



MEMORANDUM

To: Mayor and Council Members

From: Greg Meszaros, Director, Austin Water

Date: March 9, 2020

Subject: **Final Response to Resolution 20190606-048 Regarding William H. Russell Karst Preserve Cave Restoration and Water Quality Management**

On June 6, 2019 the Austin City Council approved a resolution directing the City Manager to initiate proceedings under City Code Section 14-1-39 renaming the Blowing Sink Research Management Area to the William H. Russell Karst Preserve, to develop a land management plan for the tract, to prepare a report on existing cave and karst feature projects and programs and a memorandum of understanding between relevant departments addressing process improvements for cave restoration and water quality monitoring for caves on City-owned land.

Renaming of the Blowing Sink Research Management Area

The Parks and Recreation Department has completed the administrative renaming process. All files and records are current and reflect the renaming of the parcel to the William H. Russell Karst Preserve.

Land Management Plan Update: Completed February 2020

City staff from Austin Water's Wildland Conservation Division (WCD), Parks and Recreation Department (PARD), and Watershed Protection Department (WPD) completed a draft Land Management Plan for the William H. Russell Karst Preserve in October 2019. The final land management plan was completed in February 2020 and is attached. The land management plan addresses management goals to continue the legacy of Bill H. Russell's work to further explore, document and protect the City's karst resources with the assistance of knowledgeable stakeholders in the community. The land management plan documents the history of the tract, management goals, key deed provisions, critical environmental features, wildfire preparedness, existing infrastructure, site security, public access and further process or policy needs. The land management plan also addresses recommendations for water quality monitoring, permitted



research, guided public access, and best practices for engaging knowledgeable stakeholders in the community.

Report on Existing Cave and Karst Feature Projects: DRAFT Completed January 2020

Staff in WCD, WPD, and PARD have completed a draft Story Map for the website highlighting important cave and karst restoration projects in an engaging way for the public. You can explore more [here](#).

Memorandum of Understanding (MOU): Completed March 2020

Staff have completed an MOU between relevant departments to address cave restoration and maintenance on City-owned land that outlines proposed process improvements and regulatory considerations.

Should you have any questions or would like any additional information please contact me at 512-972-0108 or greg.meszaros@austintexas.gov.

cc: Spencer Cronk, City Manager
Kimberly McNeely, Director, Parks and Recreation Department
Jorge Morales, Director, Watershed Protection Department
Denise Lucas, Director, Development Services Department
Sherri Kuhl, Division Manager Wildland Conservation, Austin Water

Attachment: Link to draft Cave Restoration Story Map
Memorandum of Understanding (MOU) WPD, AW, PARD, DSD - Cave Restoration
Final Land Management Plan



Response to Council Resolution No. 20190606-048.

**MEMORANDUM OF UNDERSTANDING
BETWEEN
THE CITY OF AUSTIN
AUSTIN WATER, DEVELOPMENT SERVICES, PARK AND RECREATION,
AND
WATERSHED PROTECTION DEPARTMENTS**

The purpose of this Memorandum of Understanding (MOU) is to establish clear processes for the permitting of cave restoration activities such as debris removal, vegetation management, monitoring, and construction of gates, fences, access roads or other appurtenances for the maintenance or improvement of protected caves on City of Austin property. This MOU follows from City Council Resolution No. 20190606-048, which directs:

"The City Manager is directed to develop a Memorandum of Understanding between Austin Water (AW), Development Services (DSD), Parks and Recreation (PARC), and Watershed (WPD) Departments to address cave restoration and water quality monitoring related to caves on City-owned land."

This City of Austin Interdepartmental Agreement is effective when the last party signs (the "Effective Date").

The "Parties" (known as AW, DSD, PARC, and WPD) agree as follows:

AGREEMENT

Each of the Parties plays a role in the restoration and protection of caves on City of Austin property. Austin Water and Watershed Protection sponsor projects that: remove debris to improve recharge to groundwater aquifers, to restore natural cave ecosystems, and to provide educational opportunities to the public; Development Services and Watershed Protection (via Environmental Officer and the Environmental Resources Management Division) create and administer the rules governing construction and land development activities near Critical Environmental Features (CEF) within the City limits and ETJ; Parks and Recreation, Watershed Protection, and Austin Water manage public lands containing caves that were purchased specifically for their ecosystem preservation and recharge potential.

The following is a clarification of certain definitions, roles and responsibilities and courses of action for staff to follow when implementing cave restoration or monitoring activities.

- I. For purposes of Cave Management/Restoration activities, Maintenance is defined as: "Site activities that improve or restore recharge or habitat by physically removing organic debris (e.g. leaves, wood, rocks, sediment) and trash with a plan for haul and disposal or re-use in preserve restoration. Activities performed must: 1) use non-mechanized equipment (per ECM 1.10); 2) not create new impervious cover (e.g. new access roads, concrete slabs, or impermeable construction covering the natural land surface); 3) occur within the footprint of the existing feature (i.e. no excavation of previously undisturbed parent material)." Maintenance activities shall be consistent with guidelines in ECM 1.10.5.
- II. Maintenance activities do not require a permit and require no notification.

- III. Activities that do not meet the definition of maintenance may be considered development and, if within the buffer zone of a Critical Environmental Feature (CEF), are considered construction per LDC 25-8-281 and may require an administrative variance per 25-8-42. See also ECM 1.10.4 for guidance relating to administrative variance criteria.
- IV. Cave restoration activities that are considered development/construction may be provided an administrative variance reviewed and granted by WPD Environmental Resource Management staff. Such a determination should be processed through the appropriate DSD permit staff.
- V. A project may be considered for a Site Plan Exemption per LDC 25-5-2, although an administrative variance approved by WPD Environmental Resource Management may still be required. Otherwise it will need to submit for a permit.

IN WITNESS WHEREOF, WPD, AW, PARD, and DSD have executed this Agreement to be effective on April 1, 2020.

Approved as to Content:



 Jorge Morales, P.E., Director
 Watershed Protection Department

February 26, 2020
 Date



 Greg Meszaros, Director
 Austin Water

3/3/20
 Date



 Kimberly McNeeley, Director
 Parks and Recreation Department

3-3-20
 Date



 Denise Lucas, Director
 Development Services Department

3/3/2020
 Date

City of Austin

William H. Russell Karst Preserve Land Management Plan



"Lower Eileen's River"

February 2020

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BACKGROUND SUMMARY

The William H. Russell Karst Preserve is a City of Austin preserve that has been informally co-managed by the City of Austin's Parks and Recreation Department Nature Preserves (PARD), Watershed Protection Department (WPD), and Austin Water's Balcones Canyonland Preserve (AW BCP). The tract contains Blowing Sink Cave, one of the 62 permit caves that the City of Austin and Travis County are required to protect under the U.S. Fish and Wildlife Service (USFWS) Balcones Canyonland Conservation Plan (BCCP) for the preservation of rare karst invertebrates (USFWS #PRT-788841). The site is also important for the preservation of the Barton Springs salamander (*Eurycea sosorum*) which is listed as endangered and has been documented in the cave. This 191-acre tract was chosen for its outstanding quality and quantity of surface recharge, and the majority of it (165 acres) was established in 2000 as mitigation land for the Forum PUD. The preserve has a very high density of large, internal drainage sinkholes. In its natural state, over 72% of the surface area of this site is contained within an internal drainage basin that does not provide surface runoff for local creeks, but instead directly recharges the Edwards Aquifer.

On June 6, 2019, Austin City Council renamed Blowing Sink Research Management Area to William H. Russell Karst Preserve under Resolution No. 20190606-048 to honor William "Bill" H. Russell who explored and mapped the caves on the preserve. The William H. Russell Karst Preserve has not been open to the public except through permitted access and staff-escorted tours.

This document serves as a formal land management agreement and includes a summary of the site, goals, and objectives, and details a timeline for implementation including roles and responsibilities.

SITE SUMMARY

- William H. Russell Karst Preserve
- Size 190.65 acres
- Landowner and authority
 - City of Austin, Dedicated Parkland
- Managing entities
 - Austin Parks and Recreation Natural Resources Division, Nature Preserves
 - Austin Water Balcones Canyonland Preserve Program
- Stated legal purpose for land
 - 165.27 acres north of Austin Energy Electric Transmission easement including in the William H. Russell Karst Preserve was donated to the City of Austin on February 18, 2000, as part of City of Austin Zoning Ordinance No. 990408-14. (Appendix A1 Deed)
 - 25.65 acres south of the Austin Energy Electric Transmission easement including in the William H. Russell Karst Preserve was sold to the City of Austin for \$10.00 on March 21, 2014 by Circle C group, LLC. (Appendix A2 Deed)

GOALS AND OBJECTIVES

Goals and objectives for this site are drawn from the deeds, BCCP guiding documents BCP Land Management Plans, and City Council Resolution No. 20190606-048, discussed below.

GOAL 1. Protect listed species and species of concern.

- Protect surface plant and animal communities.
- Maintain nutrient input.
- Protect cave's surface and subsurface drainage basins.
- Manage public access.
- Control invasive species.
- Restore other caves on the preserve to create wildlife habitat to expand the permit cave and its accessible habitat.
- Continue wildlife management operations that contribute to a healthy ecosystem.

GOAL 2. Retain forever as natural and open space.

- Continue management with the City of Austin.
- Establish clear secure boundaries.
- Implement wildfire protection measures.

GOAL 3. Maintain and improve hydrological process and land health.

- Restore other caves on the preserve to increase recharge and connect Blowing Sink Cave to other caves on the preserve.
- Continue to explore the site for other filled caves that have not yet been discovered.
- Provide for the conservation, maintenance, and enhancement of water flowing into the Barton Springs Segment of the Edwards Aquifer.
- Protect against contamination.

GOAL 4. Provide for passive recreation and outdoor education.

- Provide educational opportunities on the site.

DIRECTIVES

The 1996 Balcones Canyonlands Conservation Plan (BCCP) establishes karst preserves and defines them as important caves and cave clusters distributed over the extent of potential karst habitat, based on a strategy to protect the federally-listed cave invertebrates as well as a longer list of rare and local species that may be listed in the future. To be considered protected, a karst fauna area must contain a large enough expanse of continuous karst and surface area to maintain the integrity of the karst ecosystem on which each species depends. In most instances, this will entail protecting the entire surface and sub-surface drainage area of each cave and enough of the surface vegetation community to support small animals and buffer against red imported fire ant infestations (USFWS, 1996).

BCCP permit holders are required to “acquire and manage or implement formal management agreements...adequate to preserve the environmental integrity of ...Blowing Sink Cave”. (USFWS #PRT-788841 Clause P No Surprises Section Listed Karst Species of Concern Sub-Section 1 p.8). The entire preserve provides direct runoff and/or infiltration to Blowing Sink Cave and is considered within its surface and subsurface catchment areas. The Karst Species Management Chapter of the Land Management Plan (BCP 2016) outlines specific management required to meet permit compliance and is the basis for the William H. Russell Karst Preserve land management plan.

The deeds for both the 165.27 acre portion north of the electric and communication transmission easement and 25.65 acres portion to the south are attached in the appendices. The 2000 deed states, “The Property is conveyed exclusively as parkland for preservation purposes, and to provide passive recreation and outdoor education for the people of the Central Texas area concerning the nature, wildlife, and ecosystems of Central Texas.” The deeds for the north 165-acre property also provides specific directions for conveyance purpose that are summarized in abbreviated form below:

1. Provide for passive recreation and outdoor education;
2. Retain forever as natural and open space;
3. Maintain and improve hydrological process and land health;
4. Allow for wildlife management operations that contribute to hydrological processes;
5. Provide for the conservation, maintenance and enhancement of water flowing into the Barton Springs Segment of the Edwards Aquifer;
6. Prevent any use that will impair conservation values by
 - Pollution avoidance;
 - Watershed protection;
 - Preservation and enhancement of baseflow or recharge.

The deed describes prohibited uses, except as reasonably necessary for appropriate management of the property as a nature preserve:

1. No Surface Alteration;
2. No Soil or Water Degradation;
3. No Cutting;
4. No Biocides;
5. No Dumping;
6. No Storage Tanks;
7. Water Use. There shall be no pollution, alteration, manipulation, depletion, or extraction.
8. Construction. There shall be no placement or construction of structures.

SITE HISTORY

Prior to being designated as a preserve, the site was an active ranch and was subject to overgrazing for many years. Ranchers commonly plugged sinkholes with clay to create stock ponds for livestock, prevent livestock from falling in cave shafts, and for trash disposal. Erosion by livestock and driving unimproved access roads may also have led to filling of low-lying sinkholes. Notably, a portion of the cave fill could potentially be fairly ancient and contain important historical resources. Carbon dating of soil removed from a 12-foot-deep sinkhole over the Main Pit of Blowing Sink Cave indicated the sediment was deposited from about 1,685 years ago to about 12,000 years ago.

Figure 1. BLOWING SINK TRACT 1995 BEFORE OWNERSHIP TRANSFERRED TO THE CITY



Blowing Sink Cave was discovered by cave explorers William H. “Bill” Russell and Nancy Weaver in April 1984 as a 10-inch-wide hole in a sink depression that blew air. Within a month of exploration with other cavers, the Main Pit was reached. By February of 1990 Bill Russell and Julie Jenkins dug through horizontal crawls to reach the water table at Egyptian Junction. The Forum PUD development acquired the Blowing Sink tract and donated it to the City as mitigation for building a higher density development (now called Arbor Trails) at William Cannon and Mopac South (Appendix A1). The Barton Springs/Edwards Aquifer Conservation District had advised the developer that the Blowing Sink tract was the most sensitive site not currently part of a preserve. The site was not being considered for acquisition under the Proposition 2 bonds for sensitive land acquisition. In 2000 Austin City Council

voted to accept the Blowing Sink tract as a preserve with the City of Austin Parks and Recreation Department. This officially created the Blowing Sink Research Management Area.

In 2010, improvement of plugged sinks on Blowing Sink Research Management Area was offered as partial mitigation for the adjacent Davis Lane realignment project. Tracing studies conducted for that project during the BCCP Infrastructure Habitat Mitigation Assessment process determined the project was within the subsurface catchment area for Blowing Sink Cave. However, findings from Dr. Hauwert's (2012) evaluations indicated that the proposed alterations to existing infrastructure and alterations to project designs would serve to reduce adverse impacts to protected caves to levels below pre-BCCP conditions. From 2013 to 2016, a roughly \$700,000 Capital Improvement Project partially unplugged and stabilized five large sinkholes on the William H. Russell Karst Preserve.

A timeline of significant events and restoration efforts are presented in Appendix B.

Figure 2. MAP OF WILLIAM H. RUSSELL KARST PRESERVE



FEATURES

The William H. Russell Karst Preserve falls under the conservation land use classification used by the City of Austin. The vegetation type is live oak- Ashe juniper woodlands. The vegetation on the site is within the BCCP Golden-cheeked Warbler Zone 2 Habitat Mitigation Fee Zone which means that the existing size, canopy cover, and species composition is potential habitat for the endangered warbler, but no Golden-cheeked Warblers have been confirmed at the site. Vegetation maintenance in this mitigation fee zone has seasonal restrictions and is limited to the non-nesting season from September 1st to February 28th.

KARST

The tract contains Blowing Sink Cave, one of the longest and deepest of the BCCP caves, as well as nine other sinkholes and caves that recharge the Barton Springs Segment of the Edwards Aquifer. Direct tracing has shown that infiltration across the entire preserve potentially drains into Blowing Sink Cave. Cave Maps are included in Appendix C.

