



ITEM FOR ENVIRONMENTAL COMMISSION AGENDA

MEETING DATE REQUESTED: December 16, 2015

NAME & NUMBER OF PROJECT: The Grove at Shoal Creek Planned Unit Development
C814-2015-0074

OWNER: ARG Bull Creek, LTD (Garrett Martin)

AGENT: Thrower Design (Ron Thrower)

LOCATION: 4205 Bull Creek Road

PROJECT FILING DATE: June 15, 2015

DSD/ENVIRONMENTAL STAFF: Jim Dymkowski, 974-2707
james.dymkowski@austintexas.gov

PZD/CASE MANAGER: Sherri Sirwaitis, 974-3057
sherri.sirwaitis@austintexas.gov

WATERSHED: Shoal Creek Watershed (Urban)
Desired Development Zone

ORDINANCE: Watershed Protection Ordinance (current Code)

REQUEST: Review and consider for recommendation the environmental aspects of the proposed Planned Unit Development (PUD), including code modifications and environmental superiority.

STAFF RECOMMENDATIONS: Postponement

REASONS FOR RECOMMENDATION: Significant aspects of the PUD, including base zoning and transportation, remain to be addressed so there is no staff recommendation on the PUD as a whole at this time.



MEMORANDUM

TO: Mary Gay Maxwell, Chair, and Members of the Environmental Commission

FROM: Jim Dymkowski, Environmental Review Specialist Senior
Development Services Department

DATE: October 29, 2015

SUBJECT: The Grove at Shoal Creek Planned Unit Development – C814-2015-0074

This summary is being provided to the Environmental Commission as a supplement to the Planning and Zoning Department analysis for The Grove at Shoal Creek Planned Unit Development (PUD). This memo provides an overview of the property's environmental features, the requested modifications to environmental code requirements, and the elements of the project that provide environmental superiority. Staff has requested that the project meet two conditions, as described on pages four and five. If the project meets the requested conditions, staff would find that the proposed development will be sufficiently environmentally superior to what could be built without the PUD.

Description of Property

The Grove at Shoal Creek PUD consists of an approximately 76 acre parcel of land in north-central Austin. It is located in the southeast corner of W. 45th Street and Bull Creek Road (see Attachment A – Location Map). Historically the land has been owned by the State of Texas and was not required to be platted or zoned.

The Grove at Shoal Creek PUD is located in the Shoal Creek Watershed. This watershed is classified as Urban and is within the Desired Development Zone. The PUD is not within the Edwards Aquifer recharge or contributing zones. A section of Shoal Creek flows north to south within and along the north half of the eastern perimeter of the PUD boundary. The PUD proposes the current code critical water quality zone buffer along this section of Shoal Creek (see Attachment B – Environmental Features Map).¹

¹ Per LDC Section 25-8-91, waterways within an Urban Watershed are not classified. However, per 25-8-92, a critical water quality zone is established along all waterways with a drainage area of at least 64 acres. The boundaries of the critical water quality zone coincide with the boundaries of the 100-year floodplain calculated under fully developed conditions provided that the boundary is not less than 50 feet and not more than 400 feet from the centerline of the waterway.

Existing Topography/Soil Characteristics/Vegetation

Approximately two thirds of the PUD site is currently undeveloped while the other third has existing development (TxDOT offices). The topography falls from west to east toward Shoal Creek, with elevations ranging from 670 to 570 feet above mean sea level. Slopes range between 0 and 15 percent on the majority of the property but increase to over 35 percent near Shoal Creek. The property has predominately clayey soils.

The woodland vegetation onsite includes live oak, pecan, cedar elm, cottonwood, mesquite, and sugarberry, with an understory of bluestem, tall dropseed, common ragweed, and Indian blanket. The wetland species include lance-leaf frog fruit, Texas rush, and seep muhly. The property contains a large number of heritage and protected trees, including 54 heritage live oaks, ten heritage pecans, two heritage cedar elms, and one heritage American elm. Significant groves of heritage and protected trees are located in the northeast corner of the property and in the center of the southern boundary adjacent to Bull Creek Road.

Critical Environmental Features/Endangered Species Habitat

An Environmental Resource Inventory (ERI) was prepared for the project site by Horizon Environmental Services in May 2015. The ERI identified one critical environmental feature (CEF) within the PUD site: an herbaceous wetland. The wetland CEF is required to be protected in accordance with LDC 25-8-282 (Wetland Protection). The PUD proposes to modify the standard 150-foot CEF setback and provide mitigation for the reduced setback in compliance with 25-8-282(B)(3). Proposed mitigation strategies include construction of a vegetated wetland fringe around the wet pond per requirements of the Environmental Criteria Manual (ECM) section 1.10.4(D)(3)(a), construction of a detention pond landscaped with a native wet prairie per ECM 1.10.4(D)(3)(b), which may support groundwater infiltration for the wetland, and provision of additional buffers per ECM 1.10.4(D)(3)(c) as a “grow-zone” along Shoal Creek.

The ERI also evaluated the property for suitable habitat for state and federally listed endangered, threatened, or candidate species. Neither listed species nor their critical habitat were observed on site during the field reconnaissance process.

Water/Wastewater

Water and wastewater service will be provided by the City of Austin. According to the 2015 ERI, the Texas Water Development Board Water Information Integration and Dissemination database reported one well within the property near the intersection of Bull Creek Road and W. 45th Street. The well is not currently used and the applicant has not indicated a desire to use this well for any of the proposed development. The ERI indicates that the well will be properly abandoned and the appropriate agencies notified of the abandonment.

Description of Project

The proposed project contains approximately 58 acres of mixed use development, including retail, office, multifamily, townhomes, and detached residential uses, and 17.75 acres of parks and open space.

Requested Environmental Code Modifications

The proposed PUD includes numerous modifications to current code requirements. The following summarizes key modifications to environmental requirements; please see the applicant's Exhibit E – Proposed Code Modifications for additional details.

- **25-8-641(B), Heritage Tree Removal Prohibited** – Eleven heritage trees identified on the applicant's Exhibit J – Tree Survey and Disposition Plan may be removed without an administrative or land use commission variance. The proposed code language is as follows:

“A permit to remove a heritage tree may be issued only if:

- (1) A variance is approved under Section 25-8-642 (Administrative Variance) or 25-8-643 (Land Use Commission Variance), or
- (2) the tree is indicated as “Trees That May Be Removed” on The Grove at Shoal Creek Tree Survey and Disposition Plan as attached to The Grove at Shoal Creek Planned Unit Development Ordinance No. _____. Sections 25-8-642 and 25-8-643 shall not apply to the trees indicated as “Trees That May Be Removed” on The Grove at Shoal Creek Tree Survey and Disposition Plan.

A permit issued under 25-8-642(A)(2) shall require mitigation at the rates prescribed on The Grove at Shoal Creek Tree Survey and Disposition Plan.”

The 11 heritage trees identified for removal include ten pecans and one American elm. Six of the ten pecans have been rated as “poor” by the project arborist, and their condition was confirmed by the City Arborist.

- **25-4-62, Expiration of Approved Preliminary Plan** – A preliminary plan would expire seven years after the approval date, instead of five years after the date the application is submitted as required by code.
- **25-4-102(A), Expiration of Subdivision Construction Plan** – A subdivision construction plan would expire seven years after the approval date, instead of three years after the approval date as required by code.
- **25-5-81(B) and (D), Site Plan Expiration** – A site plan would expire seven years after the approval date, instead of three years after the approval date as required by code.
- **25-5-21(B), Phased Site Plan** – The Development Services Director could approve development phasing if the date proposed for beginning construction on the final phase is not more than seven years after the approval date of the site plan, instead of three years after the approval date as required by code.

