamination from such things as septic effluent, sewer leaks, runoff, and pesticides; predation by and competition with nonnative fire ants; and vandalism.

The seven species of cave-dwelling invertebrate species in Travis and Williamson Counties are listed as endangered and described as follows.

1. Tooth Cave pseudoscorpion (*Microcreagris texana*) usually found under rocks, predators of microarthropods.
2. Tooth Cave spider (*Neoleptoneta myopica*) a sedentary aerial spider that hangs from a small tangle or sheet web on long, thin legs.
3. Bee Creek Cave harvestman (*Texella reddelli*) has large raptorial pedipalps to seize and hold prey. Tend to walk rather slowly and deliberately, unlike spiders which tend to move faster.
4. Tooth Cave ground beetle (*Rhadine persephone*) largest, most visible and active of the seven. Runs rapidly and patrols the floor area in search of prey and may feed upon cave cricket eggs.
5. Kretschmarr Cave mold beetle (*Texamaurops reddelli*) found in total darkness under and among rocks and buried in silt. These predatory beetles have well-developed mouth parts.
6. Bone Cave harvestman (*Texella reyesi*) especially sensitive to dry conditions thus requires very moist and humid caves.
7. Coffin Cave mold beetle (*Batrisodes texanus*) found in total darkness under rocks and believed to be a predator.

4.4 SPECIES OF CONCERN

In Travis County, "species of concern" include three plant species: Canyon mock orange (*Philadelphus ernestii*), Texabama croton (*Croton alabamensis* var. *texensis*), and bracted twistflower (*Streptanthus bracteatus*). "Species of concern" are those species that may become endangered if not protected.

No potential habitat or occurrences of the canyon mock-orange were observed on site. The canyon mock-orange is a small deciduous shrub (1 to 5 feet tall) with white fragrant flowers that smell like orange blossoms or cumin. Leaves are oval to elliptical, opposite, dark green, and covered with small, straight, soft hairs. It grows in full shade to full sun on rocky cliffs Edwards Plateau and on well-drained rock outcrops of the Cow Creek limestone and Edwards limestone. Flowering in April and May, it is found only rarely in the Hill Country usually near the top of canyons with flowing streams where it cascades over the rocky cliffs.

No potential habitat or occurrences of the *Texabama Croton* or *Alabama Croton* was observed on the subject site. It was once believed to be endemic (native only to a single area) to only three counties in Alabama and Tennessee, until in 1989 populations were found in Texas. Only 16 populations are known in Texas. In Texas, it grows on limestone slopes, in forest understory, or in full sun. Its evergreen leaves are apple green with silvery undersides, due to silvery scales that are also found on the petioles and twigs, and the older leaves turn orange in the fall. Pale yellow-green blooms appear on 1 to 1.5-inch racemes in the spring. *Croton alabamensis* is listed as G3, or globally vulnerable, due to its restricted range, and var. *texensis* is listed on the endangered watch list.

No potential habitat or occurrences of the bracted twistflower were observed on the subject site. It is an annual plant with delicate pink flowers. It usually grows no taller than 3 feet. It is usually found on rocky limestone slopes and terraces in juniper-oak woodlands. When flowering during April and May, it is difficult to see amid the over-wintering brown shrubs. Leaves on the upper part of the plant wrap around the stem like those of local common mustards and have smooth margins. Leaves on the lower stem are on long stalks and are often deeply incised, like those of a dandelion. Over the last 150 years, the bracted twistflower has been observed in seven counties, but more recently is restricted to Bexar, Medina, Travis, and Uvalde counties. It grows in thick, dense brush on thin clay soils overlaying limestone with a canopy cover between 25 to 100 percent and above perennial springs or creeks, on or near the ridge tops.

5.0 Summary of Findings

The unnamed tributary to Lake Austin that forms a canyon along the southern property boundary and Island way, contains mature Ashe juniper trees and broad-leaved oaks that meet the definition of potential habitat for the golden-cheeked warbler (GCW). This canyon is an isolated wooded remnant with roads and development on all sides. The uplands are relatively clear and lacks a closed canopy cover and deciduous oaks that are known habitat. The partially cleared uplands do not exhibit habitat characteristics of the GCW. Nevertheless, woodlands on the property may be considered contiguous with potential golden-cheeked warbler that follows the wooded canyons and streams nearby. The BCCP map shows the site as within confirmed golden-cheeked warbler habitat (Zone 1). This site is eligible for participation in the BCCP: BCCP has an application process and Guidance on Endangered Species available at: http://www.co.travis.tx.us/tnr/bccp/endangered_species.asp. Link to application for BCCP: <http://www.co.travis.tx.us/tnr/bccp/pdfs/application.pdf>

No karst features, perennial springs, or potential caves (other than small solution cavities in the canyon rimrock) were found during the site investigation by a geologist (according to USFWS karst survey protocols). No potential sensitive recharge features as defined by the City of Austin were found on or within 150 feet from the subject property.

Escarpment found one rimrock feature (S-1) that meets the City of Austin rimrock criteria (284 feet long). Rimrock S-1 ranges in height from about 12 to 20 high and wraps around the eastern edge of the property, bending back toward the west along the canyon upstream to the wooden stairs at the top of the canyon.

Feature S-2 is a fault small scarp face that is not long enough to be considered rimrock and it already contains a building immediately upslope. The contact between the Edwards Limestone (downstream) and Upper Glen Rose Limestone (upstream from the fault scarp). One fault crosses the site near the intersection of Lakeshore Drive and Island Way and forms a fault scarp forms a second rimrock feature (S-2). This segment of rimrock is 42 feet long by 4 to 6 feet high. S-2 contains a building immediately upslope.

Features S-3, S-4, S-5, S-6, and S-7 are small solution cavities that form along the base of the vertical face of the rimrock labeled S-1 that runs along the incised, stair-step channel. Most of these solution cavities are damp enough to support maidenhair ferns. No caves or sinkholes were found on the subject site. One fault crosses the site near the intersection of Lakeshore Drive and Island Way and forms a fault scarp forms a second rimrock feature (S-2). None of these features were rated as sensitive recharge features.