The known karst features of the William H. Russell Karst Preserve include:

- Blowing Sink
- Sinky Dinky
- Winter Woods
- Wyoaka
- Sunspot
- Sunspot Annex
- William Well Caves (Sink in the Woods)
- Jody Lane
- Flat Sink
- Brownlee Cave

Surface runoff flows into large sinkholes on the tract including Brownlee, Wyoaka, Sinky Dinky, Sink in the Woods (Williams Well Cave), Winter Woods, Flat Sink, Sunspot, and Blowing Sink Cave (the terminal sink) where it recharges the Edwards Aquifer. Runoff from the remaining portion of the tract (about 28% of the preserve area) in its current condition enters a cave (Brodie Cave) in a creek channel one mile downstream that usually captures all creek runoff. Groundwater tracers injected within a mile of the William H. Russell Karst Preserve have arrived at Barton Springs within 30 hours to 3 days. Blowing Sink Cave is unique in that access to the water table has been reached (Eileen's River). The subsurface catchment area for drips in Blowing Sink Cave and Eileen's River cave stream have been traced to extend at least 3,000 feet north to the Goat Cave Karst Nature Preserve across Davis Lane, and at least one mile west to Wildflower Cave near Loop 1.

A few years after the City of Austin acquisition of the site, cattle were removed and Blowing Sink Cave was gated on September 19, 2003. In an effort to safely access the lower levels of Blowing Sink Cave to monitor the Barton Springs salamanders, an effort was initiated in December 2004 to install a reinforced concrete shaft which was completed in 2009. In 1991, Bill Russell built wooden shoring and gates at Sinky Dinky, Sink in the Woods, and Brownlee caves. While the wooden shoring was a temporary solution to address the immediate problems that volunteer cavers observed, the structures were not designed as a permanent solution to transmit floodwaters into the subsurface. Over time, sediment made its way past the wood cribbing, and erosion took its toll on the soil surrounding the wood shoring. The wooden chimneys were left standing as towers within sinks as the soil was carried into the aquifer with stormwater. Improvement of plugged sinks on Blowing Sink Research Management Area was offered as partial mitigation for the adjacent Davis Lane realignment project.

The 2013-2016 Capital Improvement Project allowed for the excavation of five collapsing and plugged cave entrances (Sinky Dinky, Winter Woods, Sink-in-the-Woods/Williams Well, Wyoaka, and Brownlee caves) enabling stormwater to naturally recharge. Revegetation watered from a water well is reestablishing tree canopies and providing a vital source of nutrients for cave crickets. Rutted access roads that diverted flow away from natural cave destinations were restored using sediment excavated from the caves. While the caves were extensively hand excavated using cave-trained staff, considerable

fill sediment remains in the five caves. Regular maintenance of the known karst features and other caves that are present, in the form of sediment removal, will be required to sustain cave ecosystems nutrient input and preserve natural recharge.

In October 2013, before sinkhole restoration commenced, runoff from a large storm left Blowing Sink Cave obstructed with large rocks. The cave stream and the lower half of Blowing Sink Cave are inaccessible. There is no space to store the boulders within the cave and they cannot physically be removed as there is a 200-foot long crawl to the primary entrance of the cave. On November 14, 2015, cave radio locations for either side of the Main Pit in Blowing Sink Cave were located on the surface. On August 4, 2017, AW BCP submitted a General Permit notification form and in October 2017, the General Permit office acknowledged that the proposed project was exempt as a maintenance activity and approved its execution. In January 2018, a 13-foot deep filled sinkhole was excavated using hand-held tools, including a jackhammer, by contractors Charlie Savvas and John Clark, two of the original explorers of Blowing Sink Cave that first reached the lower levels in 1988.

Figure 3. MAPPED SUBSURFACE CAVE EXTENTS RELATIVE TO BLOWING SINK CAVE

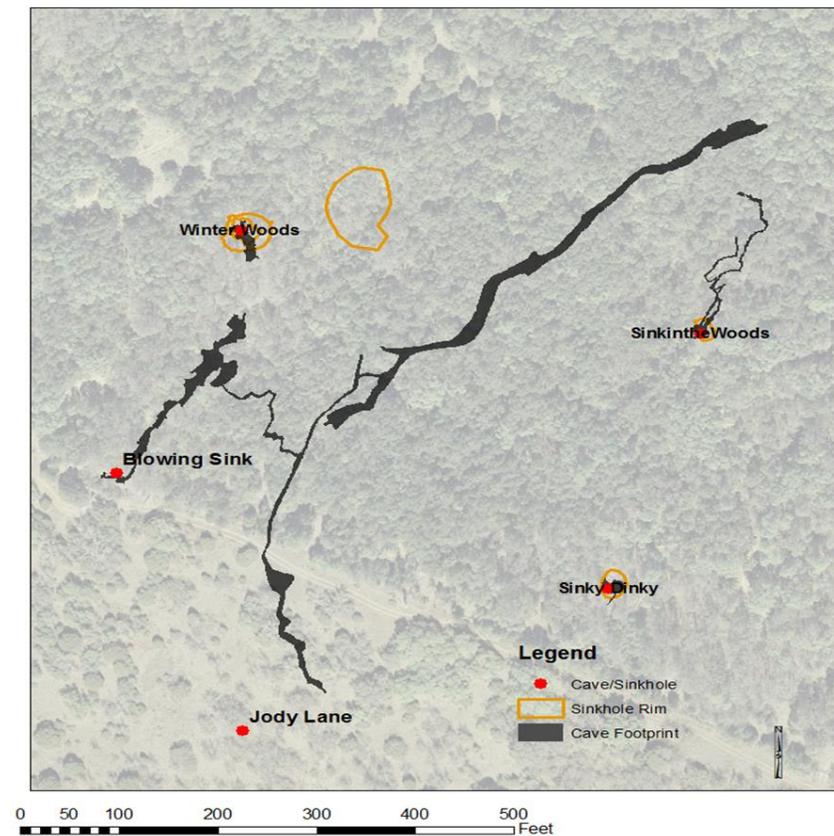
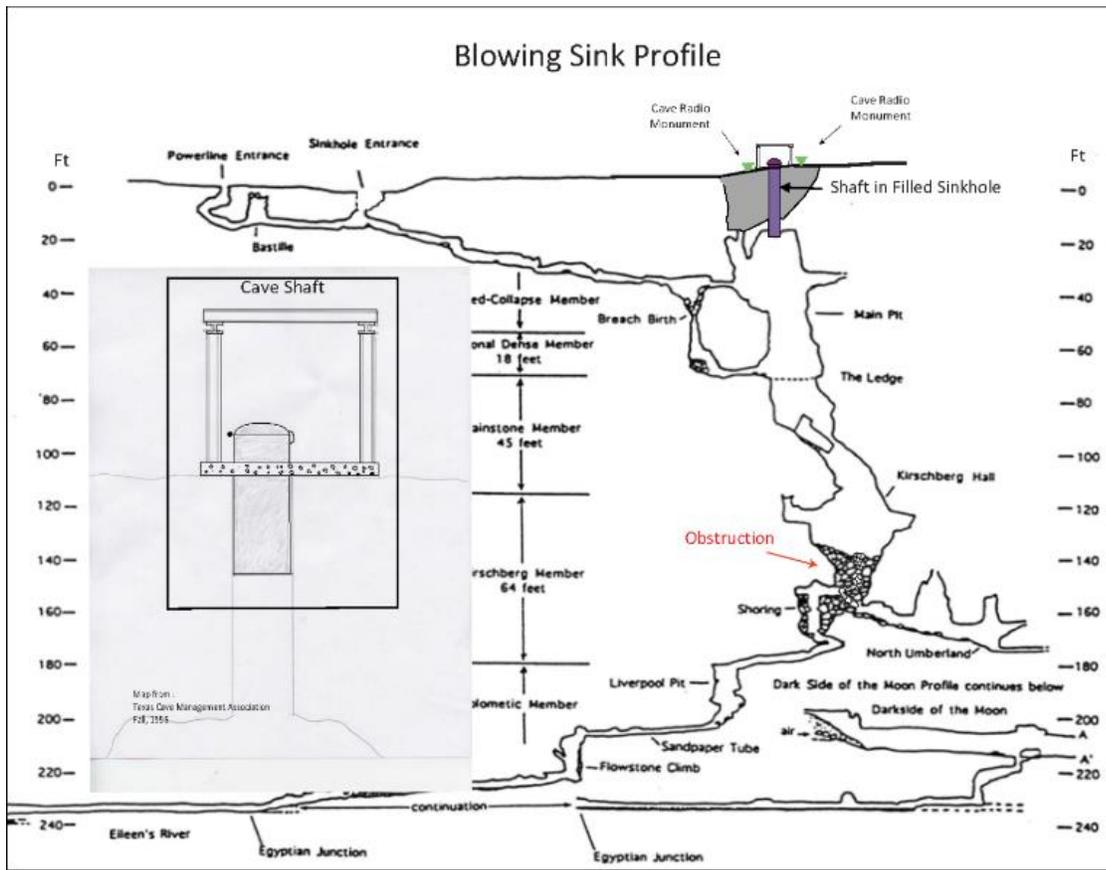


Figure 4. PROFILE OF BLOWING SINK CAVE



SPECIES

The site is within the South Travis County Karst Fauna Region. Importantly, the William H. Russell Karst Preserve has karst features that are inhabited by unique and protected species. While not officially listed for protection, cave crickets (*Ceuthophilus* spp) are considered to be a keystone species for troglotic karst invertebrates (Taylor et al. 2007, USFWS 2012).

Table 1. KARST SPECIES AND STATUS

Species	Location Identified	Status	Permit
<i>Cicurina bandida</i> (Meshweaver Spider)	Blowing Sink Cave	Species of Concern	USFWS permit TE 788841-2
<i>Rhadine austinica</i> (Ground Beetle)	Blowing Sink Cave	Species of Concern	USFWS permit TE 788841-2
<i>Eurycea sosorum</i> (Barton Springs Salamanders)	Blowing Sink Cave	Endangered	USFWS permit TE833851-3 and 4

<i>Ceuthophilus</i> spp (Cave Crickets)	All Karst Features	Keystone	Not on Permit
<i>Stygobromus russelli</i> (Russell's cave amphipod)	<i>Blowing Sink Cave</i>	<i>Imperiled*</i>	<i>Not on Permit</i>

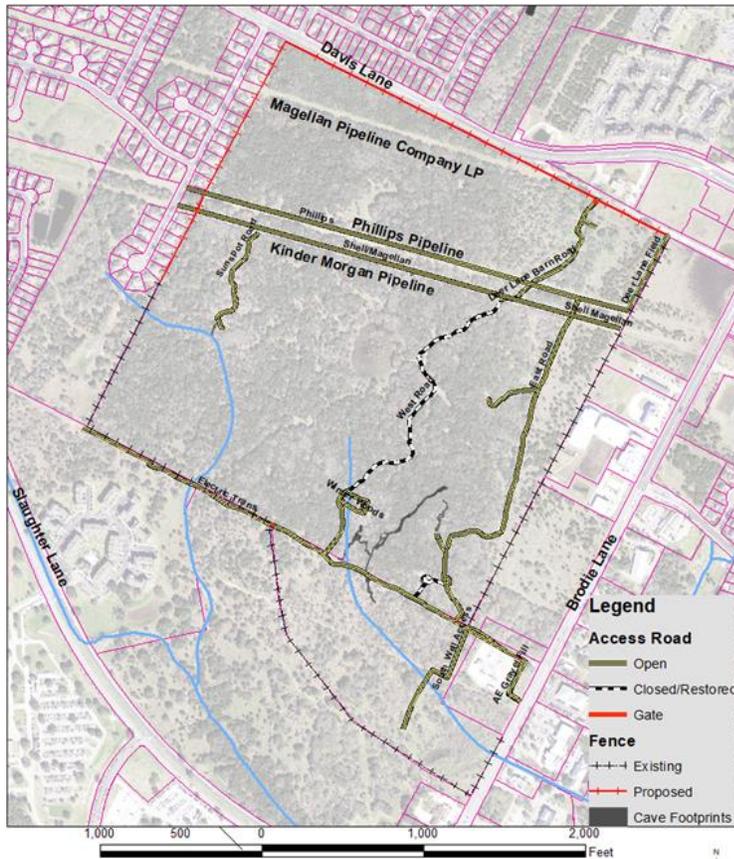
* Species on Texas Parks and Wildlife Department (TPWD) list of Species of Greatest Conservation Need as S1 (Critically Imperiled) and with a global ranking as G1/G2 (Critically Imperiled/Imperiled)

The William H. Russell Karst Preserve contains a diversity of wildlife above ground, as well. Sightings made during site visits and from game cameras include bobcats, gray fox, coyotes, armadillo, raccoons, opossums, porcupine, great horned owls, hawks, turkey vultures, black vultures, narrow-mouth toad, ringtail cats, Texas rat snakes, squirrels, gulf coast and narrow-mouthed toads, plethodons, eastern black necked garter snake, cliff chirping frog, feral hogs, roadrunner, white-tailed deer, tri-color bats, and western diamond-back rattlesnakes. Mammals and bats are considered important biotic components of a karst ecosystem as they supply nutrient input in the forms of guano and scat which benefit resident karst invertebrates (USFWS 2011d).

MANMADE FEATURES

The William H. Russell Karst Preserve is a rugged tract with limited manmade features. There is no dedicated parking, restrooms, or other facilities on the site. There is a small equipment storage barn. Several unimproved access roads cross the William H. Russell Karst Preserve. The site is generally accessed by walking. The preserve abuts Davis Lane to the north and development along Brodie Lane to the east. West of the preserve is a housing development with multiple homes sharing a boundary with the preserve. South of the preserve is an apartment complex and land that will likely be developed in the near future.

Figure 5. INFRASTRUCTURE FEATURES



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 Wildland Conservation Division for the sole purpose of geographic reference. No warranty is made by the City of Austin regarding specific accuracy or completeness.

EASEMENTS

Notably there are several infrastructure easements including one electric transmission line and three petroleum pipelines. The Austin Energy electric transmission line easement crosses one of the entrances to Blowing Sink Cave and is within 50 feet of its primary entrance. Three petroleum pipelines cross the preserve site, in some places as shallow as three feet deep. Currently the three petroleum and natural gas pipelines include the Magellan Midstream Partners LP/Longhorn/former Exxon Pipeline carrying up to 2,225,000 barrels of crude oil per day by gravity from West Texas east to the coast; a Kinder Morgan (formerly Shell) Pipeline carrying liquid natural gas; and a Phillips Pipeline also carrying liquid natural gas (Figure 3).

MANAGEMENT APPROACHES

Detailed descriptions of management measures for karst preserves with federal permit caves are provided in BCP (2016 or future updates). The roles and responsibilities of each managing entity necessary to implement this plan will be described in a separate Interdepartmental Agreement approved by the director of each of the managing departments.

VEGETATION MANAGEMENT

Providing adequate protection of surface plant and animal communities in cave preserves benefits troglodytes and also protects other sources of nutrient input in the form of roots, leaf-litter and wood debris thereby creating a higher probability of long-term survival for protected karst invertebrates (USFWS 2012). Protecting the surface environment around caves involves maintaining high quality and adequate water quantity to the cave ecosystem, achieved through protection of a cave's surface and subsurface drainage basins (USFWS 2012). Well protected drainage basins provide necessary moisture and stable temperatures in cave habitats, and ensure these ecosystems are free from contaminants. COA BCP staff planted and now water vegetation around the restored caves with the goal of improving habitat for cave crickets and stabilizing the soil.

Specific vegetation management approaches include:

- Camouflaging cave entrances by allowing woody vegetation to flourish and avoiding clearing of native vegetation within cave cricket foraging areas.
- Enhancing the habitat by planting locally collected native seed appropriate to the habitat with an emphasis on enhancing habitat for cave crickets. Specifically, within 300 feet of the cave entrances pulpy native, nutritious vegetation such as Texas persimmon, Ashe juniper, Mexican plum, agarita, rusty blackhaw viburnum, Texas mulberry, Carolina buckthorn, and other species of native plants should be planted and maintained.
- Controlling non-native vegetation in the critical area around a cave through mechanical means.
- If chemical control methods to eliminate non-native plants around caves are absolutely necessary, herbicide treatments will be limited to cut stump methods or by stem injection with an EZ-Ject lance, injecting herbicide shells directly into the base of the trees. To the greatest extent possible, chemicals should not be used on the site.
- Developing a site specific Integrated Pest Management (IMP) plan.
- Maintaining tree canopies including Ashe juniper-oak woodlands and other native tree canopies within the preserve.