Proposed Environmental Superiority Elements

The project is proposing to provide the following environmental superiority elements (please see the applicant's Exhibit D – Tier 1 and Tier 2 Compliance Summary for additional details):

1. The PUD will provide at least 17.25 acres of open space, which is 58% higher than the 10.95 acres required based on the proposed land uses.

2. The PUD will exceed the minimum code requirements for landscaping. The project Design Guidelines will require minimum three-inch caliper street trees on all internal streets. Under conventional zoning, Tracts A, C, D, and E would be residential zoning districts and would not require street trees under Subchapter E. This area of additional street trees represents approximately 34 acres or 45 percent of the total project area. Street trees will also be required along Bull Creek Road, where they would not be required by Subchapter E. In addition, the Design Guidelines will require that a minimum of 95% of all non-turf plant materials be from or consistent with the City's Grow Green Guide. Finally, the project will provide an Integrated Pest Management Plan for all sites.
3. The PUD will provide superior water quality controls by using a wet pond and/or green water quality controls to treat a minimum of 50 percent of the required water quality volume. The wet pond will be designed so that potable makeup water will only be necessary under extreme drought conditions. A wet pond and green controls provide superior total suspended solids and nutrient removal compared to conventional treatment methods and also provide habitat and aesthetic benefits.
4. The project will provide that a minimum of ten acres of impervious cover will drain to and be substantially treated by green water quality controls that infiltrate or reuse water on or near the site of the impervious cover, such as rain gardens, biofiltration facilities, and rainwater harvesting.
5. The project will not modify the existing 100-year floodplain.
6. The project will preserve a minimum of 75 percent of all protected size native caliper inches, as well as prepare a tree care plan for all preserved heritage and protected trees on site. The project will also provide increased mitigation rates for the removal of heritage trees: a mitigation rate of 100 percent will be provided for heritage trees in poor condition, which would not typically require any mitigation under current code.
7. The project will cluster development along Bull Creek Road and the interior of the property and away from environmentally sensitive areas like Shoal Creek and the large oak groves.
8. The project will direct stormwater runoff from impervious surfaces to a landscaped area at least equal to the total required landscape area.
9. The project will provide flood detention for the existing 9.4 acres of currently undetained impervious cover on the site.
10. The project will provide educational signage at the wetland CEF.

Recommendations

As proposed, staff finds that the environmental superiority elements do not outweigh the environmental impacts of the requested code modifications. The proposal is not environmentally superior because the project is not sufficiently protective of the heritage and protected trees on the property. Heritage and protected native trees are a significant environmental feature of this property. The project is requesting the ability to remove 11 heritage trees, which have the highest level of protection provided by the City's code. The proposed superiority elements ensure preservation of at least 75 percent of all native protected tree caliper inches, and provide for a

tree care plan and mitigation rates that exceed code requirements. However, the proposed superiority elements do not fully compensate for the request to remove the heritage trees.

To achieve environmental superiority, the staff has requested that the project be required to exceed code requirements to protect the most significant trees on the property, which are the grove of live oaks in the vicinity of the proposed wet pond. Staff requested that the project agree to protect the three-quarter critical root zone of all heritage and protected trees near the proposed wet pond. Protecting the trees around the wet pond from construction impacts is important not only because those are some of the most significant trees on the property, but because they will be public trees within the signature park. Public heritage and protected oaks provide significant community benefits and should be afforded the highest level of protection from potential construction impacts.

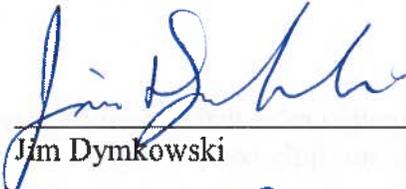
Please note that in the applicant's Tier I and II tables there is a request for four code modifications that would extend the expiration date of future development approvals. Since the submittal of those documents for inclusion in the Environmental Commission backup the applicant has agreed to remove those requests. The reference to those code modifications is included below for completeness.

In conclusion, staff has requested the following conditions:

1. Wet pond construction and any other construction in the immediate vicinity of the wet pond shall avoid any impacts within the three-quarter critical root zone of all nearby heritage and protected trees; and
2. The proposed code modifications to sections 25-4-62, 25-4-102(A), 25-5-81(B) and (D), and 25-5-21(B) shall be eliminated and the project shall comply with current code regarding preliminary plan, subdivision construction plan, and site plan expirations and site plan phasing.

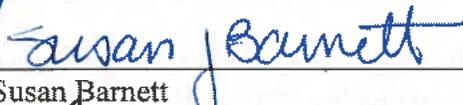
If the project meets the requested conditions, staff would find that the proposed development will be environmentally superior to what could be built without the PUD.

Environmental Reviewer:



Jim Dymkowski

Manager, Environmental Review:



Susan Barnett

Environmental Officer:



Chuck Lesniak

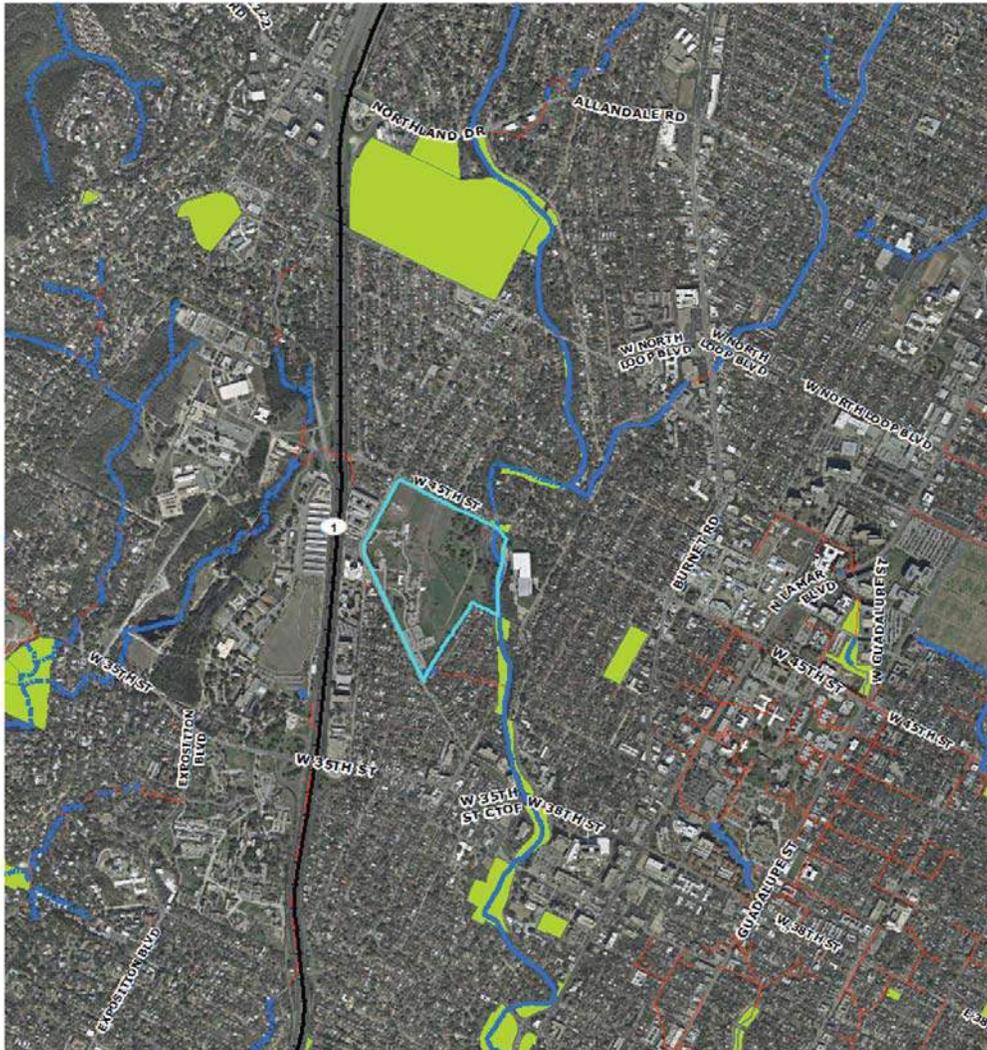
Date:

October 29, 2015

Attachments

- A Location Map
- B Environmental Features Map
- C Site Photos
- D Driving Directions
- E Applicant's Environmental Resource Inventory

Attachment A
The Grove at Shoal Creek Location Map



PUD Boundary



City of Austin Park and Open Space

Attachment C
The Grove at Shoal Creek PUD Site Photos



View of PUD property from Bull Creek Road, southeast corner looking north into site



View of PUD property from Bull Creek Rd. and 45th St. looking southeast into site



Large grove of live oaks near existing development on Bull Creek Road



Large grove of live oaks near NE corner of PUD boundary and Shoal Creek, where proposed wet pond would be located



Wetland Critical Environmental Feature (CEF)



View of Shoal Creek from 45th St. bridge looking south. The PUD site is on the right.

Attachment D

Driving Directions to The Grove at Shoal Creek PUD

From Austin City Hall, 301 W. 2nd Street:

- Head east on 2nd St. to Lavaca St.; turn left and go 0.7 miles
- Turn left on W. 12th St.; go 0.6 miles
- Turn right onto N. Lamar Blvd.; go 1.6 miles
- Turn left onto 29th St.; go 0.5 miles
- Turn right onto Jefferson St.; go 0.6 miles
- Turn left onto Bull Creek Rd.; go 0.5 miles. Destination will be on right.

Environmental Resource Inventory

For the City of Austin
Related to LDC 25-8-121, City Code 30-5-121, ECM 1.3.0 & 1.10.0

The ERI is required for projects that meet one or more of the criteria listed in LDC 25-8-121(A), City Code 30-5-121(A).

1. SITE/PROJECT NAME: The Grove at Shoal Creek
2. COUNTY APPRAISAL DISTRICT PROPERTY ID (#'s): 122169
3. ADDRESS/LOCATION OF PROJECT: 4205-4305 Bull Creek Road
4. WATERSHED: Shoal Creek - Urban
5. THIS SITE IS WITHIN THE *(Check all that apply)*
 - Edwards Aquifer Recharge Zone* *(See note below)* YES No
 - Edwards Aquifer Contributing Zone* YES No
 - Edwards Aquifer 1500 ft Verification Zone* YES No
 - Barton Spring Zone* YES No

**(as defined by the City of Austin – LDC 25-8-2 or City Code 30-5-2)*

Note: If the property is over the Edwards Aquifer Recharge zone, the Hydrogeologic Report and karst surveys must be completed and signed by a Professional Geoscientist Licensed in the State of Texas.

6. DOES THIS PROJECT PROPOSE FLOODPLAIN MODIFICATION?..... YES** NO
If yes, then check all that apply:
 - (1) The floodplain modifications proposed are necessary to protect the public health and safety;
 - (2) The floodplain modifications proposed would provide a significant, demonstrable environmental benefit, as determined by a **functional assessment** of floodplain health as prescribed by the Environmental Criteria Manual (ECM), or
 - (3) The floodplain modifications proposed are necessary for development allowed in the critical water **quality zone under LDC 25-8-261 or 25-8-262, City Code 30-5-261 or 30-5-262.**
 - (4) The floodplain modifications proposed are outside of the Critical Water Quality Zone in an area determined to be in poor or fair condition by a **functional assessment** of floodplain health.

**** If yes, then a functional assessment must be completed and attached to the ERI (see ECM 1.7 and Appendix X for forms and guidance) unless conditions 1 or 3 above apply.**

7. IF THE SITE IS WITHIN AN URBAN OR SUBURBAN WATERSHED, DOES THIS PROJECT PROPOSE A UTILITY LINE PARALLEL TO AND WITHIN THE CRITICAL WATER QUALITY ZONE? YES*** NO

*****If yes, then riparian restoration is required by LDC 25-8-261(E) or City Code 30-5-261(E) and a functional assessment must be completed and attached to the ERI (see ECM1.5 and Appendix X for forms and guidance).**

8. There is a total of 1 (#s) Critical Environmental Feature(s)(CEFs) on or within 150 feet of the project site. If CEF(s) are present, attach a detailed **DESCRIPTION** of the CEF(s), color **PHOTOGRAPHS**, the **CEF WORKSHEET** and provide **DESCRIPTIONS** of the proposed CEF buffer(s) and/or wetland mitigation. Provide the number of each type of CEFs on or within 150 feet of the site *(Please provide the number of CEFs):*

_____ (#'s) Spring(s)/Seep(s) _____ (#'s) Point Recharge Feature(s) _____ (#'s) Bluff(s)
 _____ (#'s) Canyon Rimrock(s) 1 (#'s) Wetland(s)

Note: Standard buffers for CEFs are 150 feet, with a maximum of 300 feet for point recharge features. Except for wetlands, if the standard buffer is not provided, you must provide a written request for an administrative variance from LDC 25-8-281(C)(1) and provide written findings of fact to support your request. Request forms for administrative variances from requirements stated in LDC 25-8-281 are available from Watershed Protection Department.

9. The following site maps are attached at the end of this report (Check all that apply and provide):

All ERI reports must include:

- Site Specific Geologic Map with 2-ft Topography**
- Historic Aerial Photo of the Site**
- Site Soil Map**
- Critical Environmental Features and Well Location Map on current Aerial Photo with 2-ft Topography**

Only if present on site (Maps can be combined):

- Edwards Aquifer Recharge Zone with the 1500-ft Verification Zone**
(Only if site is over or within 1500 feet the recharge zone)
- Edwards Aquifer Contributing Zone**
- Water Quality Transition Zone (WQTZ)**
- Critical Water Quality Zone (CWQZ)**
- City of Austin Fully Developed Floodplains for all water courses with up to 64-acres of drainage**

10. **HYDROGEOLOGIC REPORT** – Provide a description of site soils, topography, and site specific geology below (Attach additional sheets if needed):

Surface Soils on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups*. If there is more than one soil unit on the project site, show each soil unit on the site soils map.

Soil Series Unit Names, Infiltration Characteristics & Thickness		
Soil Series Unit Name & Subgroup**	Group*	Thickness (feet)
Eddy soils and Urban land, 0 to 6% slopes (EuC)	D	1.6
Oakalla soils, 0 to 1% slopes, channeled, frequently flood(Fs)	B	6.6
Houston Black soils and Urban land, 0 to 8% slop(HsD)	D	6.6
Urban land and Austin soils, 0 to 5% slopes (UsC)	C	4.3
Urban land, Austin, and Whitewright soils, 1 to 8%(UtD)	C	4.3

*Soil Hydrologic Groups Definitions (Abbreviated)
A. Soils having a <u>high infiltration</u> rate when thoroughly wetted.
B. Soils having a <u>moderate infiltration</u> rate when thoroughly wetted.
C. Soils having a <u>slow infiltration</u> rate when thoroughly wetted.
D. Soils having a <u>very slow infiltration</u> rate when thoroughly wetted.
**Subgroup Classification – See <u>Classification of Soil Series</u> Table in County Soil Survey.