A field was conducted to assess the potential for karst features reconnaissance by a geologist (according to USFWS karst survey protocols). No karst features or potential caves were found

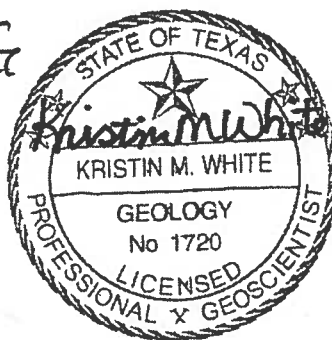
during the site investigation. The subject site is underlain by Edwards Limestone geologic formation (Garner et al., 1976, Proctor et al., 1981), which is a known karst zone. The subject site is mapped as within Zone 1 (areas known to contain potential endangered cave species habitat) which are based in part on geologic maps and soil surveys (Veni and Associates, 1991).

The results of this survey do not preclude the possibility of finding subsurface voids or abandoned test or water wells during the clearing or construction phases of the proposed project. If a subsurface void is encountered during any phase of the project, construction should be halted until the TCEQ (or appropriate agency) is contacted and a geologist can investigate the feature.

For Escarpment Environmental,

Kristin M White, PG

Kristin M. White, PG¹
Principal Geologist



2 June 2014
Date

The seal appearing on this document was authorized by Kristin M. White, P.G. 1720 on 2 June 2014.

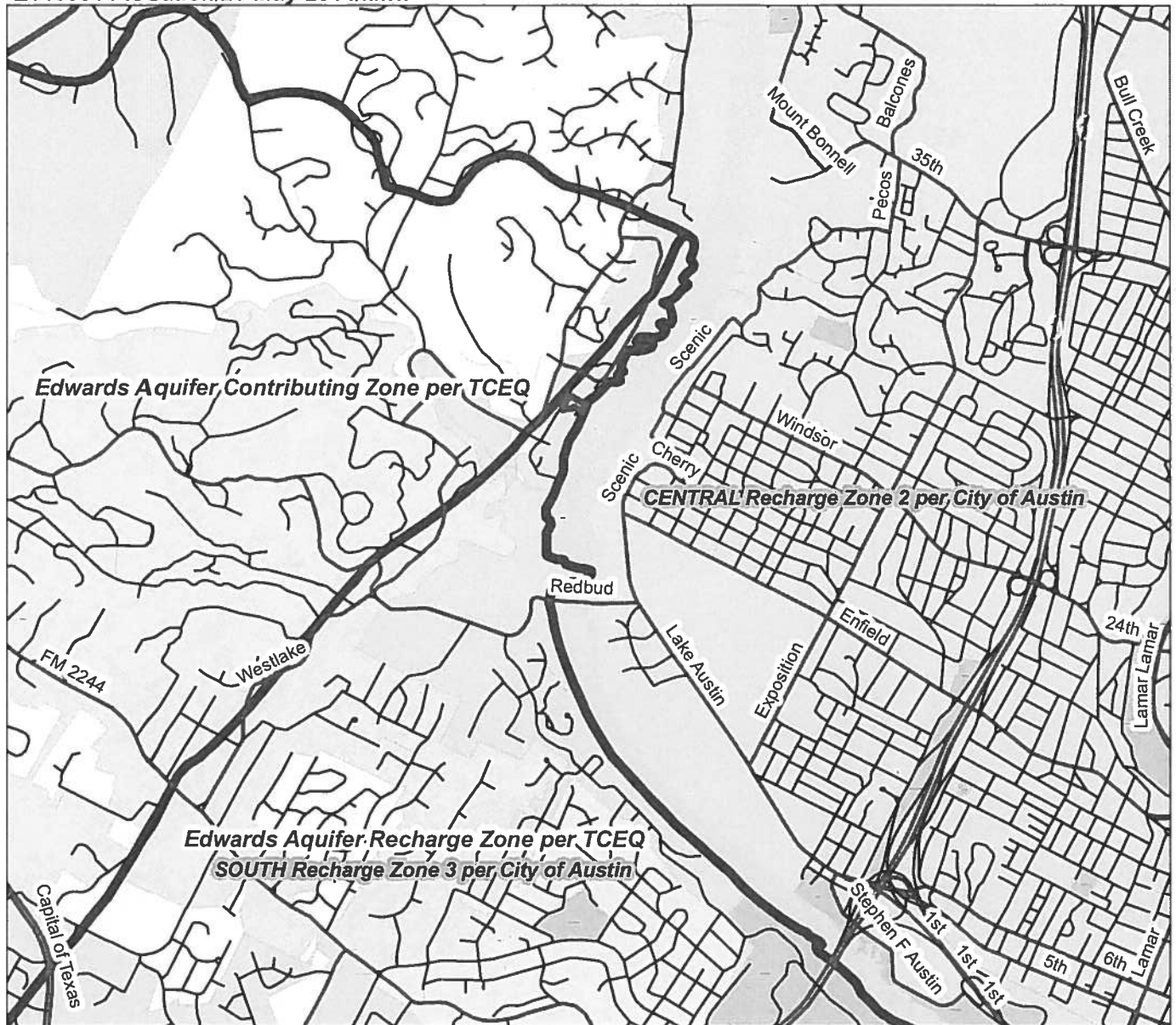
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- Wermund, E.G., 1996 Physiographic Map of Texas, State Map 5, Bureau of Economic Geology, The University of Texas.
- White, William B., 1988, Geomorphology and Hydrology of Karst Terrains, Oxford University Press, New York, 464 pages.
- Woodruff, C., 1986, Environmental Geology of the Lakeline Tract, Williamson County, Texas.

Attachment 1
Figures

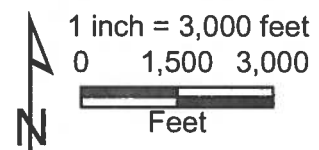


Basemap, CAPCOG, 2006

Legend

- Property Boundary
- CITY STREET
- COUNTY ROAD
- FARM TO MARKET
- TOLL ROAD
- Edwards Recharge Zone Boundary per TCEQ, 2005
- NORTH Recharge Zone (City of Austin, 2008)
- Local Park

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Travis County

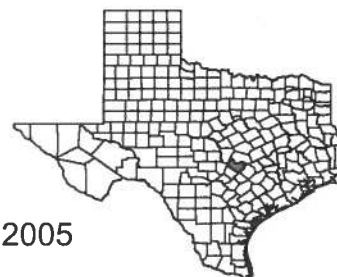


Figure 1
Location Map
1.57205-acre property
Lakeshore Addition
Lots 15 & 16, part of Lot 14
2009 Island Way
Austin, Travis County, Texas



Basemap, USGS Jollyville, Texas, Quadrangle Map, 1983.
 Edwards Aquifer Recharge Zone: Texas Commission on
 Environmental Quality (TCEQ) 2005 and City of Austin: (COA) 2008
 Water Wells: Texas Water Development Board (TWDB) 2012