WILDLIFE COMMUNITY MANAGEMENT

Game cameras placed onsite for site security also capture wildlife photos that are archived and inventoried. Wildlife observations are also made during site visits and particularly evening cave cricket exit counts. Predators may play an important role in a balanced ecosystem and may serve to limit deer and feral hog overpopulation. Excessive white-tail deer populations can result in excessive browsing of vegetation that can impact both golden-cheeked warbler and cave cricket nutrient input. Feral hogs are not native to Texas, can rapidly reproduce, and cause excessive erosion and vegetation damage to sites. Ecosystems with a high diversity of predators, particularly coyotes, bobcats, foxes, and opossums, are associated with reductions in rodents (Ostfeld et al., 2018) or reduction in rodent infestation (Hofmeester et al, 2017) with tick-borne diseases such as Lyme disease. In the Austin area, tick-borne relapsing fever is a concern for South Austin caves (Campbell et al, 2018; Strickland, 2018). Western diamondback rattlesnakes, other snakes, owls and other predatory birds also prey on rodents which may limit the spread of tick-borne and other diseases.

To protect karst species of concern, it is important to reduce potential threats to habitat and cave crickets. This includes proactively working to remove these threats including red imported fire ants and tawny crazy ants. Although other species are of concern such as feral hogs and white-tailed deer could impact the tract, management of these animals is not the primary focus at this point in time.

Red Imported Fire Ants (Solenopsis invicta)

Red imported fire ants, if left unchecked, can devastate cave ecosystems (USFWS 2014a). The preserve site will be maintained with closed tree canopy to suppress red imported fire ants (*Solenopsis invicta*). Within 500 feet of each cave entrance, red imported fire ant mounds will be surveyed and treated with boiling water twice annually by individuals capable of identifying the ants. Native ant populations will be preserved.

Tawny Crazy Ants (Nylanderia fulva)

Tawny crazy ants were transported from South America to Houston around 2002 and first observed in Austin in 2012. They have been observed as close as two-miles away from this site. Tawny crazy ants can devastate both wildlife and cave ecosystems. Its introduction to the preserve would have catastrophic consequences which is why the introduction of offsite materials to the preserve should be avoided, if possible. If fill is needed, it must be inspected at the source by a City of Austin biologist. A microsporidian pathogen (*Myrmecomorba nylanderiae*) was discovered by entomologist Ed LaBrune infecting tawny crazy ants of Texas and Florida and it appears to be effective in treating the ant population (LaBrune 2018).

SITE SECURITY

The 1996 Balcones Canyonlands Conservation Plan requires adequate fencing and signage for preserve access control. Fencing along perimeter boundaries, and posting of signs along perimeter fences, gates, and other access points should be installed as soon as funds are available to achieve human access control (USFWS 1996).

In 1991 two young adults were rescued from Blowing Sink Cave. On June 27, 2011 the cave gate to Blowing Sink was found cut and there were indications that a group descended as far down as Eileen's River. In 2015 robbers established a camp on the William H. Russell Karst Preserve, where an ATM stolen from Austin Zoo was recovered. The same robbers also broke into and stole City equipment from the equipment storage barn onsite, and vandalized contractor vehicles. To secure the site, in 2016 Watershed Protection paid for the installation of a security fence along the Southwest boundary of the property and installed new gates along the western boundary in order to secure the restoration work performed. An additional roughly 4,200 feet of chain link fence is required along Davis Lane to the north and along the west side behind residences. The City of Austin will maintain fences and gates.

Blowing Sink, Brownlee, Winter Woods, Sinky Dinky, Sink in the Woods (Williams Well), and Wyoaka Caves are currently gated to protect targeted species from potential harm from the public, prevent accidental injury to the public from falls, and to prevent unauthorized access to the cave. Note that the existing cave gates may restrict potential cave habitat for troglodytes such as bats that can provide nutrients to the ecosystem and are targets for preservation themselves (see Wildlife Community Management). Consequently, the decision to gate or leave them ungated will be balanced with the need to promote cave ecosystems, particularly as perimeter fencing reduces risks of trespassing.

WILDFIRE PREPAREDNESS

No camping or campfires are permitted on the preserve. PARD has an existing interlocal agreement with Austin Fire Department for wildfire protection. To reduce wildfire risk, the goal is to implement shaded fuel breaks along the border of the William H. Russell Karst Preserve, as well as working with the neighborhood using Firewise education.

hot vehicle exhaust can ignite grass along the powerline and pipeline right of ways that can potentially cause a wildfire. Anyone driving within the preserve must have a fire extinguisher, check the exhaust and undercarriage while parking or idling, and monitor closely for ignitions. Parking on a tarp in high grass may reduce the chance for ignition. High risk areas on the preserve are along the petroleum pipeline corridors where grass is present with potentially catastrophic consequences of causing a petroleum pipeline explosion. Researchers and contractors are required to complete a Wildfire Prevention Plan as part of access authorization.

CAVE RESTORATION

Prior to and shortly after City of Austin acquisition of the preserve, the cave community, particularly UT Grotto and Texas Cave Management Association, maintained the caves by unplugging them and building temporary wooden shafts on some to keep unauthorized people out and retain the openings (Russell, 1996; Shade et al., 2010). The City of Austin has conducted considerable restoration of five major karst features located on the tract. All cave work on the site will be permitted through an AW BCP research permit. The AW BCP “Austin Cave Activity Hazards and Safety Report” (Hauwert, 2018 or updated version) describes the hazards specific to caves and pertinent safety regulations /standards. The draft AW BCP “Guidelines for Cave Restoration” (Hauwert et al., 2020) describe the general procedures for cave restoration, steps to protect sensitive cave ecosystems, sedimentation erosion controls preferred for sensitive preserves, and scientific monitoring to evaluate the effects of restoration. It will be important to collect, evaluate, and archive significant historical artifacts including bones and potential stone tools, during any cave management activities. Artifacts should be submitted to AW BCP staff, who will have them analyzed for historical significance. Bones are typically evaluated at the Vertebrate Paleontology Laboratory of the University of Texas at Austin Texas Memorial Museum for paleontological significance. Stone points and other likely human artifacts are typically evaluated by archeologists typically coordinated through Texas Cave Management Association to evaluate cultural significance. Once historically significant artifacts are identified, further work will be coordinated with the Texas Historical Commission as appropriate. Because of limited funding and staff with specialized experience and training for cave restoration, the City will facilitate the assistance of cave-trained individuals that meet the requirements for obtaining City of Austin Cave Access permit.

Blowing Sink

Remove rock obstruction in Breached Birth and below Kirschberg Hall within two years (2023) to restore and maintain cave habitat and access to the stream passage for future hydrological studies, and to monitor karst species of concern, as well as the endangered Barton Springs salamander.

Sinky Dinky, Wyoaka, Winter Woods, Sunspot, Sunspot Annex, and Williams Well Caves

Excavation of sediment fill from these caves can expand karst ecosystem habitat, and potentially connect to and enhance the accessible ecosystem of BCCP protected Blowing Sink Cave. Sediment removal is also necessary to maintain the caves so that they naturally recharge. These caves have considerable sediment fill remaining that necessitates removal. Following restoration some of these caves, such as Sunspot or Sinky Dinky, may potentially foster bat habitat.

Flat Sink

The entire sediment fill of Flat Sink should be removed to restore recharge and restore habitat for cave ecosystems. The sediment within the sinkhole should be carbon dated at one-foot intervals in a test excavation extending to the bedrock, and if greater than 2,000 years old, the remaining fill should be screened for archeological/paleontological artifacts or as otherwise specified by a paleontologist/archeologist.

Jody Lane Sink

As a lesser priority, restoration of Jody Lane Sink might be considered as it is likely to connect to the downstream cave stream in Blowing Sink Cave. Currently the cave serves as habitat for several western diamondback rattlesnakes that should not be disturbed unless resources for a major restoration effort are available and worth temporarily and safely displacing the snakes.

Brownlee Cave

Brownlee Cave has been designated habitat for western diamondback rattlesnakes as it was originally found in 2013. At this time the cave is not designated for additional excavation. If the cave plugs again in the future and is not offset by other cave drains such as nearby Flat Sink, further excavation may be considered.

Additional likely filled caves exist on the preserve that have not yet been restored but should be as resources are available.

PIPELINES

Three petroleum pipelines cross the preserve site. Accidental ruptures of the lines have occurred in the area as a result of third party damage (Rose, 1986; Texas Railroad Commission spill records accessed 1999). The historical spills in the vicinity of the preserve included an estimated 1,100 barrels of crude oil from an 18-inch Exxon (now Magellan Pipeline Company LP) pipeline 4,000 feet west of the preserve on October 11, 1976, an estimated 1,100 barrels from the same Exxon Pipeline about 8,000 feet east of the preserve on October 27, 1979, and at least 2,300 barrels of crude oil from a 24-inch Shell Pipeline on May 27, 1986 about 10,000 feet west of the preserve. Following the 1986 Shell Pipeline Spill of crude oil, petroleum fumes were detected 2,000 feet east in Grassy Cove Cave and 1.2 and 1.7 miles northeast of the spill site in Get Down and District Park Caves (Russell, 1987). During the week of August 15, 2013, a reported 300 gallons was spilled from the Magellan/Longhorn/Exxon Pipeline about 6,800 feet west of the preserve while conducting maintenance on a valve (Haurwitz, 2013). The lines potentially carry high loads of petroleum and once the nearest upstream valve is closed after a release is detected the line can still drain considerably from the upstream valve. Any release is potentially catastrophic, even when the product is listed as liquid natural gas since a liquid phase component is usually present. Therefore, steps should be taken to prevent accidental releases including:

- avoiding driving heavy machinery along the pipeline easements,

- being aware and prepared for potential wildfire ignition when driving on the preserve (see Wildfire Prevention),
- contacting One-Call prior to any excavation within the easements,
- contacting the pipeline operators in advance of any construction within the easements.
- Reporting potential petroleum-associated smells such as gasoline or rotting egg (hydrogen sulfide) to the City of Austin Watershed Protection Department Spill Response Hotline (512-974-2550)

ROADS

Several unimproved access roads cross the William H. Russell Karst Preserve. Vehicular traffic through the preserve site, particularly during wet conditions, has resulted in those roads becoming wet-weather drainages which divert runoff away from their natural cave destinations. Driving onsite should be avoided, however, should driving be required and it results in erosion/rutting, then the responsible party will make arrangements to restore the road.

Austin Energy Electric Transmission Line Easement

An electric transmission line crosses one of the entrances for Blowing Sink Cave and within 50 feet of its primary entrance. Vehicular access along the transmission line is normal for maintenance but may cause severe erosion during wet-weather conditions. Vehicular access may be required under emergency conditions and may cause erosion of the easement that requires repair from the responsible party. Native vegetation should be maintained around the entrance to Blowing Sink Cave located within the easement.

EMERGENCY RESPONSE

PARC and AW BCP will work together to draft an emergency response plan to address potential concerns associated with the proximity of transmission line easements and petroleum pipelines (BCP 2016).

MONITORING

This plan does not represent a static approach to restoration but rather a guiding reference. Monitoring the trends in species composition, richness and diversity, as well as the degree of success in restoring recharge reaching karst features, should guide effective adaptive management. A fully functional karst system is not solely composed of a particular set of plant species, but fosters a diverse array of animal, bacteria, and fungi species above and below ground. Monitoring these other community components will provide a more complete evaluation of restoration success. Effectiveness depends on many complex variables and needs to be monitored, evaluated and adjusted. Therefore, this plan will be reviewed at least every five years and updated as needed (USFWS 1996, p. 2-32).

Regular monitoring includes:

- Establishing permanent sampling points for plants and vegetation transects to establish a baseline vegetation survey that is replicable.
- Routine inspections of cave area for signs of unauthorized entry or impacts by invasive species including red imported fire ants/tawny crazy ants, feral hogs, etc.

- Monitoring of cave species (listed and unlisted, cave crickets, vegetation, and mammals).
- Monitoring environmental conditions (in-cave and on the surface).
- Recording every visit in Blowing Sink Cave including date, time, number of visitors, observations, and temperature, and humidity.
- Including geochemical and mineral parameters and potential pollutants for groundwater and drip water samples.
- Developing a list for standardized water quality monitoring.
- Perimeter monitoring two times a year.
- Surveying red imported fire ants at least twice a year, preferably spring and fall to determine densities.
- Placing game cameras onsite two times a year to capture wildlife photos that are archived and inventoried.
- Wildlife observations made during site visits and particularly evening cave cricket exit counts should be recorded.
- Completing annual cave faunal surveys. Faunal surveys will be performed annually per USFWS monitoring protocols (USFWS 2014b) for karst species of concern listed in the BCCP permit including the cave obligate meshweaver spider (*Cicurina bandida*) and the cave obligate ground beetle (*Rhadine austinica*).
- Conduct cave cricket exit counts at Blowing Sink Cave once or twice a year.

BARTON SPRINGS SALAMANDER

Once the obstruction from Blowing Sink Cave is removed, scientific studies of *Eurycea sosorum* in Blowing Sink Cave or other sites on the tract as appropriate may be conducted.

HYDROGEOLOGIC STUDIES

Hydrogeological studies of Blowing Sink and other caves should continue to delineate source areas and monitor changes to baseline water quality and quantity. The Blowing Sink Cave stream, Eileen's River, will need work completed by removing rocks and sediment to be accessible so that water sampling can be conducted to evaluate its status and trends for proactive management. The US Geological Survey has been collecting annual water well samples as part of its National Water Quality Assessment (NWQA) program and should be allowed to continue this sampling. Two wells on site should also be sampled. Since contaminants typically move in plumes associated with flushing rain events or discrete releases, a monitoring system that collects multiple samples (such as each 6 hours over 8 days following a contamination event or significant rain event) for a wide range of constituents best characterizes the water quality.

SITE ACCESS

Access to the site is restricted to permitted and escorted individuals and staff of the managing departments. The site is generally accessed by walking. Limited parking is available at 9612 Brodie Lane in front of the electric substation but should not block access roads or rut wet ground. On the north side of the William H. Russell Karst Preserve approved parking is possible on the closed portion of Deer Lane access through the City of Austin Fire Station No. 29 at 3703 Deer Lane 78759. Access through a gate on the Kinder Morgan Pipeline off Ovilla Drive is also a potential access point for the preserve.

VISITOR MANAGEMENT

Public access to the William H. Russell Karst Preserve is limited to permitted access and is not generally open for public access. This is because it is challenging to foster a sensitive preserve site with potentially dangerous wildlife, caves that may eventually be left open to foster bat and other habitat, and no parking or public facilities that could contaminate the sensitive karst network. Access is generally accomplished through several means:

- Guided tours and educational access.
- Guided volunteer projects that require specific training. PARD currently limits volunteer activities in caves to those with specific training and additionally requires a City staff member to be present.
- Permitted access for specific research and restoration projects.
- Access defined by work contract or managing agreement that includes provisions for City-required liability in case of accidental injury.

CAVE COMMUNITY SUPPORT FOR MANAGEMENT

Historically caver stewards from the local cave community have played an important role in maintaining the caves of the William H. Russell Karst Preserve. It is important to continue the legacy of Bill Russell's work on behalf of the City of Austin to further explore and document the City's karst resources with knowledgeable stakeholders in the community.

ACCESS AUTHORIZATION

Visitors will either be escorted by City staff or authorized in accordance with procedures mutually agreed upon by PARD and AW BCP.