Description of Site Topography and Drainage *(Attach additional sheets if needed):*

Topographically, the site ranges from approximately 570 to 670 feet above mean sea level (USGS, 1988). Drainage on the subject site occurs primarily by overland sheet flow in a west to east direction into Shoal Creek.

List surface geologic units below:

Geologic Units Exposed at Surface		
Group	Formation	Member
Eagle Ford		--
Washita	Buda Limestone	--
Washita	Del Rio Clay	--
		--

Brief description of site geology *(Attach additional sheets if needed):*

Eagle Ford Group, Kef, Buda Limestone, Kbu, and in structurally complicated areas, Eagle Ford Group and Buda Limestone undivided, Keb (UT-BEG, 1995).

Eagle Ford Group, Kef, shale and limestone. Upper part shale, compact, silty, contains fossil fish teeth and bones, 10 feet or more thick; middle part silty limestone grading to calcareous siltstone, flaggy, medium-gray, weathers pale yellowish-brown, 5 feet thick. Lower part shale, calcareous, dark gray, 7-50 feet thick. Thickness of Eagle Ford Group 25-65 feet.

Buda Limestone, Kbu, fine-grained, bioclastic, commonly glauconitic, pyritiferous, hard, massive, poorly bedded to nodular, thinner bedded and argillaceous near upper contact, light gray to pale orange; weathers dark gray to brown; burrows filled with chalky marl, abundant pelecypods; thickness up to 45 feet, locally absent to north.

The site geology is continued in Environmental Resources Inventory Attachments.

Wells – Identify all recorded and unrecorded wells on site (test holes, monitoring, water, oil, unplugged, capped and/or abandoned wells, etc.):

There are 1 (#) wells present on the project site and the locations are shown and labeled

 (#s)The wells are not in use and have been properly abandoned.

 1 (#s)The wells are not in use and will be properly abandoned.

 (#s)The wells are in use and comply with 16 TAC Chapter 76.

There are 0 (#s) wells that are off-site and within 150 feet of this site.

11. **THE VEGETATION REPORT** – Provide the information requested below:

Brief description of site plant communities (*Attach additional sheets if needed*):

The subject site exhibited a combination of woodland, grassland/prairie/savanna, and hydrophytic plant species, detailed below.

There is woodland community on siteYES NO (*Check one*).

If yes, list the dominant species below:

Woodland species	
Common Name	Scientific Name
post oak	Quercus stellata
mesquite	Prosopis glandulosa
pecan	Carya illinoensis
sugarberry	Celtis laevigata

There is grassland/prairie/savanna on site.....YES NO (*Check one*).

If yes, list the dominant species below:

Grassland/prairie/savanna species	
Common Name	Scientific Name
big bluestem	Andropogon gerardi
tall dropseed	Sporobolus compositus
silver bluestem	Bothriochloa saccharoides
common ragweed	Ambrosia artemisiifolia
Indian blanket	Gaillardia pulchella

There is hydrophytic vegetation on siteYES NO (*Check one*).

If yes, list the dominant species in table below (*next page*):

Hydrophytic plant species		
Common Name	Scientific Name	Wetland Indicator Status
lance-leaf frog fruit	Phyla lanceolata	FACW
Texas rush	Juncus texanus	OBL
seep muhly	Muhlenbergia reverchonii	FAC

A tree survey of all trees with a diameter of at least eight inches measured four and one-half feet above natural grade level has been completed on the site.

YES NO (Check one).

12. WASTEWATER REPORT – Provide the information requested below.

Wastewater for the site will be treated by (Check of that Apply):

- On-site system(s)
- City of Austin Centralized sewage collection system
- Other Centralized collection system

Note: All sites that receive water or wastewater service from the Austin Water Utility must comply with City Code Chapter 15-12 and wells must be registered with the City of Austin

The site sewage collection system is designed and will be constructed to in accordance to all State, County and City standard specifications.

YES NO (Check one).

Calculations of the size of the drainfield or wastewater irrigation area(s) are attached at the end of this report or shown on the site plan.

YES NO Not Applicable (Check one).

Wastewater lines are proposed within the Critical Water Quality Zone?

YES NO (Check one). If yes, then provide justification below:

Is the project site is over the Edwards Aquifer?

YES NO (Check one).

If yes, then describe the wastewater disposal systems proposed for the site, its treatment level and effects on receiving watercourses or the Edwards Aquifer.

Wasterwater will be connected to the City of Austin's collection system.

13. One (1) hard copy and one (1) electronic copy of the completed assessment have been provided.

Date(s) ERI Field Assessment was performed: 2/18/15 and 5/15/15
Date(s)

My signature certifies that to the best of my knowledge, the responses on this form accurately reflect all information requested.

James Killian

512-328-2430

Print Name

Telephone

James P. Killian

jkilian@horizon-esi.com

Signature

Email Address

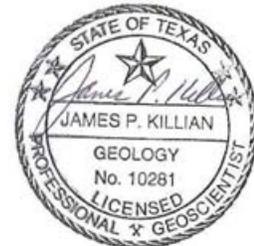
Horizon Environmental Services, Inc.

10/27/15

Name of Company

Date

For project sites within the Edwards Aquifer Recharge Zone, my signature and seal also certifies that I am a licensed Professional Geoscientist in the State of Texas as defined by ECM 1.12.3(A).



ENVIRONMENTAL RESOURCE INVENTORY ATTACHMENTS

**THE GROVE AT SHOAL CREEK
BULL CREEK ROAD
HJN 140259 ERI**

DATA RESOURCES USED IN COMPLETING THIS ERI

- (COA) City of Austin. *GIS Data Sets*, Year 2012 2-foot contours of the City of Austin and ETJ only, <ftp://ftp.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html>. Updated by City of Austin 2012.
- _____. *GIS Data Sets*, Recharge Zone, Contributing Zone, and Edwards Contributing Zone 1500' Buffer, <ftp://ftp.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html>. Updated by City of Austin 2015.
- _____. *GIS Data Sets*, Water Quality Creek Buffers, <ftp://ftp.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html>. Updated by City of Austin 2015.
- Gould, F.W. *Texas Plants – A Checklist and Ecological Summary*. College Station: Texas A&M University. 1975.
- (NRCS) Natural Resources Conservation Service (formerly Soil Conservation Service), US Department of Agriculture. Web Soil Survey, <<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>>. Accessed 18 May 2015.
- (TWDB) Texas Water Development Board. Water Information Integration and Dissemination System. TWDB Groundwater Database (ArcIMS), <http://wiid.twdb.state.tx.us/ims/wwm_drl/viewer.htm?>>. Accessed 18 May 2015.
- (USDA) US Department of Agriculture. National Agriculture Imagery Program, Farm Service Agency, Aerial Photography Field Office. Travis County, Texas. 1995 and 2014.
- (USGS) US Geological Survey. 7.5-minute series topographic maps, Austin West, Texas, quadrangle, 1988.
- (UT-BEG) University of Texas Bureau of Economic Geology, C.V. Proctor, Jr., T.E. Brown, J.H. McGowen, N.B. Waechter, and V.E. Barnes. *Geologic Atlas of Texas*, Austin Sheet, Francis Luther Whitney Memorial Edition. 1974; reprinted 1995.

**ERI WORKSHEET SECTION 5:
EDWARDS AQUIFER RECHARGE ZONE**

Karst Survey



Environmental Services, Inc.