Legend

- Property Boundary
- Edwards Recharge Zone Boundary per TCEQ, 2005
- Watershed (COA, 2007)
- Stream (USGS NHD, 1999)
- Floodplain (FEMA, 2006)

NORTH Recharge Zone (City of Austin, 2008)

- CENTRAL
- NORTH
- SOUTH

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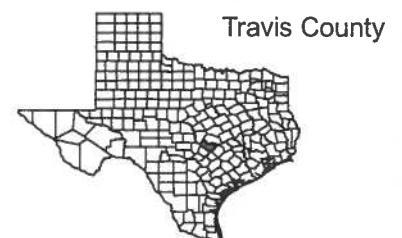
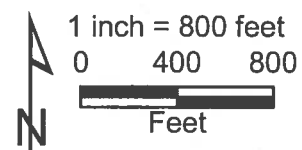





Figure 2
Site Boundary Map
 1.572025-acre property
 Lakeshore Addition
 Lots 15 & 16, part of Lot 14
 2009 Island Way
 Austin, Travis County, Texas



Aerial Photograph: CAPCOG, Austin West Quad, 2008
Soil: NRCS Soil Survey Staff, 2006

Legend

-  Property Boundary
-  Property Boundary
-  Stream (USGS NHD, 1999)

Tarrant soils and Urban land, 5 to 18% slopes (TeE)
Tarrant soils and Urban land 18 to 40% slopes (TeF)
Open Water (W)

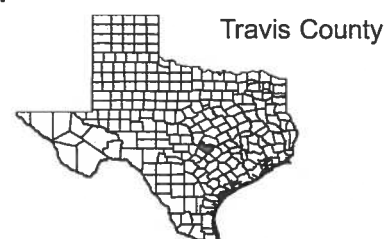
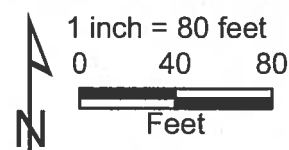


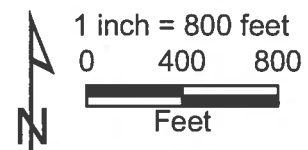
Figure 3

Soil Association Map
1.572025-acre property
Lakeshore Addition
Lots 15 & 16, part of Lot 14
2009 Island Way
Austin, Travis County, Texas





Basemap, National Wetland Inventory Map, USGS Austin West, Texas, Quadrangle Maps, 1993.



Legend

 Property Boundary

POWHh Palustrine, open water, permanently flooded, diked/impounded

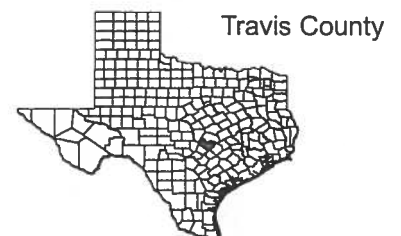
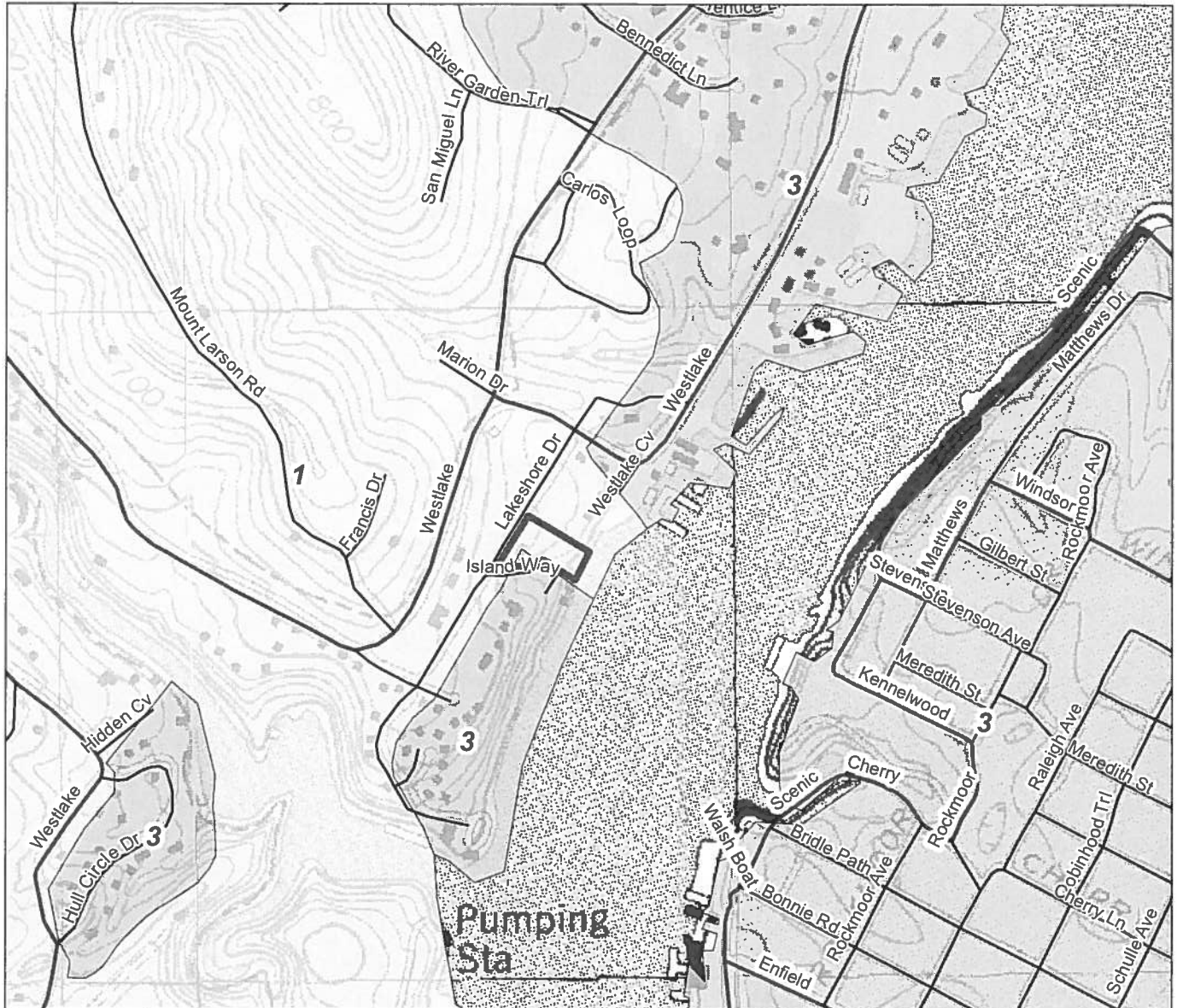