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APPENDIX A1. EXECUTIVE SUMMARY FOR FORUM PUD MITIGATION
(March 11, 1999)

**FORUM PLANNED UNIT DEVELOPMENT
EXECUTIVE SUMMARY**

Project Description

Applicant:	Mrs. Catherine Brownlee
Property:	Development Tracts Tract I: 3.11 acres @ William Cannon Dr. Tract II: 77.11 acres @ Mopac and William Cannon Dr. Tract III: 37.54 acres @ Mopac Blvd. Preserve Tracts Tract IV: 147.23 acres @ William Cannon Dr. Blowing Sink Tract: 165.21 acres @ Deer Lane
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	Total: 430.20 acres
Current Zoning:	SF-2 on 259.51 acres GR-CO and CS on 5.48 acres
Current Watershed Regulation:	SOS Ordinance
Proposed Zoning:	Planned Unit Development (PUD) on all Tracts (except Blowing Sink Tract) to allow commercial/ office uses on Development Tracts and ecological classroom use on Preserve Tract. PUD proposes to modify the site-by-site application of SOS to the project, and instead meet impervious cover limits of SOS on an overall basis

FORUM PLANNED UNIT DEVELOPMENT

EXECUTIVE SUMMARY

Water Quality

- The Forum proposes less impervious cover than would be allowed on the development and conservation tracts under the SOS ordinance.
- Forum will meet the SOS pollution reduction standard of no increase in the average annual pollutant load from the developed tracts.
- Forum will provide water quality controls that exceed the City's current design specifications.
- Forum impervious cover will be phased to follow a full scale demonstration of water quality control effectiveness.

Transportation

- Forum development traffic can be accommodated within existing MoPac traffic lanes.
- Forum development contributes only negligibly to existing or future MoPac peak hour commuter traffic. The contribution from the proposed development to peak hour commuter traffic would be significantly less than the contribution from single family development.
- Forum will fund 100% of the cost of the recommended traffic improvements, even though its pro rata share of those improvements is less than 50%. Forum will be reimbursed for amounts in excess of their pro rata share from required contributions from other private development.
- The Forum will reduce the number of vehicle miles traveled, and associated congestion, by providing local commercial and retail services.
- The Forum supports alternative transportation with a bike and pedestrian trail system, shower requirements, and transit stops if requested by the transit authority.

Neighborhoods

- Western Oaks neighborhood, adjacent to the western development tracts boundary, supports the Forum.
- Bannockburn neighborhood, adjacent to the eastern development tracts boundary, supports the Forum.
- "ABC Streets"/Whispering Oaks neighborhood, adjacent to the proposed Ecological Classroom tract, supports the Forum.
- No neighborhoods receiving notice oppose the Forum zoning.

Blowing Sink Mitigation land

- The Forum proposes to purchase and conserve, free of any development, 167 acres containing the entrance and much of the contributing drainage area to Blowing Sink Cave. Blowing Sink Cave is 254 feet deep, the deepest cave in Travis County. It is the only cave known to descend to the Barton Springs Edwards Aquifer water table level.
- Blowing Sink tract contains at least nine other karst features or cave openings.
- The Blowing Sink tract has been identified by Mr. Nico Hauwert of the Barton Springs/Edwards Aquifer Conservation District as the single most significant tract in Travis County for direct recharge to Barton Springs.

Environment and Planning

- Forum proposes retail, restaurant, medical, assisted living, and office development to meet needs that have been identified by existing adjacent neighborhoods.
- Forum will be required to comply with state-of-the-art "Green Builder" design specifications.
- The Forum will require no extensions of publicly-funded utility or transportation infrastructure.
- The Forum will preserve 312.44 acres, consisting of the Preserve Tract and the Blowing Sink Tract, in their natural state.

provide passive recreation and outdoor education for the people of the Central Texas area concerning the nature, wildlife and ecosystems of Central Texas, subject to the reservations, exceptions and restrictions set forth below, which reservations, exceptions and restrictions shall be construed as prior to, and superior to, the dedication for park purposes described in this paragraph. Specifically, as a condition of and by acceptance of this conveyance, the City of Austin hereby dedicates the Property for the following purposes and subject to the following limitations and restrictions:

1. Purpose. The conveyance and dedication set forth in this Deed is made to satisfy the requirement that development of the Property be restricted as established in City of Austin Zoning Ordinance No. 990408-14 (the "PUD Ordinance"). This conveyance and all express and implied warranties are made and accepted subject to said zoning ordinance. The purpose of this conveyance is to (a) provide outdoor education for the people of the Central Texas area concerning the nature, wildlife and ecosystems of Central Texas; (b) ensure that the Property will be retained forever predominantly in its natural and open space condition; (c) maintain or improve the natural hydrological processes and land health that currently exist on the Property; (d) allow for any wildlife management operations that are taking place which contribute to such hydrological processes; (e) provide for the conservation, maintenance and enhancement of the quality and quantity of the Barton Springs segment of the Edwards Aquifer and Grantee's water supply, including, without limitation, pollution avoidance, watershed protection and preservation and enhancement of base flow or recharge; and (f) prevent any use of the Property that will impair or interfere with the conservation values of the Property. The Grantor intends that this conveyance will restrict the use of the Property as provided herein.

2. Prohibited Uses. Any activity on or use of the Property inconsistent with the purposes of this conveyance is prohibited. Without limiting the generality of the foregoing, the following activities and uses are expressly prohibited:

2.1 **No Surface Alteration.** There shall be no ditching, draining, diking, filling, excavating, dredging, mining, drilling or other alteration of the surface of the Property, no disturbance of the subsoils (including, but not limited to, the excavation or removal of soil, sand, gravel, rock, peat, or sod, or the placing of soil or other substances and materials such as land fill or dredging spoils), and no other activities on the Property that could cause erosion or siltation thereof, except as reasonably necessary for appropriate management of the Property as a nature preserve, and except as may be necessary to restore, maintain or enhance the natural hydrological regime of the watershed or as may be reasonably necessary in the course of any activity permitted herein and except for limited and reasonable activities conducted in conjunction with the educational use or preservation use of the Property as a nature preserve.

2.2 Soil or Water Degradation. Except as reasonably necessary for appropriate management of the Property as a nature preserve, there shall be no change in the topography, surface or subsurface hydrology of the Property in any manner. Any use or activity that causes or is likely to cause soil degradation, erosion or siltation, or depletion or pollution of any surface or subsurface waters shall be prohibited; provided, however, this prohibition shall not be construed so as to restrict the limited and reasonable educational use and preservation use of the Property as a nature preserve.

2.3 Cutting. There shall be no removal, harvesting, destruction or cutting of trees, shrubs, brush or other plants, except incidental select cutting or removal of vegetation as reasonably necessary for appropriate management of the Property as a nature preserve (including maintenance and enhancement of the rangeland consistent with the conservation purposes and fire containment) or as necessary for the limited and reasonable educational use and preservation use of the Property as a nature preserve.

2.4 Biocides. Except as reasonably necessary for appropriate management of the Property as a nature preserve, and preservation use, there shall be no use of pesticides or biocides, including, but not limited to, insecticides, fungicides, rodenticides, and herbicides.

2.5 Dumping. Except as reasonably necessary for appropriate management of the Property as a nature preserve, there shall be no storage or dumping of ashes, trash, garbage, hazardous materials or any other materials that may negatively impact or be detrimental to surface or subsurface waters.

2.6 Storage Tanks. Except as reasonably necessary for appropriate management of the Property as a nature preserve, there shall be no placement or use of any underground storage tanks on the Property. Except as reasonably necessary for appropriate management of the Property as a nature preserve, there shall be no use or placement of other storage tanks on the Property, except as may be existing at the time of this grant.

2.7 Water Use. There shall be no pollution, alteration, manipulation, depletion or extraction of surface or subsurface water (including, but not limited to, ponds, creeks or other water courses) or any other water bodies, nor shall activities be conducted on the Property that would be detrimental to water purity or that could alter the natural water level or flow in or over the Property, except as reasonably necessary for appropriate management of the Property as a nature preserve, and except for activities permitted under Paragraph 4 hereof, and except for the limited and reasonable use of existing creeks and stock tanks in connection with the educational use and preservation use of the Property.

2.8 **Construction.** There shall be no placement or construction of structures or other improvements on the Property, except as reasonably necessary for appropriate management of the Property as a nature preserve, and except in connection with the repair, maintenance, or replacement (but not expansion) of structures and other improvements existing at the time of this grant in their present location, and except for trails and trail markers associated with the educational use and preservation use of the Property.

3. **Grantor's Reserved Rights.** Grantor reserves to herself, and to her successors and assigns, the following rights:

3.1 **Reversion to Grantor.** This conveyance is made on the condition that the City of Austin ordinance zoning other property owned or controlled by Grantor as a Planned Unit Development (City of Austin Ordinance No. 990408-14) remains in full force and effect as a valid zoning ordinance, except as it may be modified with the consent of Grantor or other property owner then owning property covered by the zoning ordinance. In the event that such zoning ordinance is declared entirely or in any part invalid, illegal or unenforceable, or is repealed, superseded or amended, or otherwise rendered ineffective without the consent of Grantor or other property owner then owning property covered by the zoning ordinance, then ownership of the Property shall immediately revert to Grantor, her heirs and assigns, who may immediately upon such occurrence re-enter and occupy the Property and this deed and all of its provisions shall thereupon immediately and automatically be of no further force or effect. The provisions of this Section 3.2 shall expire the earlier of (a) the date on which the maximum amount of impervious cover, and all improvements related thereto, allowed under the PUD Ordinance is completed on the Property, and all permits and approvals required for such completion have been issued by the City of Austin and all applicable governmental entities, or (b) fifteen (15) years from the date this Deed is recorded in the Travis County Real Property Records.

4. **Permitted Uses.** Except for the Prohibited Uses set forth above and subject to the reservations set forth below, the Property may only be used as a nature preserve and to provide passive recreation and outdoor education for the people of the Central Texas area concerning the nature, wildlife and ecosystems of Central Texas.

5. **Enforcement.** Grantor shall have the right to enforce the restrictions set forth herein by any and all remedies available at law or in equity, including, but not limited to, the right to enforce the restrictions by injunction. In the event Grantor prevails in any action to enforce the restrictions set forth herein, Grantor may recover any and all reasonable attorneys fees and court costs associated with such action.

6. **Survival of Easements.** The two (2) electric easements granted to the City of Austin as recorded in Volume 11856, Page 884 and Volume 12817, Page 566 of the Real Property Records of Travis County, Texas, and all other easements granted to the City of Austin over,

under or upon the Property, shall survive this conveyance to the City of Austin and shall not be merged into this Deed by its execution and delivery to the City of Austin.

RESERVATIONS FROM AND EXCEPTIONS TO CONVEYANCE AND WARRANTY:

The use of the herein described Property as a nature preserve and to provide passive recreation and outdoor education for the people of the Central Texas area concerning the nature, wildlife and ecosystems of Central Texas is expressly restricted and limited (subject to the restrictions set forth in this Deed) by the right of the City of Austin, which right is herein conveyed by the Grantor, to construct, reconstruct, repair, remove, replace, relocate, and maintain utility lines of all kinds and descriptions, including, but not limited to, water, sewer, drainage, electric, telegraph, telephone, and telecommunication, on, over, under, and across the above-described Property, and connections with any of the foregoing to similar utilities on, under, or across contiguous and adjacent property, provided that the location of said lines and structures, and connections are first approved by the Director of the Department of Public Works and Transportation of the City of Austin and/or the Director of Water and Wastewater Utility of the City of Austin, as appropriate, and further approved by the Director of the Parks and Recreation Department of the City of Austin and the Director of the Watershed Protection Department, as to: (a) whether such road, street, line, structure, or connection constitutes an environmental or safety hazard or adversely impacts the preservation purposes of the Property in relation to the use of the herein described Property for educational purposes; and (b) if approved under (a), the location of said road, street, line, structure, or connection. This conveyance is further made and accepted subject to the matters listed as Permitted Exceptions on EXHIBIT "B" attached hereto and incorporated herein by reference the same as if fully copied and set forth at length.

Grantor binds Grantor and Grantor's heirs, executors, administrators, successors and assigns to **WARRANT AND FOREVER DEFEND** all and singular the Property to Grantee and Grantee's successors and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof, by, through, or under Grantor, but not otherwise.

When the context requires, singular nouns and pronouns include the plural.

IN WITNESS WHEREOF, Grantor has caused this instrument to be executed on this the 18 day of February, 2000.

GRANTOR:



~~Catherine Brownlee~~

South Cane Patch, Ltd. *JMO*

By: Brownlee Investments, L.L.C.

5 By: Catherine Brownlee
Catherine Brownlee, Member, Manager

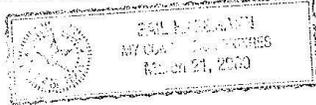
ACKNOWLEDGMENT

STATE OF TEXAS §
 §
COUNTY OF TRAVIS §

This instrument was acknowledged before me on the 18th day of February, 2000, by

Catherine Brownlee, ~~individually~~, Member, Manager for Brownlee Investments, L.L.C., Limited Partner of South Cane Patch, Ltd.

(SEAL)



Gail Hagemann
Notary Public in and for the State of Texas

ACCEPTANCE BY THE CITY OF AUSTIN

The City of Austin, by the signature of its duly authorized representative hereto, does accept the grant of parkland as hereinabove described, subject to all provisions and conditions contained herein.

EXECUTED as of the 18th day of February, 2000.

CITY OF AUSTIN

By: *Jesus M. Olivares*
Jesus M. Olivares, Director
Parks and Recreation Department

APPROVED AS TO FORM:

Raul Calderon
Raul Calderon,
Assistant City Attorney

JP

AFTER RECORDING, RETURN TO:

City of Austin
Attn: Real Estate Services Division
P.O. Box 1088
Austin, Texas 78767-8839

Austin Title Company
2700 Bee Cave Road, Suite 100
Austin, Texas 78746

JSH:[ka] #1194
f:\brownlee, caw hills\apoc\1 warranty deed (165-acre tract) - jt

6 RETURN TO AUSTIN TITLE / AMERICAN

FIELD NOTES

BEING A 165.27 ACRE TRACT OF LAND LOCATED IN THE SAMUEL W. HAMILTON SURVEY NO.16 IN TRAVIS COUNTY, TEXAS, SAME BEING A PORTION OF A 196.272 ACRE REMAINDER PORTION OF A 200-ACRE TRACT OF LAND CONVEYED TO JEANETTE DAWSON CARROL, ET AL BY INSTRUMENT RECORDED IN VOLUME 2522, PAGE 442 OF THE DEED RECORDS OF TRAVIS COUNTY, TEXAS; SAID 165.27 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING at a 1/2-inch iron found for the northwest corner of said 196.272 acre tract, same being the northeast corner of that certain 39.891 acre tract conveyed to Davis Lane, Ltd. by deed recorded in Volume 12391, Page 395 of the Real Property Records of Travis County, Texas, said iron rod also being in the south line of Deer Lane (ROW Varies);

THENCE S 60°00'00" E along said south line of Deer Lane, same being the north boundary line of said 196.272 acre tract a distance of 2,662.98 feet to a 1/2-inch iron rod set for corner;

THENCE S 30°06'33" W departing the southerly right-of-way line of Deer Lane, through the interior of said 196.272 acre Tract a distance of 2,712.15 feet to a 1/2-inch iron rod set in the northerly boundary line of a 214.875 acre tract of land conveyed to Circle C Development Joint Venture by instrument recorded in Volume 11620, Page 1126 of said Deed Records, same being the southeast corner hereof, and from which a 1/2-inch found for the northwest corner of a 4.944 acre tract of land conveyed to the City of Austin by instrument recorded in Volume 12964, Page 1223 of said Deed Records, same being the southeast corner of a 0.987 acre tract of land conveyed to the City of Austin by instrument recorded in Volume 12817, Page 575 of the said Deed Records bears S 59°53'27" E a distance of 80.46 feet;

THENCE with the northerly boundary line of said 214.875-acre Tract the following four (4) courses:

1. N 59°53'27" W a distance of 434.43 feet to a 5/8-inch iron pipe found;
2. N 59°39'31" W a distance of 385.53 feet to a 5/8-inch iron pipe found;
3. N 59°58'42" W a distance of 887.11 feet to a 5/8-inch iron pipe found;
4. N 60°07'52" W a distance of 941.21 feet to a 5/8-inch iron pipe found for the southeast corner of a 39.891 acre tract of land conveyed to Davis Lane, Ltd. by instrument recorded in Volume 12391, Page 395 of said Deed Records, same being the southwest corner hereof;

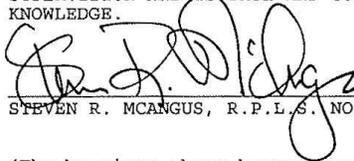
THENCE departing the northerly boundary line of said 214.875 acre tract, with the easterly boundary line of said 39.891 acre, same being the westerly boundary line of said 196.272 acre tract the following three (3) courses;

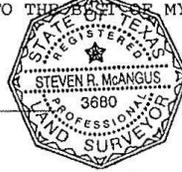
1. N 29°43'22" E a distance of 1259.32 feet to a 5/8-inch iron pipe found on an angle point hereof;
2. N 29°47'12" E a distance of 729.51 feet to a 5/8-inch iron pipe found on an angle point hereof;

January 12, 1999
Job No. 98-213
165.27 Acre Tract
Page 2 of 2

3. N 29°56'31" E a distance of 722.02 feet to the POINT
OF BEGINNING of the herein described tract and
containing 165.27 acres of land.