27 October 2015

Steve Walkup
MileStone Community Builders
9111 Jollyville Road, Suite 111
Austin, Texas 78759

**RE: Hydrogeologic Report and Karst Survey Results – The Grove at Shoal Creek,
located at 4205-4305 Bull Creek Road, Austin, Travis County, Texas
HJN 140259 ERI**

Dear Mr. Walkup:

As requested, Horizon Environmental Services, Inc. (Horizon) performed a City of Austin (COA) Environmental Resource Inventory (ERI) per Land Development Code (LDC) Section 25-8, Title 30-5 for the above-referenced site. If the subject site is located over the Edwards Aquifer Recharge Zone, the COA requires a hydrogeologic report and karst survey be completed and signed by a Professional Geoscientist (PG) licensed in the State of Texas. This letter addresses those requirements set forth by the COA for a hydrogeologic report and karst survey of the subject site.

HYDROGEOLOGIC REPORT AND KARST SURVEY

According to COA LDC 25-8-122, a hydrogeologic report must: (1) generally describe the topography, soils, and geology of the site; (2) identify springs and significant point recharge features on the site; (3) demonstrate that proposed drainage patterns will protect the quality and quantity of recharge at significant point recharge features; and (4) identify all recorded and unrecorded water wells, both on the site and within 150 feet of the boundary of the site.

The objective of a karst survey is to identify any surface karst features (e.g., caves, sinkholes, faults, joint fractures, springs, etc.) that may indicate the presence of any subsurface voids with suitable habitat for federally listed endangered cave invertebrates and/or that provide point recharge to the Edwards Aquifer. The subject site has a very small narrow portion located along the western boundary within the Edwards Aquifer Recharge Zone. However, Mr. Scott Hiers, PG with the COA has informed Horizon that this narrow area of recharge zone does not occur within the subject site and is incorrectly mapped. 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 into the aquifer through permeable features such as cracks, fissures, caves, and other openings (TCEQ, 1999).

The subject site is mapped on the US Geological Survey (USGS) Austin West, Texas, topographic quadrangle (USGS, 1988) and is within the Shoal Creek watershed (COA, 2012). Topographically, the site ranges from approximately 570 to 670 feet above mean sea level (USGS, 1988). Drainage on the subject site occurs primarily by overland sheet flow in a west-to-east direction into Shoal Creek.

CORPORATE HEADQUARTERS

1507 South IH 35 ★ Austin, Texas 78741 ★ 512.328.2430 ★ Fax 512.328.1804 ★ www.horizon-esi.com
Certified WBE/HUB/DBE/SBE

According to the Natural Resources Conservation Service (NRCS), mapped soils on the subject site include the following:

**TABLE 1
SOILS**

SOIL NAME	SOIL TYPE	SOIL DEPTH (FEET)	UNDERLYING MATERIAL	PERMEABILITY	AVAILABLE WATER CAPACITY	SHRINK-SWELL CAPACITY
Eddy soils and Urban land, 0 to 6% slopes (EuC)	gravelly loam or gravelly clay loam	0.5 to 1.5	weakly cemented chalk	moderately slow	low	low
Houston Black soils and Urban land, 0 to 8% slopes (HsD)	clay or gravelly clay	4 to 6	mottled clay	very slow	high	high
Oakalla soils, 0 to 1% slopes, channeled, frequently flooded (Fs)	silty clay loam	4 to 6	chalk	moderate	high	low
Urban land and Austin soils, 0 to 5% slopes (UsC)	silty clay	2 to 4	partly weathered chalk	moderately slow	low	moderate to high
Urban land, Austin, and Whitewright soils, 1 to 8% (UtD)	silty clay or clay loam	2 to 4	soft limestone	moderately slow	low	moderate to high

Source: Werchan and Coker, 1974; NRCS, 2015

A review of existing literature shows the subject property is predominately underlain by the Eagle Ford Group and Buda Limestone undivided (Keb) (UT-BEG, 1995). The Eagle Ford Group is a massive, calcareous, and gray to dark gray shale with thin interbeds of silty and sandy, flaggy limestone. It has a maximum thickness of up to 45 feet and is not known to yield water in Travis County. The Buda Limestone is massive, light gray to pale orange, fine grained, hard, poorly bedded to nodular, and fossiliferous with burrows filled with chalky marl. The upper portion is harder and bluff forming. It has an estimated maximum thickness of up to 50 feet and is not known to yield water in Travis County. Underlying the Eagle Ford Group and Buda Limestone undivided is the Del Rio Clay with a thickness ranging from 40 to 70 feet. In general, the rock strata beneath the site dip gently to the east-southeast at about 40 to 50 feet per mile (less than 1°). Additionally, the subject property is not located within the Balcones Fault Zone, and available geologic reports indicate that the immediate area has not been affected by geologic inactive faulting. The nearest fault is located about 300 feet due west of the site, trending southwest to northeast along Loop 1.

A search was made for water wells on and within 150 feet of the boundary of the subject site. A review of the records of the Texas Water Development Board (TWDB) revealed 1 unused water well (No. 5842622 – Texas State Cemetery) located at the far northwestern corner of the site near the intersection of Bull Creek Road and 45th Street (TWDB, 2015). This well is reportedly completed in the Edwards Aquifer with a pump set at approximately 395 feet below the surface and a total depth of 504 feet (TWDB, 2015). The results of this survey do not preclude the existence of an abandoned well. Abandoned wells 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. A plugging report must

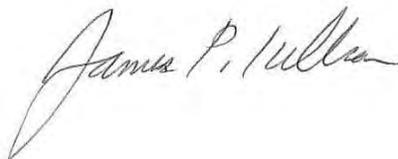
be submitted (by a licensed water well driller) to the Texas Department of Licensing and Regulation, Water Well Driller's Program, Austin, Texas. If a well is intended for use, it must comply with 16 TAC §76.

The karst survey was conducted on 18 May 2015 by Horizon support staff under the supervision of senior geologist James Killian, PG, who is currently permitted by the US Fish and Wildlife Service (USFWS) to sample and collect federally listed karst invertebrate species within Bexar, Travis, and Williamson counties, Texas, for scientific and species recovery purposes. The karst feature survey was conducted in general accordance with USFWS protocols. The ground survey was performed by walking parallel transects within the subject site and evaluating any surface expression that might indicate subsurface karst development. The survey included a review of available, existing information on previously documented regional caves that contain federally protected species, topography and geology of the subject site and vicinity, a pedestrian ground survey to identify surface expressions of karst features, and the description and assessment of features, if present. Mapping by George Veni and Associates (2002) indicates most of the subject site is located within Karst Zone 4, which is defined as areas that do not contain endangered cave fauna. Along lower elevations near Shoal Creek, the subject site is located within Karst Zone 3, which is defined as areas that probably do not contain endangered cave fauna.

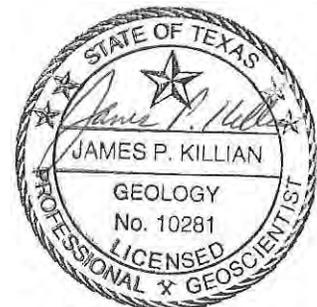
Following the collection and review of background information, Horizon conducted a ground survey of the subject site to locate and describe karst features that could provide suitable habitat for endangered cave invertebrate species and/or provide point recharge to the Edwards Aquifer. While conducting the survey, field personnel evaluated any outcropping limestone, surface depressions, or other factors that may indicate subsurface karst development. Based on the results of the ground survey, no potential karst features were found at the subject site.

Based upon identified geologic information, a low to moderate potential exists that subsurface voids may be encountered during any proposed construction within the immediate project area that would involve subsurface excavation. If such voids are encountered, excavation should stop immediately, and a qualified karst geologist should be contacted to perform an inspection/evaluation of the voids. Please contact me or Mr. Shannon Dorsey at 512.328.2430 if you have any questions or require additional information.