Figure 5

National Wetland Inventory Map
1.572025-acre property
Lakeshore Addition
Lots 15 & 16, part of Lot 14
2009 Island Way
Austin, Travis County, Texas



*Modified from: (BCCP) Balcones Canyonland Conservation Plan, 1996, Map of the Permit Area.
(not to be used in place of published BCCP maps)



Legend

Property Boundary

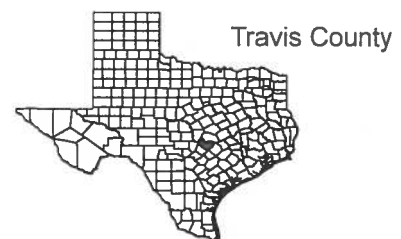
BCCP Approx. Habitat Zones

Potential Karst Invertebrate Habitat

Zone 1 - Confirmed Golden-Cheeked Warbler (GCW) Habitat

Zone 2 - Unconfirmed GCW Habitat

Zone 3 - Not Known to be GCW Habitat





Basemap, USGS Austin West, Texas, Quadrangle Map, 1983.

Karst Zones: Veni, George and Associates,

1991, Endangered Cave Species Karst Zone Map

Austin West Quadrangle, George Veni and Associates, Austin, Texas.



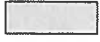
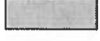
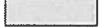
Karst Fauna Regions (USFWS, 1994)

(not to be used in place of karst survey)

Austin West Quadrangle, George Veni and Associates, Austin, Texas.

Basemap:

Legend

-  Property Boundary
-  Zone 4 - No Endangered Cave Species (ECS)
-  Zone 3 - Low Probability E.C.S.
-  Zone 2 - High Probability E.C.S.
-  Zone 1 - Known E.C.S.

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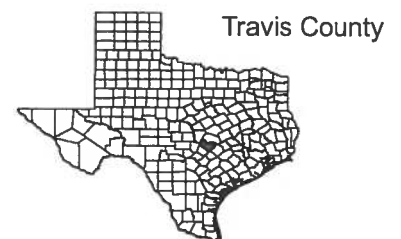
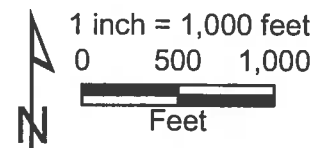


Figure 7

Karst Fauna Region Map

1.572025-acre property

Lakeshore Addition

Lots 15 & 16, part of Lot 14

2009 Island Way

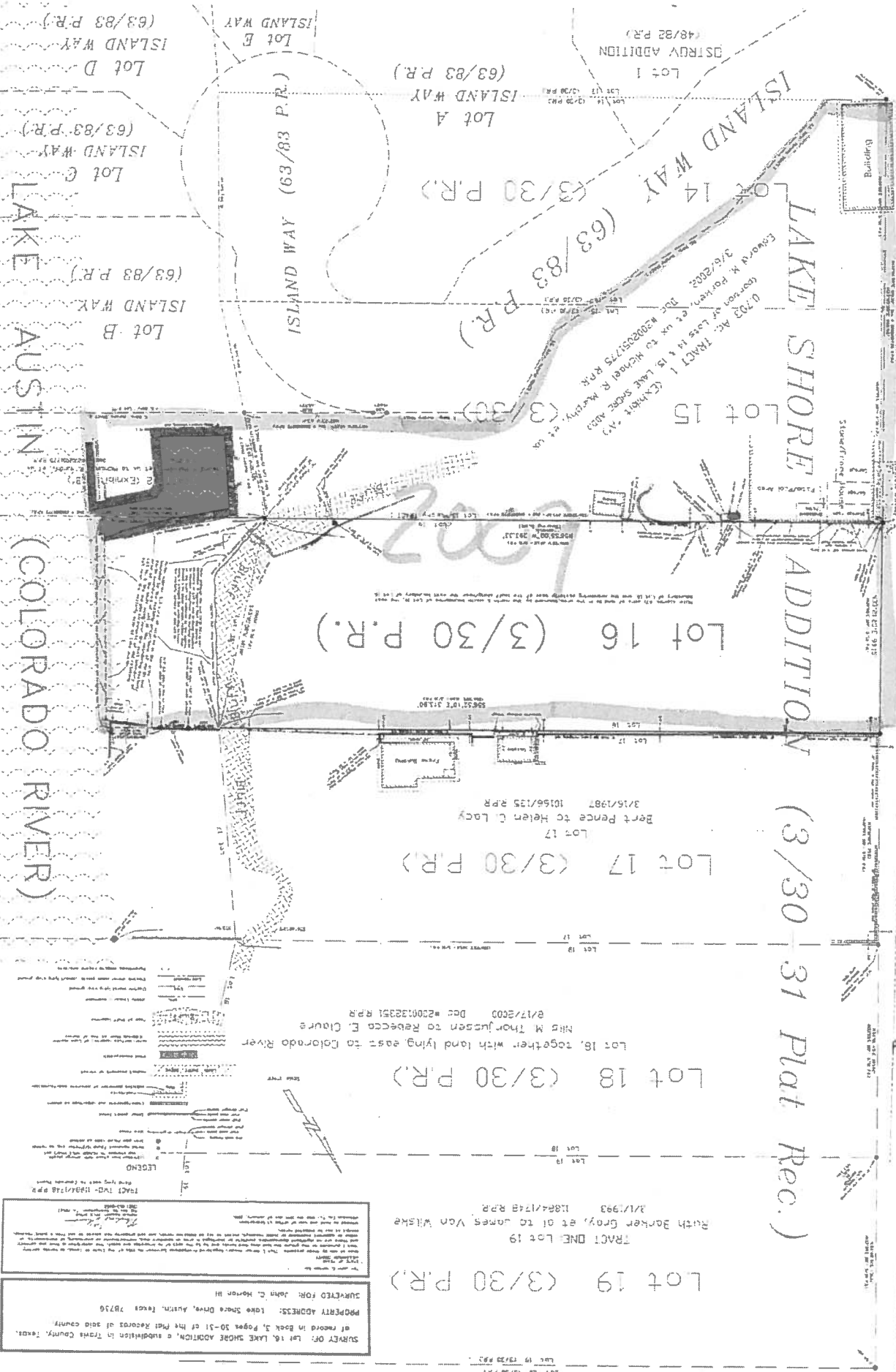
Austin, Travis County, Texas

LAKE SHORE DRIVE

LAKE SHORE DRIVE

LAKE SHORE ADDITION (3/30 31 Plat Rec.)