I HEREBY CERTIFY THAT THIS METES AND BOUNDS DESCRIPTION WAS
PREPARED FROM A SURVEY PERFORMED ON THE GROUND UNDER MY
SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY
KNOWLEDGE.


STEVEN R. MCANGUS, R.P.L.S. NO. 3680



(The bearings shown hereon are referenced to deed recorded in
Volume 2522, Page 442 of the Deed Records of Travis County,
Texas.)

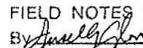
FIELD NOTES REVIEWED
By  Date *2/24/2000*
Engineering Support Section
Department of Public Works
and Transportation

EXHIBIT "B"**PERMITTED EXCEPTIONS**

1. Any discrepancies, conflicts, or shortages in area or boundary lines, or any encroachments, or protrusions, or any overlapping of improvements.
2. Standby fees, taxes and assessments by any taxing authority for the year 2000 and subsequent years, and subsequent taxes and assessments by any taxing authority for prior years due to change in land usage or ownership.
3. Any portion of the property herein described which falls within the boundaries of any road or roadway.
4. Regulations contained in City of Austin Zoning Ordinance No. 990408-14.
5. An easement dated January 7, 1929, granted to Shell Pipe Line Corporation by Jennie Davis Dawson and husband, N.A. Dawson, recorded in Volume 433, Page 61, Deed Records, Travis County, Texas. (Blanket easement for pipeline, together with all rights recited therein)
6. An easement dated January 7, 1929, granted to Shell Pipe Line Corporation by Jennie Davis Dawson and husband, N.A. Dawson, recorded in Volume 433, Page 253, Deed Records, Travis County, Texas. (Blanket easement for pipeline, together with all rights recited therein)
7. An easement dated December 6, 1949, granted to Humble Pipe Line Company by Joe J. Dawson, recorded in Volume 994, Page 391, Deed Records, Travis County, Texas. Said easement having been assigned to Longhorn Partners Pipeline, L.P., a Delaware limited partnership, by instrument recorded in Volume 13051, Page 141, corrected and re-recorded in Volume 13202, Page 76, Real Property Records, Travis County, Texas. (Blanket easement for pipeline, together with all rights recited therein)
8. An easement dated December 24, 1992, granted to the City of Austin by Diana Dawson Zumwalt, *et al.*, recorded in Volume 11856, Page 884, Real Property Records, Travis County, Texas. (Blanket easement for electric lines and systems, together with all rights recited therein)
9. An easement dated November 13, 1996, granted to the City of Austin by N.D. Dittmar & Co., a Partnership, *et al.*, recorded in Volume 12817, Page 566, Real Property Records, Travis County, Texas. (Easement for electric transmission, distribution and telecommunications lines and systems, together with all rights recited therein)
10. Any visible and/or apparent roadway or easement over or across the subject property, the existence of which does not appear of record.

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS



07-19-2000 01:51 PM 2000112392
DAVILAN \$27.00
DANA DEBEAUVOIR ,COUNTY CLERK
TRAVIS COUNTY, TEXAS

OR GUARANTIES OF ANY KIND OR CHARACTER WHATSOEVER, WHETHER EXPRESS OR IMPLIED, ORAL OR WRITTEN, PAST, PRESENT OR FUTURE, OF, AS TO, CONCERNING OR WITH RESPECT TO (A) THE VALUE, NATURE, QUALITY OR CONDITION OF THE PROPERTY, INCLUDING, WITHOUT LIMITATION, THE ACREAGE, WATER, SOIL OR GEOLOGY, (B) THE INCOME TO BE DERIVED FROM THE PROPERTY, (C) THE SUITABILITY OF THE PROPERTY FOR ANY AND ALL ACTIVITIES AND USES WHICH GRANTEE MAY CONDUCT THEREON, (D) THE COMPLIANCE OF OR BY THE PROPERTY OR ITS OPERATION WITH ANY LAWS, RULES, ORDINANCES OR REGULATIONS OF ANY APPLICABLE GOVERNMENTAL AUTHORITY OR BODY, INCLUDING WITHOUT LIMITATION ANY ENVIRONMENTAL PROTECTION, POLLUTION OR LAND USE LAWS, RULES, REGULATIONS, ORDERS OR REQUIREMENTS, (E) THE DISPOSAL OR EXISTENCE, IN OR ON THE PROPERTY, OF ANY HAZARDOUS OR TOXIC MATERIALS, (F) THE HABITABILITY, MERCHANTABILITY, MARKETABILITY, PROFITABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PROPERTY, (G) THE MANNER OR QUALITY OF THE CONSTRUCTION OR MATERIALS, IF ANY, INCORPORATED INTO THE PROPERTY, (H) THE STATE OF REPAIR OR LACK OF REPAIR OF THE PROPERTY, OR (I) ANY OTHER MATTER WITH RESPECT TO THE PROPERTY, EXCEPT FOR THE WARRANTY OF TITLE EXPRESSLY SET FORTH HEREIN AND AS EXPRESSLY SET FORTH IN THE AGREEMENT. GRANTOR SHALL NOT BE LIABLE OR BOUND IN ANY MANNER BY ANY VERBAL OR WRITTEN STATEMENTS, REPRESENTATIONS, OR INFORMATION PERTAINING TO THE PROPERTY, OR THE OPERATION THEREOF, FURNISHED BY ANY REAL ESTATE BROKER, AGENT, EMPLOYEE, SERVANT, OR OTHER PERSON, UNLESS THE SAME ARE SPECIFICALLY SET FORTH OR REFERRED TO HEREIN OR IN THE AGREEMENT.

EXECUTED AND DELIVERED to be effective the 26th day of March, 2014.

CIRCLE C LAND, L.P.
a Texas limited partnership

By: Circle C GP, L.L.C., a Delaware
limited liability company, General Partner

By: Stratus Properties Inc., a Delaware
Corporation, Sole Member and
Manager

By: Erin D. Pickens
Erin D. Pickens,
Senior Vice President

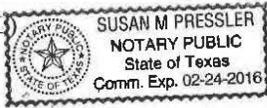
{W0611924.2}

THE STATE OF TEXAS §

COUNTY OF TRAVIS §

This instrument was acknowledged before me this 21st day of March, 2014, by Erin D. Pickens, Senior Vice President of Stratus Properties Inc., a Delaware Corporation, Sole Member and Manager of Sole Member and Manager of Circle C GP, L.L.C., a Delaware limited liability company, General Partner of Circle C Land, L.P., a Texas limited partnership, on behalf of said limited partnership.

(SEAL)



Susan M Pressler
Notary Public, State of Texas

[SIGNATURES CONTINUE ON NEXT PAGE]

{W0611924.2}

RECEIVED, ACCEPTED AND AGREED
TO BY GRANTEE:

CITY OF AUSTIN, a Texas home-rule city
And municipal corporation

msd By: Lauraine Rizer
Name: Lauraine Rizer
Title: Officer, Office of Real Estate Services

THE STATE OF TEXAS §

COUNTY OF TRAVIS §

This instrument was acknowledged before me this 19 day of March,
2014, by Lauraine Rizer, Officer, Office of Real Estate Services of the City of
Austin, a Texas home-rule city and municipal corporation, on behalf of the municipal
corporation.

(SEAL)

Marsha L. Schulz
Notary Public, State of Texas



{W0611924.1}

EXHIBIT A

A tract of 25.651 acres of land, more or less, being a portion of Lot 5, Block "A", CCR '108 Subdivision, a subdivision in Travis County, Texas, according to the map or plat thereof, recorded under Document No. 200300180 of the Official Public Records of Travis County, Texas, and Lot 6B, Block "A", Resubdivision of Lot 6, Block "A", CCR 108 Subdivision, a subdivision in Travis County, Texas, according to the map or plat thereof, recorded under Document No. 200600328 of the Official Public Records of Travis County, Texas, and being more particularly described by metes and bounds shown on Exhibit "A-1" attached hereto and made a part hereof.

{W0611924.2}

EXHIBIT A-1

{W0611924.2}

25.651 ACRES

DESCRIPTION OF 25.651 ACRES OF LAND IN THE SAMUEL HAMILTON SURVEY NO. 16, ABSTRACT NO. 340, TRAVIS COUNTY, TEXAS, BEING A PORTION OF LOT 5, BLOCK "A" OF CCR 108 SUBDIVISION, A SUBDIVISION OF RECORD AS SHOWN ON PLAT DOCUMENT NO. 200300180, OFFICIAL PUBLIC RECORDS OF TRAVIS COUNTY, TEXAS, AND ALSO BEING A PORTION OF LOT 6B, BLOCK "A" OF THE RESUBDIVISION OF LOT 6, BLOCK "A" CCR 108 SUBDIVISION, A SUBDIVISION OF RECORD AS SHOWN ON PLAT DOCUMENT NO. 200600329, OFFICIAL PUBLIC RECORDS OF TRAVIS COUNTY, TEXAS, SAID LOT 5, BLOCK "A", CCR 108 SUBDIVISION AND LOT 6B, BLOCK "A", RESUBDIVISION OF LOT 6, BLOCK "A" CCR 108 SUBDIVISION BEING A PORTION OF THAT CALLED 228.6202 ACRE TRACT, SAVE AND EXCEPT 11.7748 ACRES, DESIGNATED AS EXHIBIT "A-3" AND DESCRIBED IN THE DEED TO CIRCLE C LAND CORP. OF RECORD IN VOLUME 11620, PAGE 1126, REAL PROPERTY RECORDS OF TRAVIS COUNTY, TEXAS; SAID 25.651 ACRES OF LAND, AS SURVEYED BY LOOMIS PARTNERS, INC. AND SHOWN ON PLAN NO. 3321.B, BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING at a 1/2-inch iron rod with a plastic cap stamped "B & P" found in the west right-of-way line of Brodie Lane, same being the west line of a called 0.3888 of one acre tract described in the deed to Travis County of record in Volume 10688, Page 641, Real Property Records of Travis County, Texas, also being the most easterly southeast corner of said Lot 5, Block "A", CCR 108 Subdivision and the northeast corner of Lot 4, Block "A", of said CCR 108 Subdivision;

THENCE N 27° 36' 35" E, with the west right-of-way line of Brodie Lane and the east line of said Lot 5, Block "A", CCR 108 Subdivision, and being also with a west line of the said Travis County 0.3888 of one acre tract, a distance of 70.00 feet to the southeast corner and POINT OF BEGINNING of the tract described herein;

THENCE leaving the west right-of-way line of Brodie Lane, over and across said Lot 5, Block "A", CCR 108 Subdivision and said Lot 6B, Block "A" Resubdivision of Lot 6, Block "A" CCR 108 Subdivision, with the south, southwest and west line of the tract described herein, the following six (6) courses and distances:

1. N 62° 08' 42" W, a distance of 315.87 feet to a 1/2-inch iron rod with a plastic cap stamped "LOOMIS" set for an angle point,
2. N 55° 01' 37" W, a distance of 545.37 feet to a 1/2-inch iron rod with a plastic cap stamped "LOOMIS" set for an angle point,
3. N 38° 28' 05" W, a distance of 660.67 feet to a 1/2-inch iron rod with a plastic cap stamped "LOOMIS" set for an angle point,
4. N 13° 26' 34" W, a distance of 241.57 feet to a 1/2-inch iron rod with a plastic cap stamped "LOOMIS" set for an angle point,
5. N 06° 09' 02" W, a distance of 425.53 feet to a 1/2-inch iron rod with a plastic cap stamped "LOOMIS" set for an angle point, and

{W0611924.2}

6. N 27° 36' 41" E, a distance of 48.01 feet to a 1/2-inch iron rod with a plastic cap stamped "LOOMIS" set in the south line of a called 165.27 acre tract described in the deed to the City of Austin of record in Document No. 2000112392, Official Public Records of Travis County, Texas and the north line of said Lot 6B, Resubdivision of Lot 6, Block "A" CCR 108 Subdivision, for the northwest corner of the tract described herein, from which a 1/2-inch iron pipe found at an angle point in the south line of the said 165.27 acre tract, same being an angle point in the north line of said Lot 6B, Resubdivision of Lot 6, Block "A" CCR 108 Subdivision, bears N 62° 23' 19" W a distance of 368.48 feet;

THENCE S 62° 23' 19" E, with the south line of the said 165.27 acre tract and the north line of said Lot 6B, Resubdivision of Lot 6, Block "A" CCR 108 Subdivision, and being also with the north line of the tract described herein, a distance of 52.64 feet to a 1/2-inch iron rod with a plastic cap stamped "B & P" found at the northeast corner of said Lot 6B, Block "A" Resubdivision of Lot 6, Block "A" CCR 108 Subdivision and the northwest corner of said Lot 5, Block "A", CCR 108 Subdivision, for an angle point in the north line of the tract described herein;

THENCE continuing with the south line of the said 165.27 acre tract, with the north line of said Lot 5, Block "A", CCR 108 Subdivision, and being also with the north line of the tract described herein, the following three (3) courses and distances:

1. S 62° 22' 52" E, a distance of 456.04 feet to a 1/2-inch iron pipe found at an angle point,
2. S 62° 04' 12" E, a distance of 385.47 feet to a 1/2-inch iron pipe found at an angle point, and
3. S 62° 18' 15" E, at a distance of 434.41 feet pass a 1/2-inch iron rod found at the southeast corner of the said 165.27 acre tract, same being the southwest corner of the remaining portion of a 196.27 acre tract described in the deed to South Cane Patch, Ltd. of record in Document No. 2000028175, Official Public Records of Travis County, Texas, and continuing with the south line of the said South Cane Patch tract for a total distance of 520.81 feet to a 3/8-inch iron pipe found at a southeast corner of the said South Cane Patch tract, same being the southwest corner of a called 0.987 acre tract described in the deed to the City of Austin of record in Volume 12817, Page 576, Real Property Records of Travis County, Texas and the northwest corner of a called 4.9448 acre tract described in the deed to the City of Austin of record in Volume 12694, Page 1223, Real Property Records of Travis County, Texas, also being the most northerly northeast corner of said Lot 5, Block "A", CCR 108 Subdivision, for the most northerly northeast corner of the tract described herein;

THENCE S 27° 50' 40" W, with the west line of the said 4.9448 acre tract and the most northerly east line of said Lot 5, Block "A", and being also with an east line of the tract described herein, a distance of 498.89 feet to a 5/8-inch iron rod found at a re-entrant corner of said Lot 5, Block "A", same being the southwest corner of the said 4.9448 acre tract, for a re-entrant corner of the tract described herein;

THENCE S 62° 08' 40" E, with the south line of the said 4.9448 acre tract and a north line of said Lot 5, Block "A", and being also with a north line of the tract described herein, a distance of 432.72 feet to a 1/2-inch iron rod found in the west right-of-way line of said Brodie Lane at the southeast corner of the said 4.9448 acre tract, same being a northeast corner of said Lot 5, Block "A", CCR 108 Subdivision, said 1/2-inch iron rod found being also the northwest corner of the said Travis County 0.3888 of one acre tract and the southwest corner of a called 0.2128 of one acre tract described in the deed to Travis County of record in Volume 10688, Page 621, Real Property Records of Travis County, Texas, for a northeast corner of the tract described herein;

{W0611924.2}

25.651 Acres
Samuel Hamilton Survey No. 18, A-340
Travis County, Texas

Loomis Job No. 100513
FN1222R1(ktm)
Page 3 of 3

THENCE S 27° 36' 35" W, with the west right-of-way line of said Brodie Lane and the east line of said Lot 5, Block "A", CCR 108 Subdivision, and being also with the west line of the said Travis County 0.3888 of one acre tract and with the east line of the tract described herein, a distance of 419.70 feet to the POINT OF BEGINNING and containing 25.651 acres of land, more or less.