Sincerely,



James Killian, PG¹
Senior Geologist – Horizon



¹ Registered Professional Geologist, State of Texas

REFERENCES

- (COA) City of Austin. *City of Austin GIS Data Sets. Watersheds*. <ftp://ftp.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html>. 26 July 2012.
- (NRCS) Natural Resources Conservation Service (formerly Soil Conservation Service), US Department of Agriculture. Web Soil Survey, <<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>>. Accessed 26 May 2015.
- (TCEQ) Texas Commission on Environmental Quality. *Complying with the Edwards Aquifer Rules: Administrative Guidance*, revised August 1999.
- (TWDB) Texas Water Development Board. Water Information Integration and Dissemination System. <<http://wiid.twdb.state.tx.us/>>. Accessed 26 May 2015.
- (USGS) US Geological Survey. 7.5-minute series topographic maps, Austin West, Texas, quadrangle, 1988.
- (UT-BEG) The University of Texas at Austin Bureau of Economic Geology; C.V. Proctor, Jr., T.E. Brown, J.H. McGowen, N.B. Waechter, and V.E. Barnes. *Geologic Atlas of Texas, Austin Sheet*. Francis Luther Whitney Memorial Edition. 1974; revised 1995.
- Veni, George, and Associates. *Delineation of hydrogeologic areas and zones for the management and recovery of endangered karst invertebrate species in Bexar County, Texas*. Report for the US Fish and Wildlife Service, Austin, Texas, George Veni and Associates, San Antonio, Texas, 75 pp. 2002.
- Werchan, Leroy E., A.C. Lowther, and Robert N. Ramsey. *Soil Survey of Travis County, Texas*. US Department of Agriculture, Natural Resources Conservation Service (formerly Soil Conservation Service), in cooperation with the Texas Agricultural Experiment Station. 1974.

**ERI WORKSHEET SECTION 8:
CRITICAL ENVIRONMENTAL FEATURES**

CEF Descriptions
Descriptions of Proposed Buffers
Color Photographs

Critical Environmental Features

CEFS observed on or within 150 feet from the subject site include:

Springs/Seeps: _____
Point Recharge Features: _____
Bluffs: _____
Canyon Rimrocks: _____
Wetlands: 1

1 CEF, as defined by the City of Austin, was found on or within 150 feet from the subject site. The CEF wetland (W 1) consisted of hydrophytic vegetation and surface water (0-3 inches). The wetland was located on a side slope adjacent to Shoal Creek. The CEF wetland dimensions and locations are provided on the City of Austin CEF worksheet and photographs are attached.

Proposed Buffers

If the subject site is proposed for future development, the City of Austin generally requires that 150-foot buffer zones be placed on all CEFs.



PHOTO 1
General view of area located above the Edwards Aquifer Recharge Zone.



PHOTO 2
Typical view of the subject site.



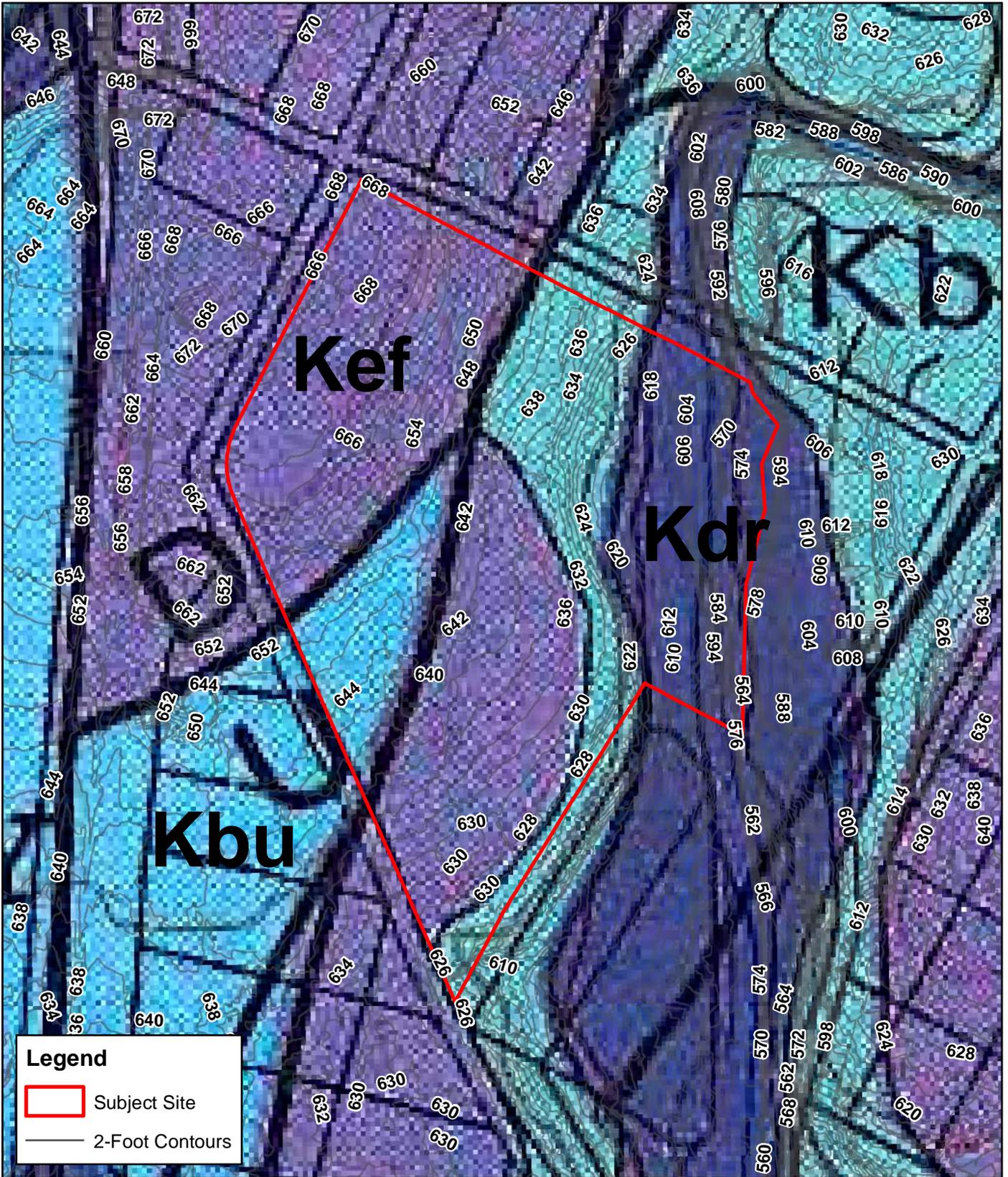
PHOTO 3
View of Shoal Creek.



PHOTO 4
View of CEF wetland W 1.

**ERI WORKSHEET SECTION 9:
SITE MAPS**

- Figure 1. Site-Specific Geologic Map
- Figure 2. Historical Aerial Photo
- Figure 3. Site Soil Map
- Figure 4. Critical Environmental Features and Well Locations
- Figure 5. Edwards Aquifer Recharge Zone with 1500-foot Verification Zone
- Figure 6. Critical Water Quality Zone (CWQZ)
- Figure 7. City of Austin Fully Developed Floodplains



MAP SOURCE: UT-BEG, 1992; COA, 2012; USDA, 2014.

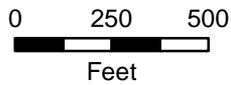


FIGURE 1

SITE SPECIFIC GEOLOGIC MAP
APPROXIMATELY 76-ACRE
THE GROVE AT SHOAL CREEK
AUSTIN, TRAVIS COUNTY, TEXAS



Legend

 Subject Site

MAP SOURCE: USDA, 1995.