LAKE AUSTIN (COLORADO RIVER)



TRACT TWO - 1184/1718 P.P.R.
SURVEYED FOR: John C. Horton III
PROPERTY ADDRESS: Lake Shore Drive, Austin, Texas 78756
SURVEY OF: Lot 16, LAKE SHORE ADDITION, a subdivision in Travis County, Texas,
as shown in Book 3, Pages 30-31 of the Plat Records of said county.

HEADQUARTERS SURVEYING
P.O. Box 58
Georgetown, Texas 78626
(512) 863-5442

RESUBDIVISION OF A PORTION OF LOTS 20 AND 21, LAKE SHORE ADDITION SUBDIVISION (87/132A P.R.)
Lot 2 (87/132A P.R.)
ST. TROPIC YACHT AND MARINA (86/75D P.R.)
Lot 3

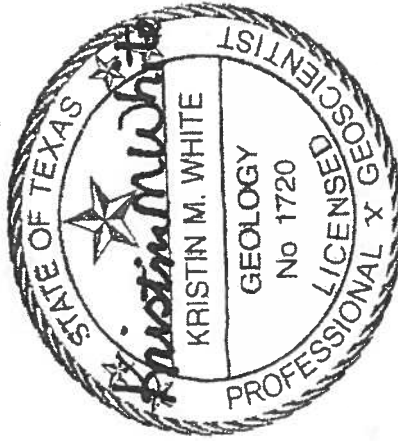
SP-2013-0504SDS

2009 Lake Shore Drive

Attachment 2
Critical Environmental Feature Table
And
Texas Commission on Environmental Quality Geologic Assessment Table

GEOLOGIC ASSESSMENT TABLE												
PROJECT NAME: 1.5-acre Lakeshore Addition												
JOB NUMBER: E1400014-GA												
LOCATION			FEATURE CHARACTERISTICS							EVALUATION		
1A	1B	1C	2A	2B	3	4	5	5A	6	7	8A	8B
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)	TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE
						X Y Z						
S-1	N30.30155	W97.78596	O	5	Ked			No			N	5
S-2	N30.30147	W97.78707	F	20	Ked/Kru			No	1/10		N	9
S-3	N30.30149	W97.78621	SC	20	Ked			No			N	5
S-4	N30.30152	W97.78627	SC	20	Ked			No			N	5
S-5	N30.30153	W97.78634	SC	20	Ked			No			N	5
S-6	N30.30153	W97.78647	SC	20	Ked			No			N	5
S-4	N30.301475	W97.78651	SC	20	Ked			No			N	5
												8B
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8B RELATIVE INFILTRATION RATE
HIGH > 35
INTERMEDIATE 20 TO 34
LOW 5 TO 19



Project Name:	1.572025-acre Lakeshores Addition	6	Primary Contact Name:	Kristin Miller White, PG, Escarpment Environmental
Project Address:	2009 Island Way	6	Phone Number:	512-415-6986
Date:	4/28/2014	7	Prepared By:	Kristin Miller White, PG, Escarpment Environmental
Environmental Assessment Date:	6/2/2014	8	CEFS Located? (yes,no) :	NO

FEATURE TYPE	FEATURE ID	(eg S-1)	FEATURE LONGITUDE coordinate	FEATURE LATITUDE coordinate	(WGS 1984 in notation)	WETLAND DIMENSIONS X	Y	RIMROCK DIMENSIONS (ft) Length	Avg Height
(Wetland, Rimrock, Recharge Feature, Seep, Spring)	S-1		N30.30155	N30.30155	WGS84			284	15

City of Austin Use Only
WPDRC CASE NUMBER:

For rimrock, locate the midpoint of the segment that describes the feature.	For wetlands, locate the approximate centroid of the feature and the estimated area.	For a spring or seep, locate the source of groundwater that feeds a pool or stream.
		

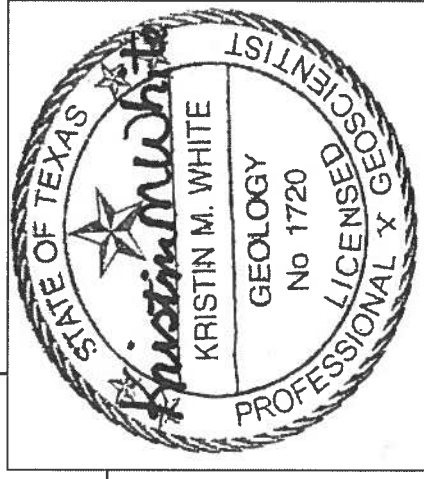
I have read, I understand, and I have followed the City of Austin Land Development Code and Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213. The seal appearing on this document was authorized by Kristin M. White, P.G. 1720 on 08 February 2013.

For Escarpment Environmental,

Kristin-M White, PG

Signature

1-Jun-14
Date



Attachment 3
Field Photographs



ESCARPMENT ENVIRONMENTAL
 Geologic & Environmental Consulting for Land Development
 700 LAVACA, SUITE 1400 AUSTIN, TEXAS 78701
 WWW.ESCARPMENTENV.COM

Site Photographs (Page 1 of 5)
1.572025-acre property
Lakeshore Addition
Lots 15 & 16, part of Lot 14
2009 Island Way
Austin, Travis County, Texas
EI400014-EAHA

Photo 1

View from subject site, Lakeshore Addition,
 facing east toward Lake Austin.

Lat/Long in Decimal Degrees—WGS84.
 North 30.30175 West -097.78638



Photo 2

**View of shoreline vegetation, facing
 North from the dock.**

Lat/Long in Decimal Degrees—WGS84.
 North 30.30144 West -097.78588



Photo 3

View of lakefront canyon rimrock (S-1), facing
 west.

Lat/Long in Decimal Degrees—WGS84.
 North 30.30144 West -097.78592

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WWW.ESCARPMENTENV.COM

Site Photographs (Page 2 of 5)
1.572025-acre property
Lakeshore Addition
Lots 15 & 16, part of Lot 14
2009 Island Way
Austin, Travis County, Texas
E1400014-EAHA

Photo 4

Feature S-1 (Rimrock)

View of canyon rimrock (S-1) along northern side of canyon, facing west. S-1 is 284 feet long.