BEARING BASIS: Bearing Basis is Texas Coordinate System, Texas Central Zone, NAD 83, Grid.

LOOMIS WORD FILE: FN1222R1(ktm)

THE STATE OF TEXAS §
 § KNOW ALL MEN BY THESE PRESENTS
COUNTY OF TRAVIS §

That I, George L. Sanders, a Registered Professional Land Surveyor, do hereby certify that the above description is true and correct to the best of my knowledge and belief and that the property described herein was determined by a survey made on the ground during the months of July and August 2010 and July 2011 under my direction and supervision.

WITNESS MY HAND AND SEAL at Austin, Travis County, Texas on this 16TH of August, 2011 A.D.

Loomis Partners
Austin, Texas 78746



George L. Sanders
George L. Sanders
Registered Professional Land Surveyor
No. 1838 - State of Texas

FIELD NOTES REVIEWED

By: CLARK DANIEL Date 08-22-2011

Engineering Support Section
Department of Public Works
and Transportation

{W0611924.2}

EXHIBIT B

1. The following restrictive covenants of record itemized below:

BOTH LOTS: Volume 11999, Page 1 of the Real Property Records of Travis County, Texas, Document No(s). 2003087812, 2003161381 amended under 2014042020, 2002151985, amended under Document No. 2004236025; 2002151984, amended under Document No. 2004135909, 2004236024; 2002151986 amended by 2003152218 and 2004135908, 2005054992 and 2005054993 of the Official Public Records of Travis County, Texas, Document Nos. 2012170175 and 2012170176 of the Official Public Records of Travis County, Texas and Plat recorded under Document 200300180 of the Official Public Records of Travis County, Texas.

LOT 6B ONLY: Volume 9911, Page 171 of the Real Property Records of Travis County, Texas and Plat recorded under Document No. 200600328 of the Official Public Records of Travis County, Texas.

2. Any shortages in area.
3. Any titles or rights asserted by anyone, including, but not limited to, persons, the public, corporations, governments or other entities
 - a. to tidelands, or lands comprising the shores or beds of navigable or perennial rivers and streams, lakes, bays, gulfs or oceans, or
 - b. to lands beyond the line of the harbor or bulkhead lines as established or changed by any governments or other entities.
 - c. to filled-in lands, or artificial islands, or
 - d. to statutory water rights, including riparian rights, or
 - e. to the area extending from the line of mean low tide to the line of vegetation, or the rights of access to that area or easement along and across that area
4. Standby fees, taxes and assessments by any taxing authority for the year 2014, and subsequent years.
5. Blanket pipeline easement granted to Humble Pipe Line Company, by instrument dated December 16, 1949, recorded in Volume 994, Page 397 of the Deed Records of Travis County, Texas and assigned in Volume 13051, Page 141, corrected by Volume 13202, Page 76 of the Real Property Records of Travis County, Texas. (BOTH LOTS)
6. Electric and telephone lines and systems easement granted to the City of Austin, by instrument dated October 22, 1973, recorded in Volume 4754, Page 2278 of the Real Property Records of Travis County, Texas. (LOT 5 ONLY)

{W0611924.2}

6. Electric and telephone lines and systems easement granted to the City of Austin, by instrument dated October 22, 1973, recorded in Volume 4754, Page 2278 of the Real Property Records of Travis County, Texas. (LOT 5 ONLY)
7. A 30 foot underground telecommunications systems and lines easement granted to Southwestern Bell Telephone Company, by instrument dated December 20, 1983, recorded in Volume 8402, Page 860 of the Real Property Records of Travis County, Texas, and additionally shown on Plat recorded under Document No. 200300180 of the Official Public Records of Travis County, Texas. (LOT 5 ONLY)
8. Electric and telephone lines and systems easement granted to the City of Austin, by instrument dated March 6, 1985, recorded in Volume 9062, Page 464 of the Real Property Records of Travis County, Texas, and additionally shown on Plat(s) recorded under Document No(s). 200300180 and 200600328 of the Official Public Records of Travis County, Texas. (BOTH LOTS)
9. A 0.12029 acre drainage and lateral support easement granted to Travis County, Texas, by instrument dated January 25, 1988, recorded in Volume 10688, Page 646 of the Real Property Records of Travis County, Texas, and additionally shown on Plat recorded under Document No. 200300180 of the Official Public Records of Travis County, Texas. (LOT 5)
10. All oil, gas and other minerals reserved by Polly Blanton Brooks, in instrument recorded in Volume 4576, Page 1351 of the Deed Records of Travis County, Texas. (BOTH LOTS)
11. An undivided interest in all oil, gas and other geothermal energy sources (but no coal or other minerals) reserved in instrument recorded in Volume 6773, Page 102 and Volume 6886, Page 2396 of the Deed Records of Travis County, Texas. (BOTH LOTS)
12. An undivided interest in all oil, gas and other geothermal energy sources (but no coal or other minerals) reserved in instrument recorded in Volume 6773, Page 102 and Volume 6884, Page 924 of the Deed Records of Travis County, Texas. (BOTH LOTS)
13. All oil, gas and other minerals reserved by Polly Blanton Brooks, in instrument recorded in Volume 8882, Page 748 of the Real Property Records of Travis County, Texas, and being further affected by Mineral and Surface Agreement recorded in Volume 8882, Page 713 of the Real Property Records of Travis County, Texas, and further affected by Warranty Deed and Drillsite Designation recorded in Volume 9807, Page 643 of the Real Property Records of Travis County, Texas and Special Warranty Mineral Deed recorded under Document No. 2010172162 of the Official Public Records of Travis County, Texas. (BOTH LOTS)
14. The terms, conditions and stipulations set out in that certain Conservation Easement to Restrict Impervious Cover between the City of Austin and Circle C Land Corp. dated August 15, 2002, recorded under Document No. 2002151985 amended by Document

{W0611924.2}

15. The terms, conditions and stipulations set out in that certain Development Agreement between the City of Austin and Circle C Land Corp. dated August 15, 2002, recorded under Document No. 2002151984 amended by Document Nos. 2004135909, 2004236024 and 2005054993 of the Official Public Records of Travis County, Texas, including but not limited to Critical Environmental Features Setback. (BOTH LOTS)
16. Obligation to provide additional easements to Austin Energy as set forth on the Plat(s) recorded under Document No(s). 200300180 and 200600328 of the Official Public Records of Travis County, Texas. (BOTH LOTS)
17. The terms, conditions and stipulations set out in that certain Subdivision Construction Agreement, recorded under Document No. 2003160154 of the Official Public Records of Travis County, Texas. (BOTH LOTS)
18. The terms, conditions and stipulations set out in that certain Declaration of Easements and Restrictive Covenants Regarding the Maintenance of Water Quality Controls for CR 108 Development dated July 9, 2003, recorded under Document No. 2003161381, and amended under 2014042420, of the Official Public Records of Travis County, Texas. (BOTH LOTS)
19. Drainage easement granted to the City of Austin, by instrument dated June 4, 2003, recorded under Document No. 2003160155 of the Official Public Records of Travis County, Texas and erroneously shown on Plat as Document No. 2003160154 of the Official Public Records of Travis County, Texas. (BOTH LOTS)
20. Electric and telecommunications easement 15 feet in width along the north and east property line(s), as shown by the Plat(s) recorded under Document No(s). 200300180 and 200600328 of the Official Public Records of Travis County, Texas. (BOTH LOTS)
21. Electric and telecommunications easement 10 feet in width along the southeast property line(s), as shown by the Plat(s) recorded under Document No(s). 200300180 and 200600328 of the Official Public Records of Travis County, Texas. (BOTH LOTS)
22. Location of drainage easements, water quality transition zones, critical water quality zones, critical environmental features and setbacks, as shown on Plat(s) recorded under Document No(s). 200300180 and 200600328 of the Official Public Records of Travis County, Texas. (BOTH LOTS)
23. Location of 15 foot dirt road traversing Property and rights of adjacent property to use as shown on survey dated August 16, 2011, prepared by George L. Sanders, Registered Professional Land Surveyor No. 1838.
24. Apparent easement evidenced by the location of utility poles and down guys outside of a dedicated easement as shown on survey dated August 16, 2011, prepared by George L. Sanders, Registered Professional Land Surveyor No. 1838.

{W0611924.2}

24. Apparent easement evidenced by the location of utility poles and down guys outside of a dedicated easement as shown on survey dated August 16, 2011, prepared by George L. Sanders, Registered Professional Land Surveyor No. 1838.

11-GFM 201101784 ALF
RETURN TO: HERITAGE TITLE
401 CONGRESS AVE., STE.1500
AUSTIN, TEXAS 78701

{W0611924.2}



FILED AND RECORDED
OFFICIAL PUBLIC RECORDS

Dana DeBeauvoir

DANA DEBEAUVOIR, COUNTY CLERK
TRAVIS COUNTY, TEXAS

March 26 2014 04:16 PM

FEE: \$ 74.00 2014042710

APPENDIX A4. CITY COUNCIL RESOLUTION (June 6, 2019)

RESOLUTION NO. 20190606-048

WHEREAS, Austin resident, William Hart (Bill) Russell's passing on March 21, 2019, has poignantly left a huge void in the world of caving; and

WHEREAS, Bill Russell was recognized as one of the most prolific cavers on the North American continent, being awarded a Certificate of Merit from the National Speleological Society, as well as made a Fellow of the Society and Honorary Member; and

WHEREAS, Bill Russell is credited with discovery, in 1966, of Sistema Huautla in the rugged mountains of Oaxaca, Mexico; considered one of the world's premier caves - so deep and extensive that it is still being explored today and is now known to be the deepest proven hydrological system in the western hemisphere and the eighth deepest in the world; and

WHEREAS, in these ongoing expeditions into the Huautla cave system, one of the passages that is expected to connect to the system is named "Bill Russell's Delight", being a 150-meter long, tight struggle with knife-like shredding blades of chert; and

WHEREAS, Bill Russell put his skills and passion to work at home reopening, mapping and preserving our local caves and was recognized by many as a brother, father, and grandfather figure within the caving community, mentoring and inspiring every cave scientist and cave digger working in Central Texas; and

WHEREAS, Bill Russell's work, along with the work done by those he mentored, contributed greatly to the discovery and protection of caves in the City of Austin and Wildlands Conservation Division; and

WHEREAS, many of the caves currently managed under the Balcones Canyonlands Conservation Plan required excavation for exploration due to deliberate and human-caused fill and Austin's rich heritage of protecting caves and associated wildlands for the preservation of water quality can be attributed to many people, but to no one more so than Bill Russell; and

WHEREAS, Bill Russell discovered the deep cave of Blowing Sink, digging through 12 feet of clay fill to reach Winter Woods cave and giving Blowing Sink its name because of the high rate of airflow blowing from its entrance; and

WHEREAS, Blowing Sink Cave provides the only known humanly accessible route to the water table within the Barton Springs Segment of the Edwards Aquifer; and

WHEREAS, the aquifer's ability to remain healthy and recharged with fresh water from rains and the viability of continuing spring flows depends on caves being open and not blocked or filled; and

WHEREAS, the Balcones Canyonland Conservation Plan (BCCP) federal permit issued to the City of Austin and Travis County in 1996 requires that the permit holders "acquire and manage or implement formal management agreements...adequate to preserve the environmental integrity of ...Blowing Sink"; and

WHEREAS, from 1997 to 2000, Bill Russell lobbied to have the land currently named Blowing Sink Research Management Area donated to the City of Austin as a preserve so that its rich recharge and cave treasures could be protected and further explored by local cavers; and

WHEREAS, the land will continue to use the given names for its features such as Blowing Sink Cave, Brownlee Cave, Sinky Dinky Cave, Sunspot Cave, Williams Well Cave, Winter Woods Cave, Jody Lane Cave and Wyoka Cave;

WHEREAS, the Watershed Protection Department has spent significant funds to open and stabilize several recharge features on the Blowing Sink Research Management Area and more work is needed to continue to open and maintain their function; **NOW, THEREFORE**,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

The City Manager is directed to initiate proceedings under City Code Section 14-1-39 for the renaming of the Blowing Sink Research Management Area to the William H Russell Karst Preserve.

BE IT FURTHER RESOLVED:

The City Manager is directed to coordinate Austin Water, the Parks and Recreation Department, and the Watershed Protection Department to collaboratively develop and establish a shared land management plan for the William H Russell Karst Preserve with the goal of protecting water quality, increasing recharge, protecting sensitive and endangered species habitat, and continuing the legacy of Bill H Russell's work on behalf of the City of Austin to further explore and document the City's karst resources with knowledgeable stakeholders in the community. The City Manager is directed to report back to Council on this land management plan by October 3, 2019.

BE IT FURTHER RESOLVED:

The City Manager is directed to develop a report on existing cave and karst feature enhancement or restoration projects and programs that have been

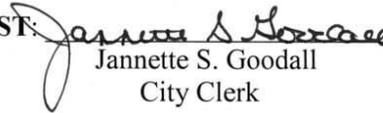
implemented or are in planning by Austin Water, the Parks and Recreation Department, and the Watershed Protection Department. The report should include potential opportunities for process improvements, regulatory considerations, additional water quality monitoring, guided public access, and best practices for engaging knowledgeable stakeholders in the community. The City Manager is directed to report back to Council on this report by January 2020.

BE IT FURTHER RESOLVED:

The City Manager is directed to develop a memorandum of understanding among Austin Water, the Parks and Recreation Department, and the Watershed Protection Department to address cave restoration and water quality monitoring related to caves on City-owned land. The City Manager is directed to report back to Council on this memorandum of understanding by March 1, 2020.

ADOPTED: June 6, 2019

ATTEST:


Jannette S. Goodall
City Clerk

APPENDIX B. HISTORICAL TIMELINE OF MAJOR MANAGEMENT EVENTS PERTAINING TO THE WILLIAM H. RUSSELL KARST PRESERVE

The following was revised from a draft CIP project report on restoration of five caves, dated July 2017.