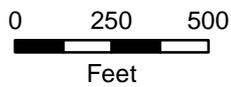
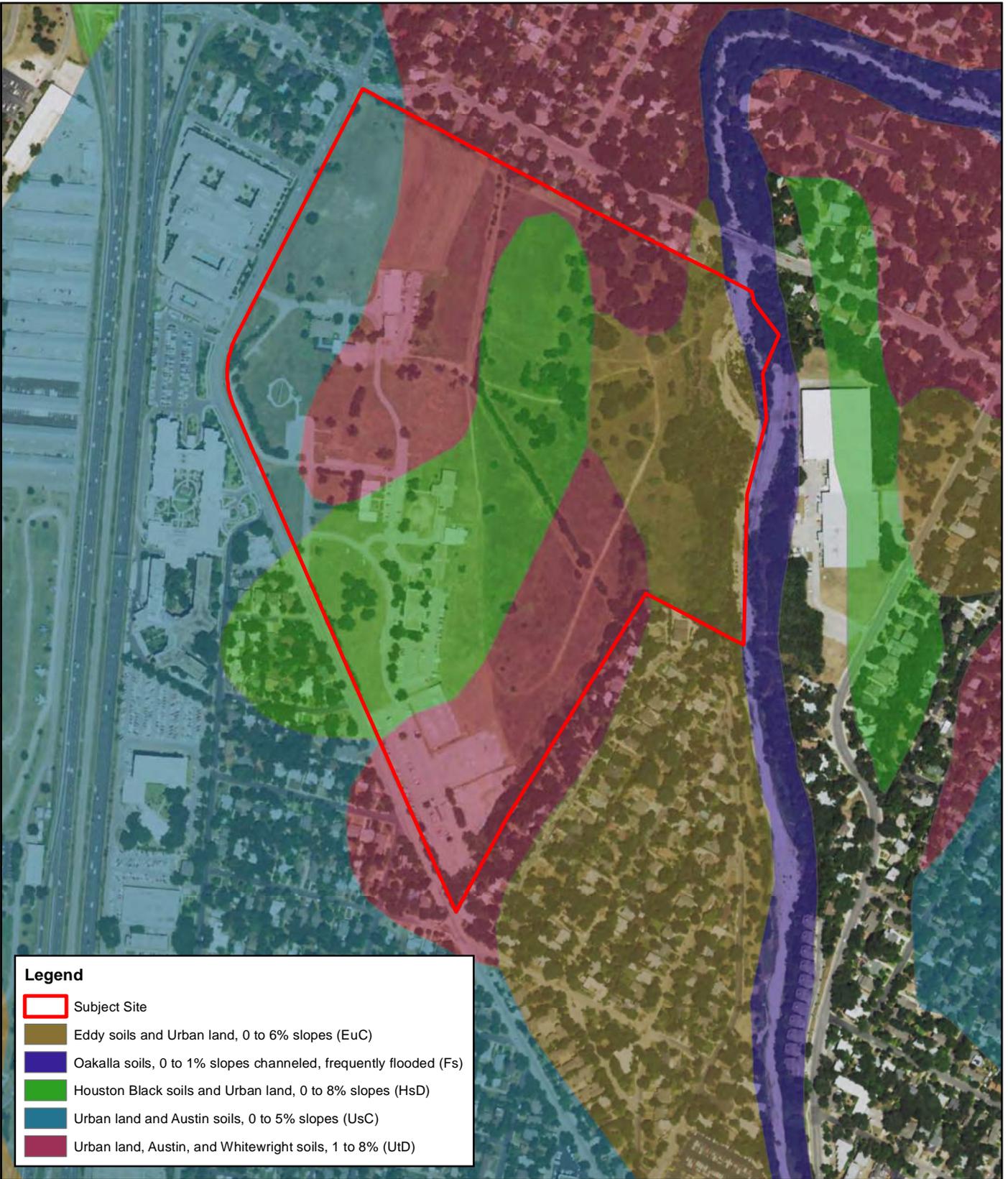


FIGURE 2

HISTORICAL AERIAL PHOTO
APPROXIMATELY 76-ACRE
THE GROVE AT SHOAL CREEK
AUSTIN, TRAVIS COUNTY, TEXAS



Legend

- Subject Site
- Eddy soils and Urban land, 0 to 6% slopes (EuC)
- Oakalla soils, 0 to 1% slopes channeled, frequently flooded (Fs)
- Houston Black soils and Urban land, 0 to 8% slopes (HsD)
- Urban land and Austin soils, 0 to 5% slopes (UsC)
- Urban land, Austin, and Whitewright soils, 1 to 8% (UTD)

MAP SOURCE: USDA, 2014; NRCS, 2015.