Lat/Long in Decimal Degrees—WGS84.
North 30.30122 West -097.78631



Photo 5

Feature S-3

Two solution cavities (1-2 feet long by 6 to 8 inches tall and 1 foot deep) in vertical wall of rimrock (S-1) along base of canyon rimrock.

Lat/Long in Decimal Degrees—WGS84
North 30.30138 West -097.78624



Photo 6

Feature S-4

Solution cavity (1-foot in diameter) in vertical face of canyon rimrock (S-1), near the base of the Edwards Limestone.

Lat/Long in Decimal Degrees—WGS84
North 30.30155 West -097.78625

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Site Photographs (Page 3 of 5)

1.572025-acre property

Lakeshore Addition

Lots 15 & 16, part of Lot 14

2009 Island Way

Austin, Travis County, Texas

E1400014-EAHA

Photo 7

Feature S-5

Solution cavity in vertical face of canyon rim-rock (S-1). S-5 is 2 feet long by 1 foot tall and 3 feet deep (horizontally)

Lat/Long in Decimal Degrees—WGS84.

Photo 8

Feature S-6

Solution cavity in vertical face of canyon rimrock that is 1.5 feet long by 6 inches tall and 1 foot deep (horizontally)

Lat/Long in Decimal Degrees—WGS84.

North 30.30153 West -097.78647

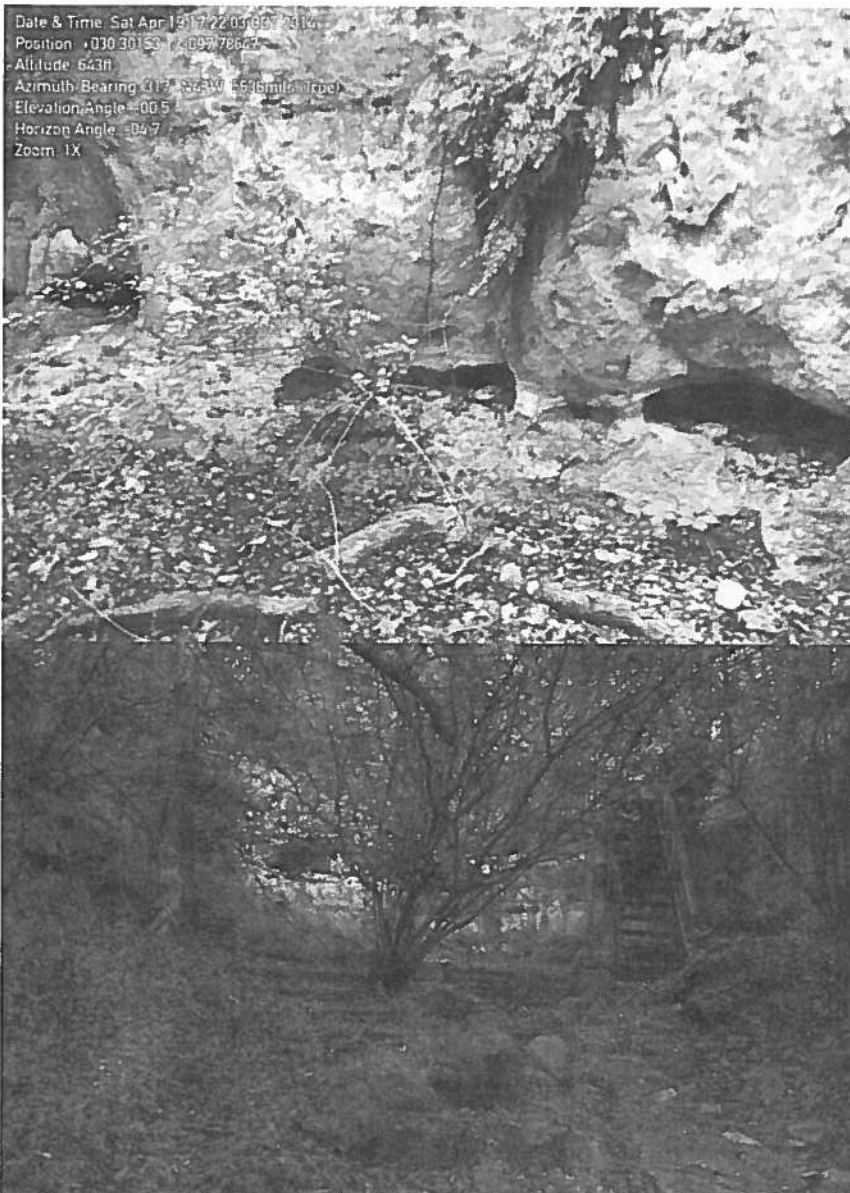
Photo 9

Feature S-1 (rimrock) and Feature S-7 (solution cavity/seep)

View of stair-step topography and rimrock (also known as the knickpoint) (end point of Feature S-1).

Lat/Long in Decimal Degrees—WGS84.

North 30.30155 West -097.78676



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Site Photographs (Page 4 of 5)
1.572025-acre property
Lakeshore Addition
Lots 15 & 16, part of Lot 14
2009 Island Way
Austin, Travis County, Texas
EI400014-EAHA

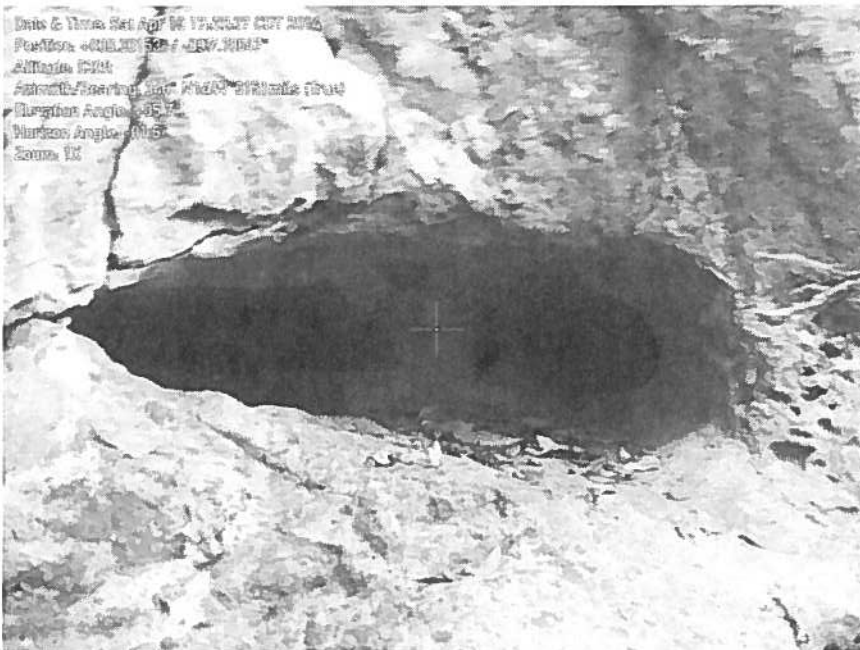


Photo 10
S-6

Solution cavity in vertical face of canyon rimrock (S-1).