- 12,000 years ago. Carbon dating of 12-foot deep sinkhole fill in Blowing Sink Cave entrance over the Main Pit, sampled at each foot interval, revealed fill as old as Pleistocene (12,070±70 years) and younger. Historically this period was a wet interval corresponding to post glacial period corresponding to a time of sediment fill in some other Central Texas caves such as Friesenhahn Cave in San Antonio.
- Pre 1984 - Overgrazed ranchland, erosion, possible intentional conversion of some sinkholes into stock ponds. Brownlee Cave was intentionally filled with rock possibly by adjacent pipeline operator. Caves like Williams Well (80 feet shaft), Wyoka, and Sinky Dinky (20 feet drop into room).
- April 1984 - Blowing Sink Cave was discovered by cave explorers Bill Russell and Nancy Weaver as a 10-inch-wide hole in a sink depression that blew air. Within a month of exploration with other cavers, the Main Pit was reached, allowing descent as far as Kirschberg Hall, or halfway down its known depth.
- June 1988 - Mike Grimm, Eli Grimm, Charley Savvas, and John Clark along with other cavers made major breakthrough to descend 190 feet below the surface at Liverpool Pit.
- 1989 - Wooden shoring was installed by Bill Russell through the breakdown in Blowing Sink Cave below Kirschberg Hall and Eileen's River and Dark Side of the Moon were discovered.
- Spring 1990 - Bill Russell and Julie Jenkins dug into a 40 feet diameter, 5 feet deep Sink-in-the-Woods sinkhole and encountered 80 feet deep shaft of Williams Well.
- 1991 - Two students were rescued by Austin Fire Dept. in the deep shaft of Blowing Sink Cave, unable to climb out. The sinkhole entrance of Blowing Sink was filled in with rocks by the property owner and a second entrance was discovered and concealed in the nearby powerline right of way. Bill Russell built wooden shoring and gates at Sinky Dinky, Sink in the Woods, and Brownlee Caves.
- 1993 - Bill Russell began digging 15-foot by 10-foot diameter depression that was one-foot deep, encountering Sinky Dinky Cave.
- 1995 - AISD considered the William H. Russell Karst Preserve for a future school site. William Russell and Nico Hauwert discovered North UMBERLAND passage while digging through rock plug below Kirschberg Hall. The passage below Kirschberg Hall to the lower level was reopened.
- 1996 - Bill Russell, Charley Savvas, Jodie Horton and Kevin Stafford encountered a 23 feet deep pit in Sinky Dinky Cave that descended into a large room.

- 1996-2003 - At the base of the pit in Williams Well Cave, Bill Russell, Julie Jenkins, Charley Savvas and Jody Horton excavated a narrow horizontal crawl for 130 feet.
- Fall 1996 -2002 Bill Russell and Julie Jenkins excavated Brownlee Cave of imported rock fill. Bill believed the main drain to the large sink was filled in northwest of Brownlee Cave on the Pipeline easement that was installed in the 1950's.
- August 1997 Bill Russell dug several test pits in Winter Woods Sink, which was 31 by 50 feet diameter and 6 inches deep.
- 1998 - Developer representative John Joseph retained environmental engineer Lauren Ross to advise them on how to build the Forum PUD development at higher density than allowed by SOS ordinance. Dr. Ross recommended finding a site of high environmental value to offer as mitigation. Developer attorney John Tarbox was advised by the Barton Springs/Edwards Aquifer Conservation District that the Blowing Sink tract was the most sensitive site not currently a preserve and was not being considered for acquisition under the Proposition 2 bonds for sensitive land acquisition. The Blowing Sink tract was being considered for a school site and there were real concerns considering Bowie High School across Slaughter Lane from Blowing Sink tract was actually built over a cave, as was McNeil High School and other schools during the 1990's. John Tarbox then offered to acquire the Blowing Sink tract and offered it to the City of Austin as mitigation for the Forum PUD development (now called Arbor Trails) at William Cannon and Mopac South. Unfortunately, other than a small group of cave explorers, few people were aware of the unusually high cave development across the site, so education about the tract required extensive effort.
- August 1999 - William Russell discovered Winter Woods Cave by digging 12 feet through clay in a subtle depression.
- 2000 - 160 acres of the William H. Russell Karst Preserve site was donated to the City of Austin as mitigation for additional development on the Forum PUD development on William Cannon at Mopac South and renamed Blowing Sink Research Management Area. In 2000 Longhorn Pipeline began to convert a gravity crude oil Exxon Pipeline into a pressured refined petroleum pipeline across the north portion of the preserve.
- Nov 2001 – Floodwaters washed in rocks that temporarily closed access below Kirschberg Hall to Eileen's River. Around this time, cattle were restricted from the site.
- 2004-2009 - Blowing Sink Cave Volunteer concrete shoring project, led by Bev Shade and David Ochel, with many caver volunteers including BCP biologist Mark Sanders, reopened the access to the lower portion of the cave and temporarily stabilized it.
- 2010 - Watershed Protection geologist Nico Hauwert and AW biologist Mark Sanders observed degradation and collapse of five unmaintained caves (Sinky Dinky, Williams Well, Wyoaka, Winter Woods, and Brownlee) and Nico applied for Capital Improvement Project funding to restore the caves.

- August 21, 2011 - A dive team composed of Dr. Jean Krejca , David Ochel, Mark Sanders, Galen Falgout, and Nico Hauwert explored the upstream sump in Eileens River.
- Sept.20, 2011 - TCEQ field office was notified of the proposed five cave restoration project and determined it to be maintenance in nature and exempt from Edwards Rules.
- Feb 3, 2012 - As part of a hydrogeological study to evaluate proposed Davis Lane realignment, a potassium bromide (KBr) tracer was injected into storm runoff entering Hideout Cave in Goat Cave Karst Nature Preserve and was detected about 3,000 feet south in the Balcony Drip of Blowing Sink Cave on February 7, 2012 (Bromide) and February 11, 2012 (potassium).
- Feb. 9, 2012 - A MIP team inspection of the five caves (Sinky Dinky, Williams Well, Wyoaka, Winter Woods, and Brownlee) on Blowing Sink Research Management Unit was conducted.
- Feb. 18, 2012 - 7 lbs. Direct Yellow 96 were injected into stormwater entering Sunspot Cave on the William H. Russell Karst Preserve as part of a hydrogeological study that was detected in Eileen’s River of Blowing Sink cave. Brownlee Cave appeared to be completely plugged and 7 pounds of tinopal tracer poured in a 4 feet deep pool around the entrance was not detected at any monitoring site.
- Dec 2012 - Initial Scope of Work- Recharge Structure Design and Implementation- CIP Project: Recharge Feature Maintenance Blowing Sink Preserve (Sinky Dinky, Williams Well, Wyoaka, Winter Woods, and Brownlee). The project involved removing sediment from the sinkholes using heavy machinery, installing concrete chimneys and cave gates to allow floodwaters to enter the caves, hiring a cave team to excavate sediment plugs inside the caves and map them, using the excavated sediment as sediment erosion control and surface restoration of eroded areas of the site, and revegetate with tree canopies and nutritious vegetation to enhance the cave ecosystem.
- Jan. 8, 2013 - Watershed Protection Dept hired 7 temporary cave staff (Bev Shade, David Ochel, Vivian Loftin, Justin Shaw, Galen Falgout, Heather Tucek, Don Brossard, and Christopher Franke with later replacements Guin McDade, Drew Thompson, Yazmin Avila, Lee Jay Graves, Jeff Nichols, David Comer, and Fernando Hernandez) and began work on in-cave restoration.
- April 4, 2013 - Zara Environmental LLC prepared a scope of work for the sinkhole restoration as requested. Bev Shade of Watershed Protection cave team mapped Williams Well (Sink in the woods 3/27-4/1/2013) and Sinky Dinky (4/2/2013).
- June 20, 2013 - City Council gave approval for City staff to enter into a contract with Zara Environmental LLC to stabilize the entrances of the five sinkholes on the basis of collapsing and plugging sinkholes from sediment influx, site sensitivity with strong hydraulic connection to Barton Springs, federal permit preserve for rare cave invertebrates, and rare salamanders, as well as public hazards from unsecured cave shafts.
- June 21, 2013 - Austin American Statesman reporter Farzad Mashood published an article on the project, its purpose, and cost.

- August 8, 2013 - Initial General Permit Notification and Innovative Runoff Management Practice Proposal were submitted for cave restoration at Sinky Dinky, Williams Well, Wyoaka, Winter Woods, and Brownlee Caves. Revised forms were resubmitted October 8, 2013, based on comments from Development Services.
- Aug 9, 2013 - Professional services contract was issued, but several weeks later, authorization for the vendor to work on the cave entrances was withdrawn, pending receipt of a Professional and Payment Bond. Because of the unique nature of the work and because the caves are permitted by the US Fish and Wildlife as environmentally sensitive, the vendor's agent was unable to find a surety that would write the bonds.
- September 20 - (3 inches of rainfall), September 29 (2 inches of rainfall), and especially Oct. 12, 2013 (8 inches of rainfall). Flood runoff bypassed plugged sinks and pummeled Blowing Sink Cave with runoff and boulders to the extent that the lower level of the cave has not been accessed since.
- October 10, 2013 - Certificate of Exemption was requested by Watershed Protection Department director for immediate procurement because if not immediately mitigated, the sediment influx into the unstable sinkholes in this federal permit area could cause extensive and expensive damage. In addition, the opening shafts created a public hazard potentially resulting in severe accidents, particularly since a high school is across the street and game cameras documented about 40 trespassers a year.
- November 5, 2013 - Quality Management division determined that engineer stamped plans were not required for the concrete risers that Zara proposed to install, allowing the contract to be completed.
- November 8, 2013 - The contract for Zara Environmental LLC was approved for surface restoration of four of the five caves.
- November 18, 2013 - Approval for the General Permit for the Zara restoration was received.
- November 20, 2013 - Significant initial unplugging of Sinky Dinky and Winter Woods was accomplished by Zara Environmental using a backhoe so that it could once again recharge. The sinks had to be completely excavated and stabilized as quickly as possible to reduce sediment from the sides falling into the cave where it must be manually removed. Concrete chimneys were installed in April 2014.
- December 10, 2013 to April 2014 - Brownlee Cave was manually excavated and excavated rock was used to create upstream rock berms.
- December 18, 2013 - An inspection by Watershed Protection groundwater team and engineer directed that sinkhole stabilization work stop until more traditional sediment and erosion controls that accompany typical development construction sites (rather than the innovative approaches proposed in the General Permit application) be implemented including silt fencing around excavated materials and limit of construction, limiting height of excavation piles, showing silt fencing on site plans, and tree protection. The Environmental Criteria Manual

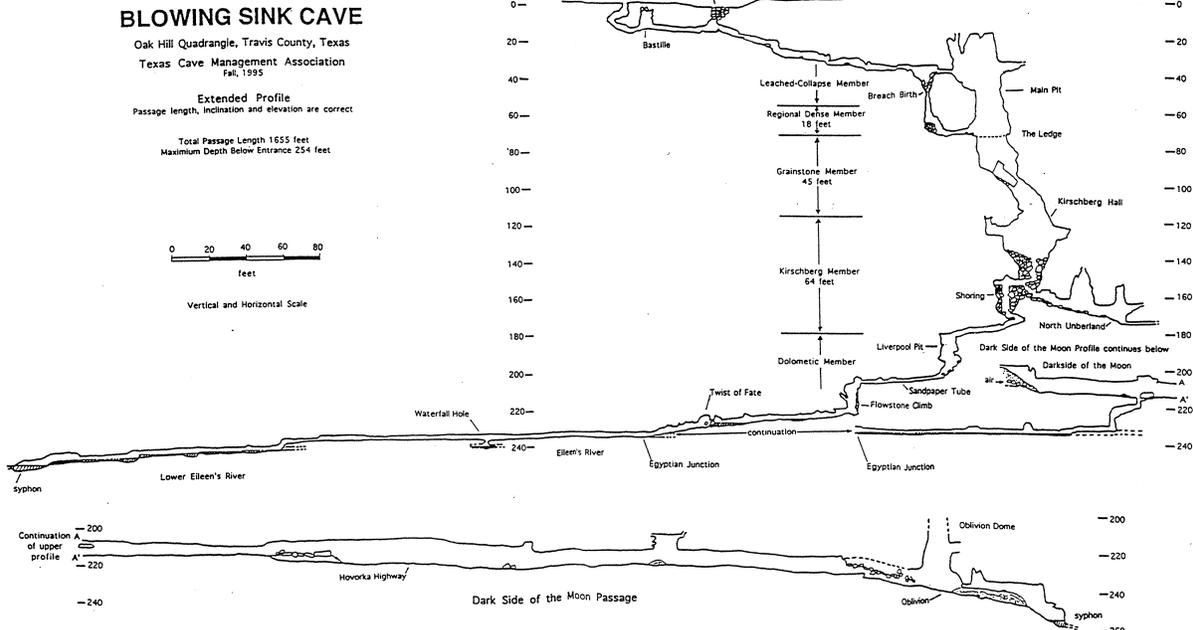
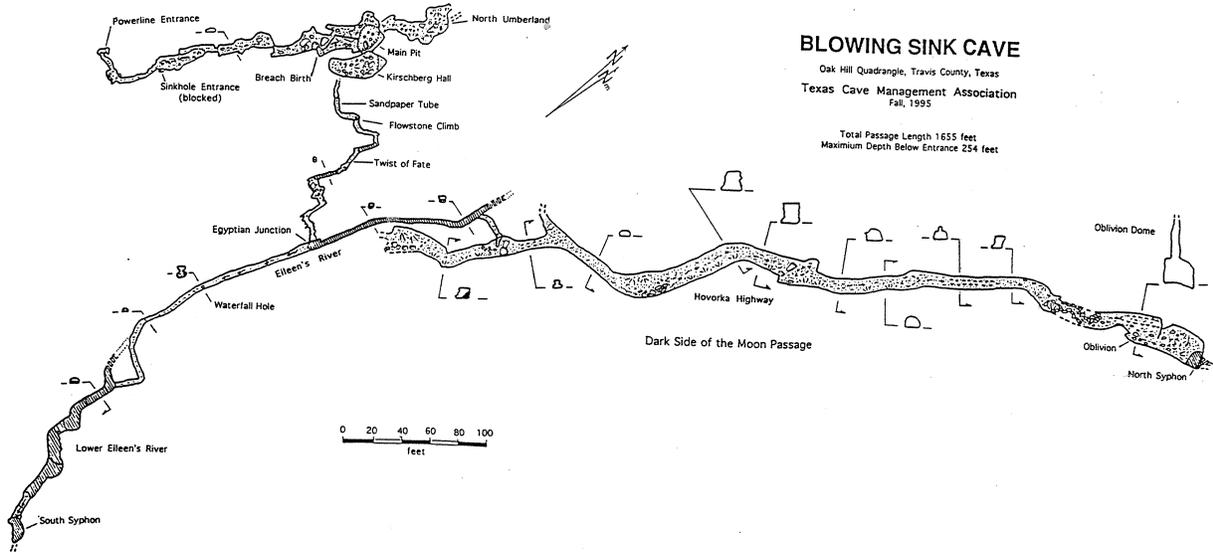
specified placement of silt fencing on the downstream end of construction (the sinkholes) and diverted floodwaters into the unsterilized sinks. Red imported fire ants were brought onsite through purchased mulch logs. The cave team was repurposed toward continuing manual excavation of Brownlee Cave and applying these controls for most of the remainder of the CIP project, leaving considerable sediment remaining in the project caves for a future project.