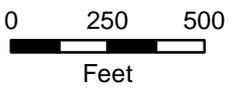


FIGURE 3

SITE SOIL MAP
APPROXIMATELY 76-ACRE
THE GROVE AT SHOAL CREEK
AUSTIN, TRAVIS COUNTY, TEXAS

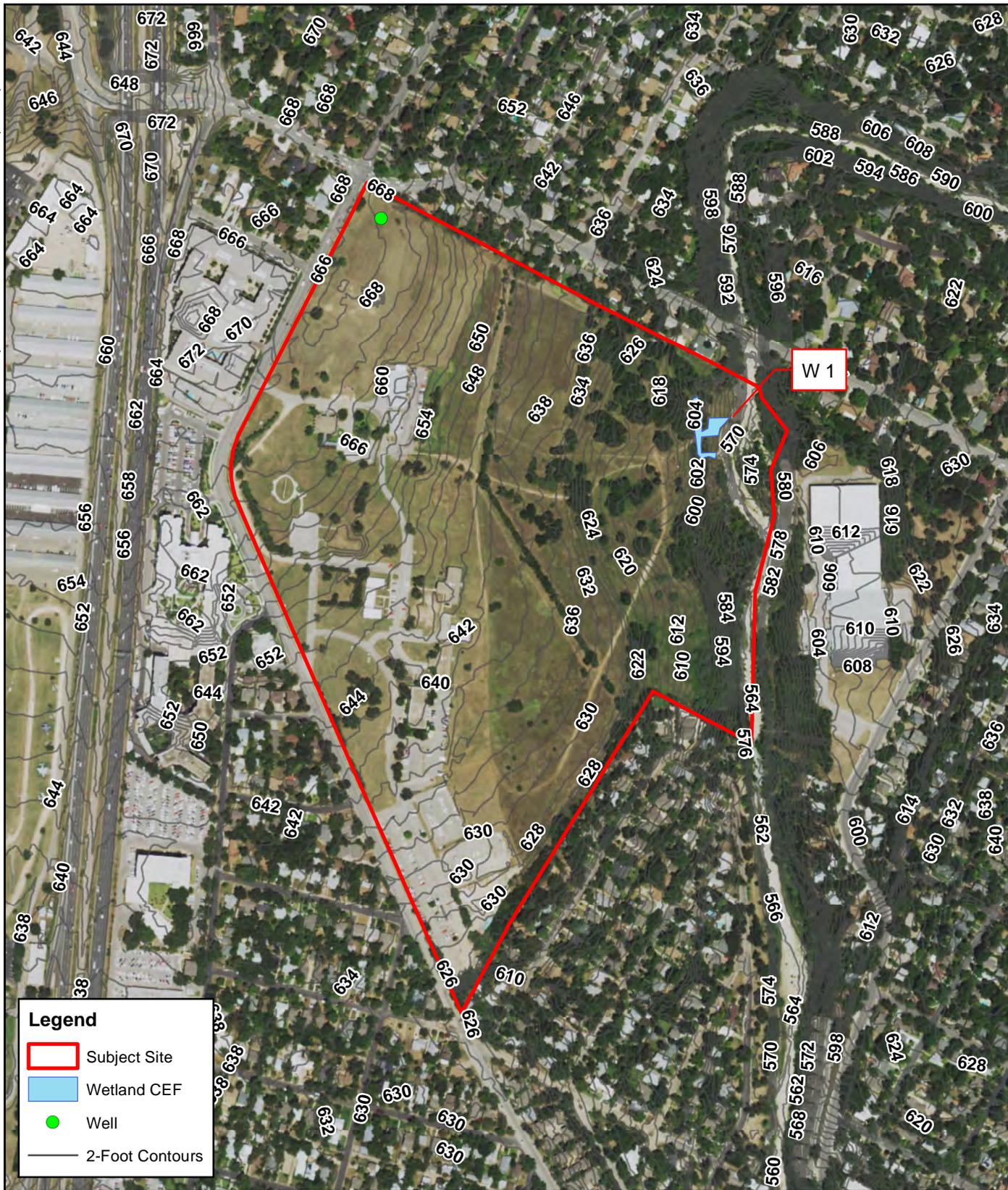
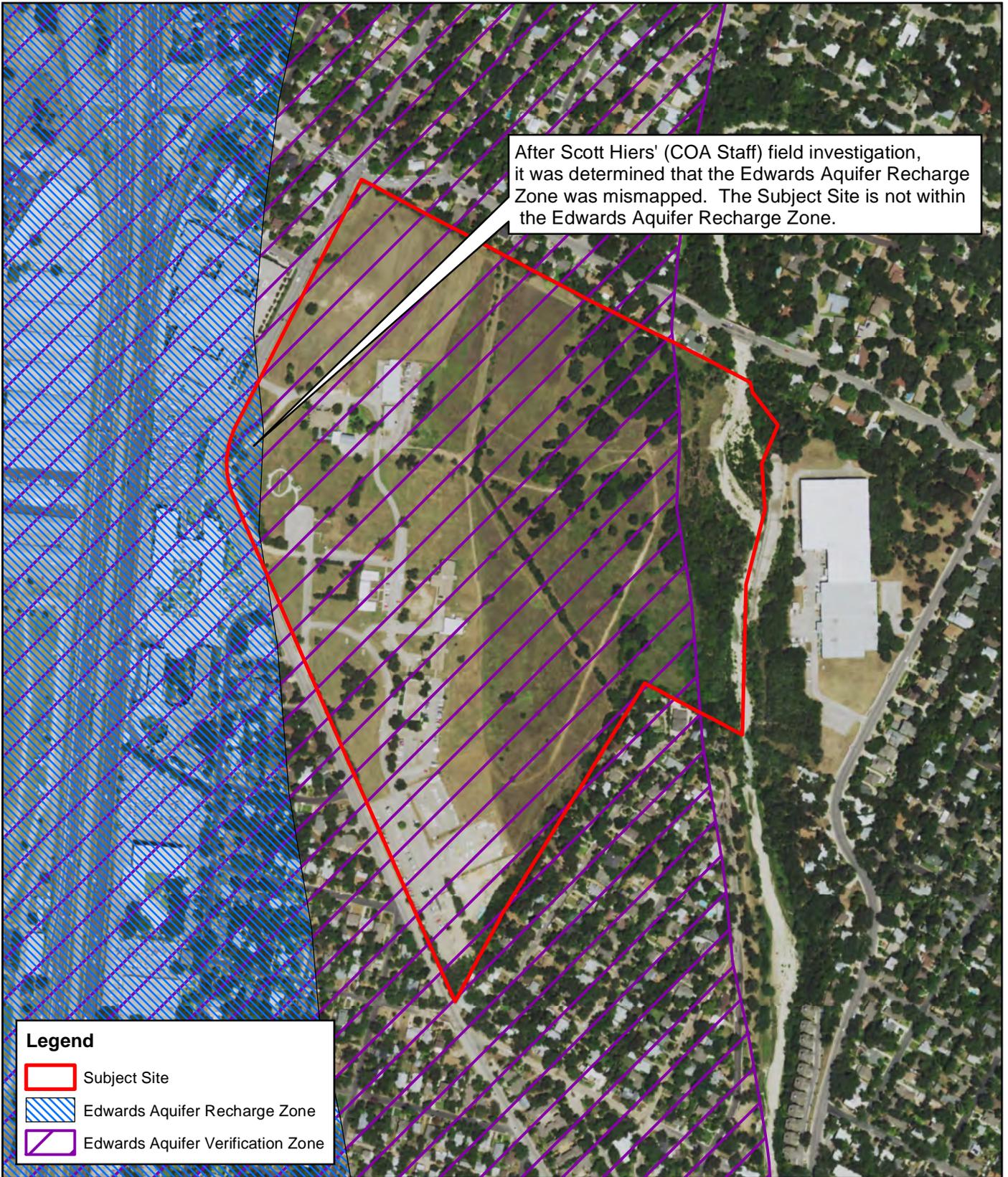


FIGURE 4

CRITICAL ENVIRONMENTAL FEATURES
AND WELL LOCATIONS MAP
APPROXIMATELY 76-ACRE
THE GROVE AT SHOAL CREEK
AUSTIN, TRAVIS COUNTY, TEXAS



Legend

- Subject Site
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Verification Zone

MAP SOURCE: COA, 2015; USDA, 2014.

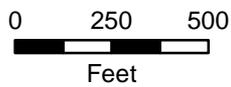


FIGURE 5

EDWARDS AQUIFER RECHARGE ZONE WITH VERIFICATION ZONE MAP APPROXIMATELY 76-ACRE THE GROVE AT SHOAL CREEK AUSTIN, TRAVIS COUNTY, TEXAS



MAP SOURCE: COA, 2015; USDA, 2014.

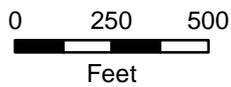


FIGURE 6

CRITICAL WATER QUALITY ZONE MAP
APPROXIMATELY 76-ACRE
THE GROVE AT SHOAL CREEK
AUSTIN, TRAVIS COUNTY, TEXAS



MAP SOURCE: COA, 2015; USDA, 2014.

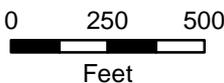


FIGURE 7

CITY OF AUSTIN FULLY DEVELOPED FLOODPLAIN FOR ALL WATER COURSES WITH UP TO 64-ACRES OF DRAINAGE MAP APPROXIMATELY 76-ACRE THE GROVE AT SHOAL CREEK AUSTIN, TRAVIS COUNTY, TEXAS

**ERI WORKSHEET SECTION 10:
HYDROGEOLOGIC REPORT ADDITIONAL DATA**

SECTION 10 ADDITIONAL DATA

Brief description of site geology, continued from ERI worksheet, Section 10:

Del Rio Clay ("Grayson Marl"), Kdr, Georgetown Formation, Kgt, and in structurally complicated areas, Del Rio clay ("Grayson Marl") and Georgetown Formation undivided, Kdg.

Del Rio Clay ("Grayson Marl"), Kdr, calcareous and gypsiferous, becoming less calcareous and more gypsiferous upward, pyrite common, blocky, medium gray, weathers light gray to yellowish gray; some thin lenticular beds of highly calcareous siltstone: marine megafossils include abundant *Exogyra arietina* and other pelecypods; thickness 40-70 feet.