Lat/Long in Decimal Degrees—WGS84:
North 30.30153 West -097.78647



Photo 11
Feature S-7 (solution cavity/seep)

Solution cavity in vertical face of canyon rimrock (S-1). Limestone knickpoint in creek bed.

Lat/Long in Decimal Degrees—WGS84:
North 30.30155 West -097.78676



Photo 12
Feature S-7 (solution cavity/seep)

Solution cavities (seepage points along limestone layers at knickpoints at head of canyon rimrock feature S-1). Formed along bedding plane seepage points in vertical face of canyon rimrock. Evidence of moisture and possible seepage following rain events, includes maidenhair fern and ivy.

Lat/Long in Decimal Degrees—WGS84:
North 30.30147 West -097.78651



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Site Photographs (page 5 of 5)
1.572025-acre property
Lakeshore Addition
Lots 15 & 16, part of Lot 14
2009 Island Way
Austin, Travis County, Texas
E1400014-EAHA

Photo 13

View facing southeast from the top of the rimrock feature (S-1).

Lat/Long in Decimal Degrees—WGS84.
 North 30.30102 West -097.78558



Photo 14

View facing east (toward Lake Austin) from the top of the canyon rimrock feature (S-1).

Lat/Long in Decimal Degrees—WGS84.
 North 30.30102 West -097.78558



Photo 15

View of rimrock feature S-2, southwest of the intersection of Lake Shore Drive and Island Way. This feature is formed by an exposed geologic fault scarp (Figure 4). The rimrock is only 42 feet long and does not meet the COA criteria to be considered protected rimrock. S-2 is in the location of a known fault that divides the Edwards from Upper Glen Rose Limestone (UT-BEG, 1981). This fault forms the boundary of the Edwards Aquifer Contributing and Recharge Zone.



Sound Science. Creative Solutions.

Austin Office
4407 Monterey Oaks Boulevard
Building 1, Suite 110
Austin, Texas 78749
Tel 512.476.0891 Fax 512.476.0893
www.swca.com

24 June 2013

RE: Site Environmental Investigation of 2009 Lakeshore Drive, Austin, Texas 78746

Mr. Aupperle,

Per your request, SWCA Environmental Consultants (SWCA) conducted a field investigation of the 2009 Lakeshore Drive tract in Austin, Texas for the purpose of gathering information for inclusion with the City of Austin environmental assessment documents you are preparing. An SWCA Registered Professional Geoscientist (Texas License # 10791) and an environmental specialist visited the site on 19 April 2013.

The site consists of an existing residential lot located within the Edwards Aquifer Contributing Zone, and while no bedrock outcrops were observed during the investigation, lithologies underlying the site consist of the Cretaceous Glen Rose Limestone and a blanket of Quaternary Lower Colorado River deposits¹. Additionally, the site is within the Lake Austin Watershed and the Colorado River Basin. Surface drainage from the site ultimately flows toward Lake Austin (Colorado River).

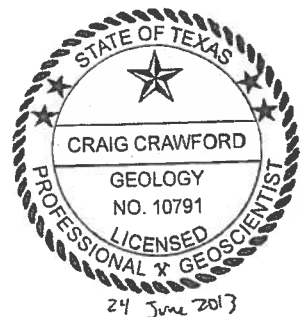
The City of Austin Land Development Code (LDC § 25-8-1) defines CEFs as "features that are of critical importance to the protection of environmental resources, and include bluffs, canyon rimrocks, caves, sinkholes and recharge features, springs, and wetlands." Please refer to the LDC for CEF definitions. It is my understanding that the lagoon area is to be filled in. No CEFs were identified during the field investigation in the vicinity of the lagoon. There are some rimrocks present on the tract (farther away and upslope from the lagoon/boat dock area), however these should not be affected by filling in the lagoon.

Please feel free to contact me at any time with any questions at (512) 476-0891.

Sincerely,

A handwritten signature in black ink that reads "Craig Crawford".

Craig Crawford, P.G.



¹ Garner, L.E., and Young, K.P., 1976, Environmental Geology of the Austin Area: An Aid to Urban Planning, Bureau of Economic Geology Report of Investigations No. 86, The University of Texas at Austin




Exhibit VI

City of Austin Site Review Critical Environmental Feature Worksheet

1	Project Name:	2009 Lakeshore Drive	5	Primary Contact Name:	Bruce Aupperle
2	Project Address:	2009 Lakeshore Drive	6	Phone Number:	(512) 422-7838
3	Date:	June 24, 2013	7	Prepared By:	Craig Crawford, P.G.
4	Environmental Assessment Date:	April 19, 2013	8	CEFS Located? (yes,no) :	Yes

[illegible]

City of Austin Use Only
WPDRD CASE NUMBER:

<p>For rimrock, locate the midpoint of the segment that describes the feature.</p> 	<p>For wetlands, locate the approximate centroid of the feature and the estimated area.</p> 	<p>For a spring or seep, locate the source of groundwater that feeds a pool or stream.</p> 
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PHOTOGRAPHIC LOG

2009 Lakeshore Drive Boat Dock/Shoreline Modification, Travis County, Texas

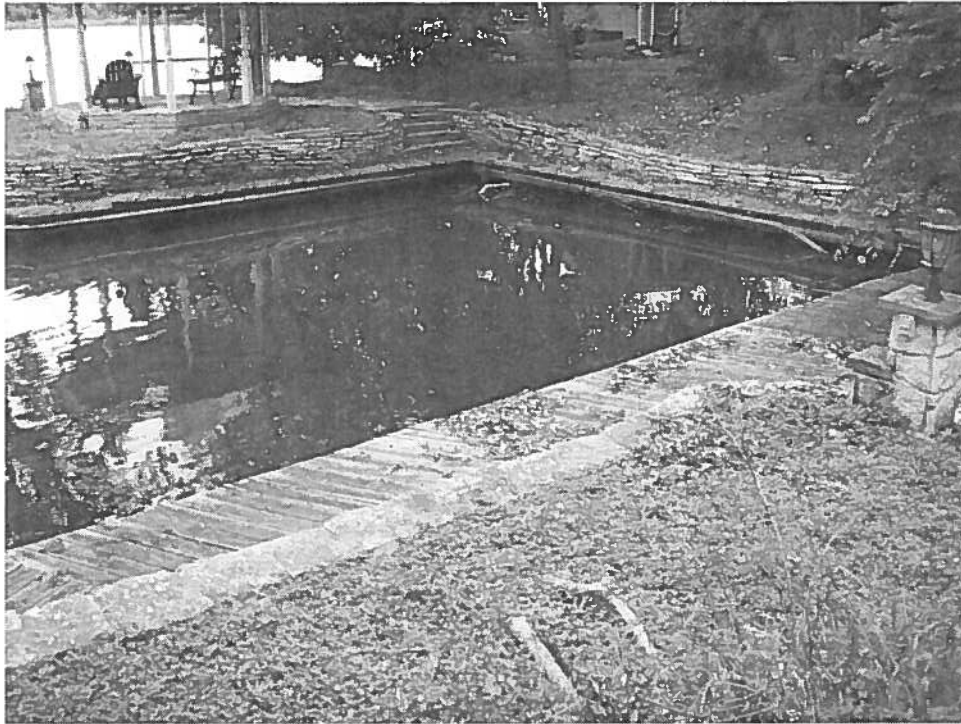


Photo 1.

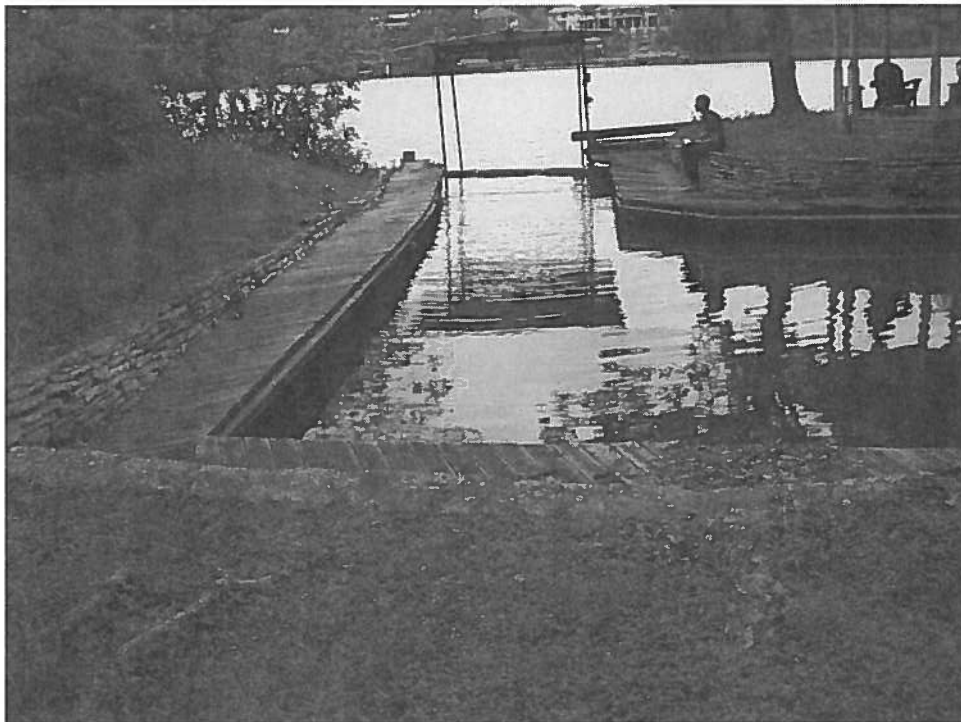


Photo 2.

SWCA Environmental Consultants

SWCA Project No. 26119

PHOTOGRAPHIC LOG

2009 Lakeshore Drive Boat Dock/Shoreline Modification, Travis County, Texas

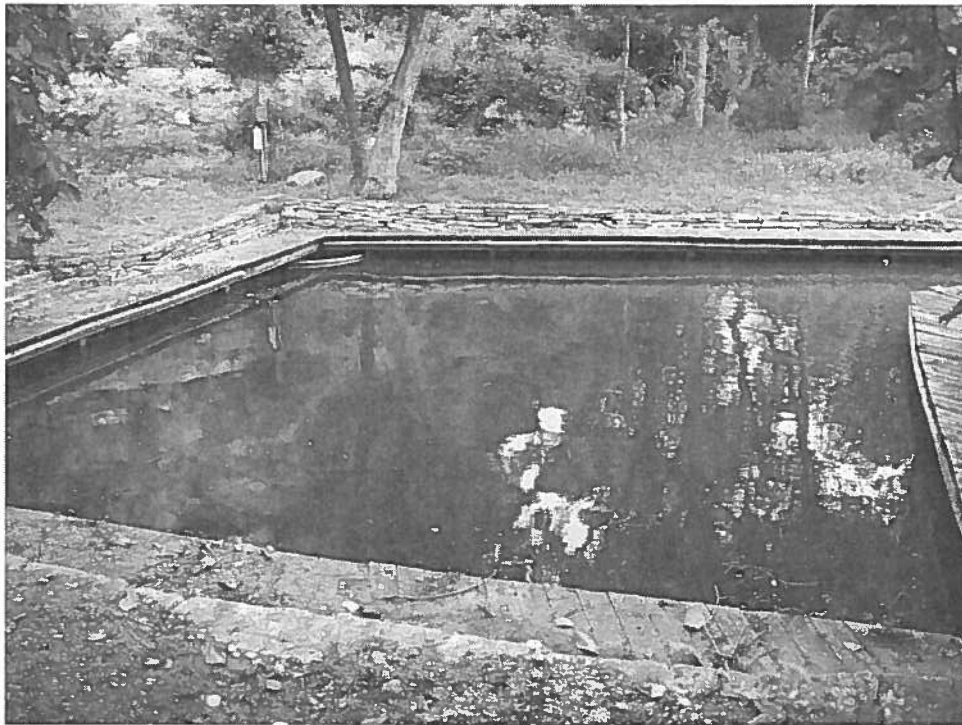


Photo 3.



Photo 4.

SWCA Environmental Consultants

SWCA Project No. 26119

2009 Lake Shore Drive

SP-2013-0504DS

2

Page 48

PHOTOGRAPHIC LOG

2009 Lakeshore Drive Boat Dock/Shoreline Modification, Travis County, Texas



Photo 5.