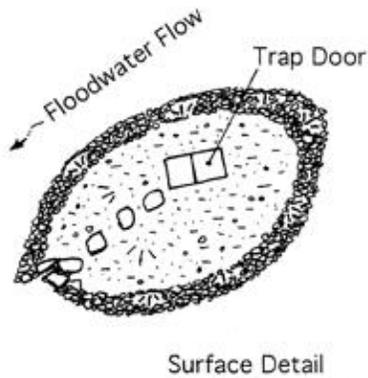
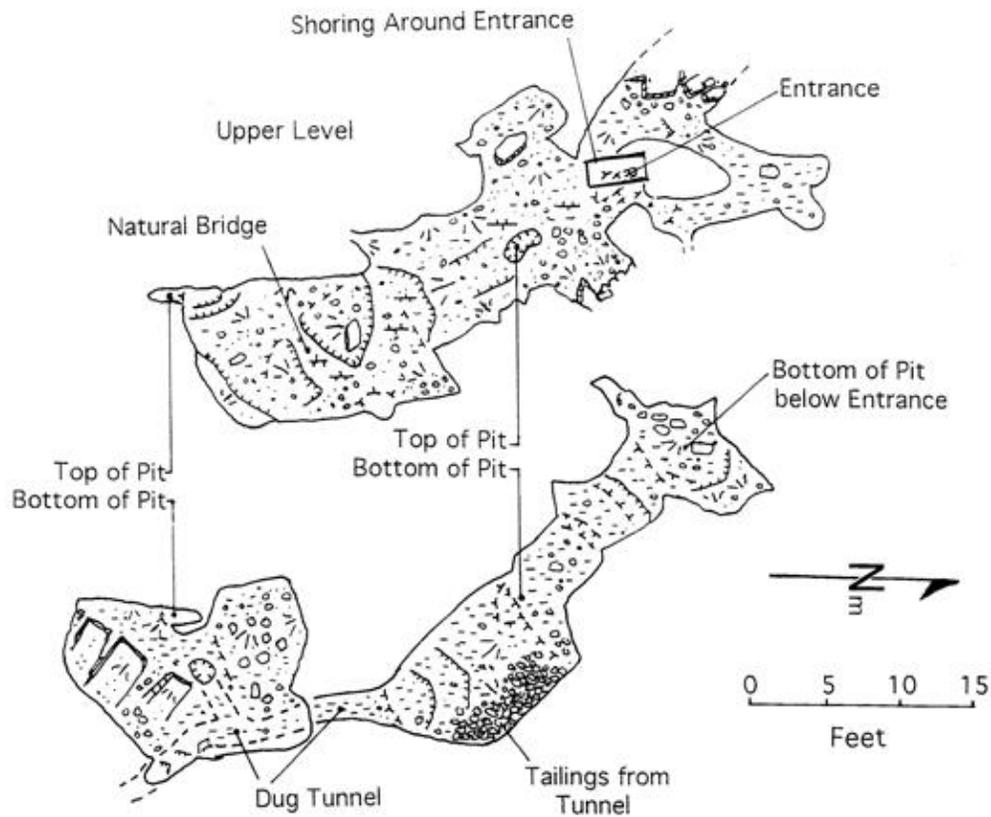
- Feb. 6 to 14, 2014 - Zara Env. excavated the sinkhole for Wyoaka Cave.
- Feb. 18, 2014 - PARD foresters installed mats to reduce compaction on portions of the access roads near Sink in the Woods and Winter Woods. They also mulched trees to make mulch berms for Wyoka Cave and Winter Woods.
- Feb 21, 2014 - Zara Env. began excavation on Sink in the Woods (Williams Well Cave) with a backhoe.
- March 13, 2014 - A tour of the sinks with Austin Fire Dept Lieutenant DJ Walker, and Watershed Safety Officers Pete Binon and Mike Millsap examined site safety, and provided familiarity of the site to AFD, to insure the site was prepared for emergency rescues.
- April 2014 - Watershed Protection cave team funding for the project was expended so in-cave excavation efforts were essentially ended before most of the accessible sediment was removed. They restored caves on other sites through 2015.
- April 25, 2014 - The Sinky Dinky Cave gate was completed by Charlie Savvas and inspected. Backhoe excavation of Sink in the Woods/Williams Well began.
- May 1, 2014 - The Blowing Sink barn was broken into and equipment was stolen.
- May 6, 2014 - The concrete chimney for Sink in the Woods was poured by Zara Environmental.
- May 22, 2014 - The Watershed Cave team and PARD rangers Trish Porter, Julie Webber, Mark Cusimano, John Nelson, and LaJuan Tucker returned to remove fill from Sinky Dinky.
- June 9, 2014 - Backhoe operator Rick Hudson, Hunter Denham, and Mark Sanders of Austin Water Wildlands Conservation arranged boulders around the rim of Brownlee Cave.
- June 22-24, 2014 - Contractor Zara Environmental found its tires slashed and a window was broken on a vehicle left on the site.
- June 25, 2014 - PARD Nature Preserves staff (Rene Barrera) discovered a recently used camp on the property and found an ATM from Austin Zoo.
- June 28 2014 - The Blowing Sink barn was broken into again. PARD Nature Preserves staff (Rene Barrera) found a wallet of one of the suspects with an identification card at the site. Game cameras installed by AW Wildlands Conservation photographed individuals crossing the areas.

- August 6, 2014 - APD arrested 2 suspects for burglary on the Blowing Sink tract and robbery of an ATM at Austin Zoo.
- August 18, 19, and 26, 2014 - Rick Hudson of Austin Water Wildlands Conservation moved boulders from Winter Woods and Sinky Dinky to form a rim around Brownlee Cave's sinkhole.
- September 1-25, 2014 - The Watershed Protection cave team returned to William H. Russell Karst Preserve under new funding to excavate Winter Woods Cave.
- Sept 26-27, 2014 - Cave team installed tree protection, 4 x 8 ft alterna-mats, and mulch for berms at Sinky Dinky.
- Sept 29, 2014 - Field Operations filled Sinky Dinky with cobbles. Watershed Protection Cave team excavated Wyoka Cave through October.
- October 6, 2014 - PARD notified that it had acquired a 25 acre acquisition south of the electric transmission line easement from AISD, bringing the site area from 165 acres to 190 acres.
- October 20, 2014 - Watershed Protection Field Operations filled Winter Woods with cobbles.
- Nov 24, 2014 - David Johns of Watershed Protection inspected Blowing Sink Research Management Unit and was concerned that chain link fence removed by Field Operations to access Wyoka and Sink in the Woods presented a public safety hazard to any trespassers and directed it to be reinstalled immediately.
- Nov 26-27, 2014 - Cave team reinstalled fencing at Sink in the Woods and Wyoka caves.
- Dec 1-4, 2014 - Cave team filled in Wyoka and Sink in the Woods with rocks from inside the caves.
- March 17-26, 2015 - AFD staff practiced cave rescues in Sinky Dinky with cave team assistance.
- Aug. 3-7, 2015 - After a one-year delay due to excessive wet ground and high priority flood response on other sites, Watershed Protection Dept. Field Operations Division staff returned and uses stored material from Wyoaka to fill ruts and build berms to divert runoff away from the East Road, and boulders to build retaining walls around the sink rim. They had only one week available and were not able to complete all heavy machinery work. Urgent needs elsewhere required their attention, so they were not available for any more help on this project.
- Sept 2015 - Mark Sanders of AW BCP discussed with Jenifer Leeper of Lower Colorado River Authority (LCRA) that LCRA could potentially use the soils excavated from the sinks on their restoration projects in other Balcones Canyonlands Preserve sites. LCRA contracts Paloma Blanca Enterprises of San Antonio removed remaining soil piles from both Blowing Sink Research Management Unit as well as other cave restoration sites. The contractors also helped move piles of rock from LaCrosse Cave at the Wildflower Center, and Grassy Cove Cave to help backfill Sink in the Woods. Irrigation was installed for seeding of Sinky Dinky.

- Oct. 20, 2015 - There was major sheet flow across whole site due to flooding. Minor sink rim collapse at Sinky Dinky, and erosion at Winter Woods. New berms were working, but got some new erosion on the road upstream.
- November 23, 2015 - A field trip for Balcones Canyonland Conservation staff, US Fish and Wildlife, and Watershed Protection Department, and Texas Commission on Environmental Quality staff was led to show cave restoration practices.
- June 30, 2016 - Vegetative Restoration installation was substantially complete, at 95% cover.
- June 2016-Fall 2018 – Maintenance Phase. Volunteers watered plants through the summers. CIP Project was terminated.
- August 4, 2017 - General permit notification form was submitted to Development Services for restoration of a less than 20 feet deep filled sinkhole overlying the Main Shaft in Blowing Sink Cave to allow rock obstruction removal.
- October 25, 2017 - General permit office approved proposed work as a maintenance exemption to general permit.
- December 2017-January 2018 - Contractor Charley Savvas excavated a 12 feet deep sinkhole to encounter the Main Shaft of Blowing Sink Cave. Further work to remove the obstruction necessitated an interdepartmental agreement with Austin Nature Preserves and regulatory clarity to allow non-destructive restoration of sensitive karst preserves that was required by federal permit.
- June 20-August 1, 2018 - Williams Well Cave. Rich Zarría, Mason Lewis, and Galen Falgout were contracted to remove sediment from a conduit 50-100 long that was needed to extend the cave over the footprint of Blowing Sink Cave, with the intention of connecting its currently inaccessible cave stream passage (Oblivion Dome), which is 65 feet laterally beyond the extent mapped by Bev Shade in 2014 and about 100 feet lower in elevation. Patti Calebrese accessed beyond the mapped portion to the furthest extent and found a descending pit. The connection was not accomplished by this effort and further work is needed.

APPENDIX C. CAVE MAPS





Winter Woods Cave

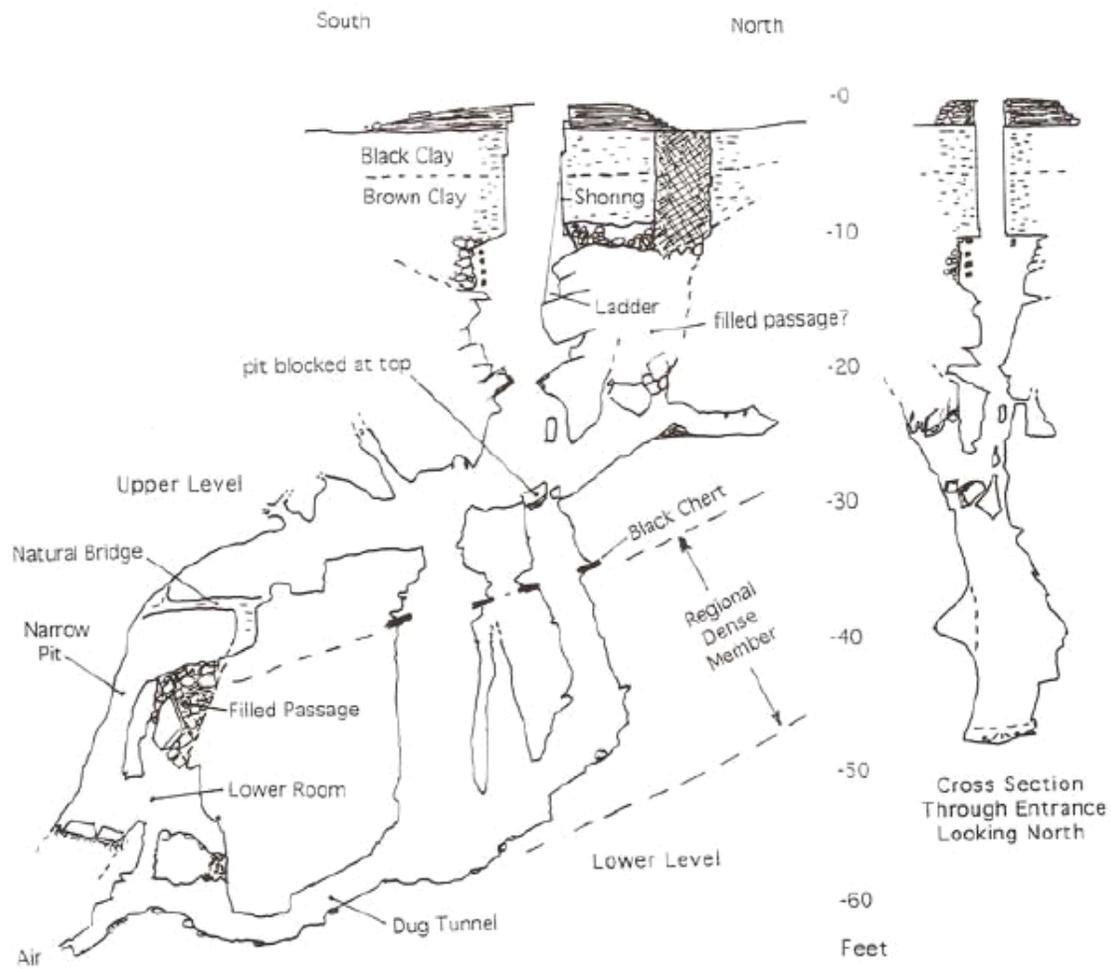
Travis County, Texas

Texas Cave Management Association

January, 2000

Suunto and Tape Survey by
Julie Jenkins, Bill Russell

Rock Movers
Craig Bittinger, Pat Bittinger
Jackie Bills, Julie Jenkins
Bill Russell



Projected Profile

Winter Woods Cave
Travis County, Texas

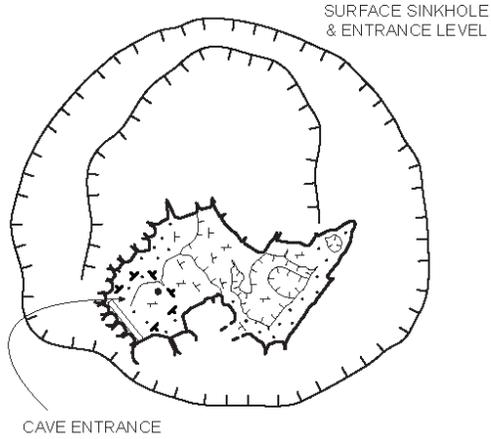
Russell and Jenkins
Texas Cave Management Association
January, 2000

PLAN VIEWS

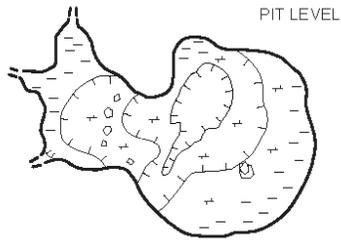
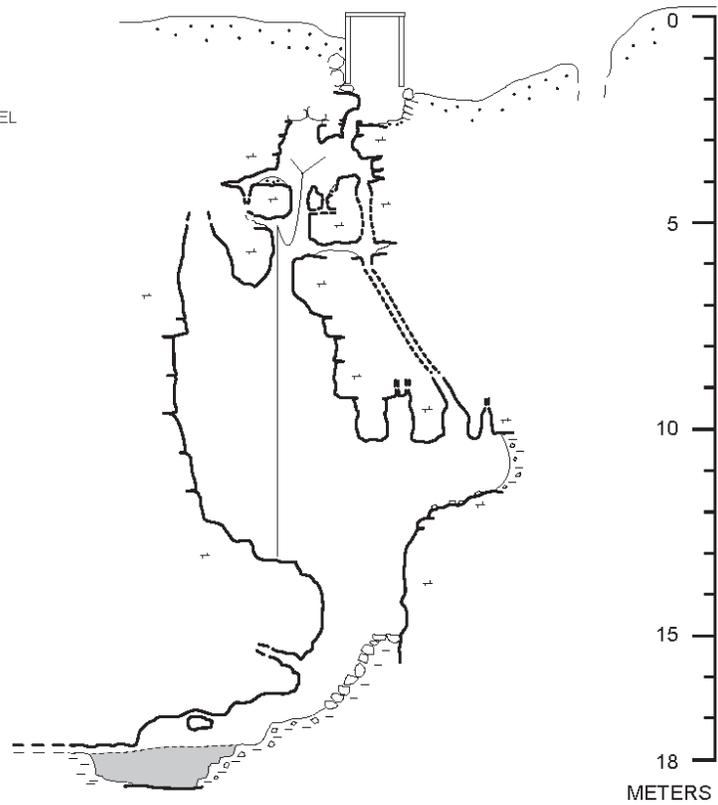
SINKY DINKY

Blowing Sink Preserve
Travis County, Texas

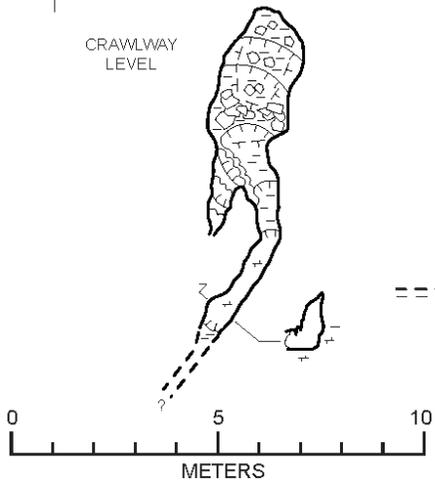
Surveyed length: 31 meters, depth: 18 meters
Suunto & disto survey 2 April 2013 by
Christopher Francke, Bev Shade
and Justin Shaw
Drafted by Bev Shade, April 2013
*excavated areas shown in gray
● = vertical reference

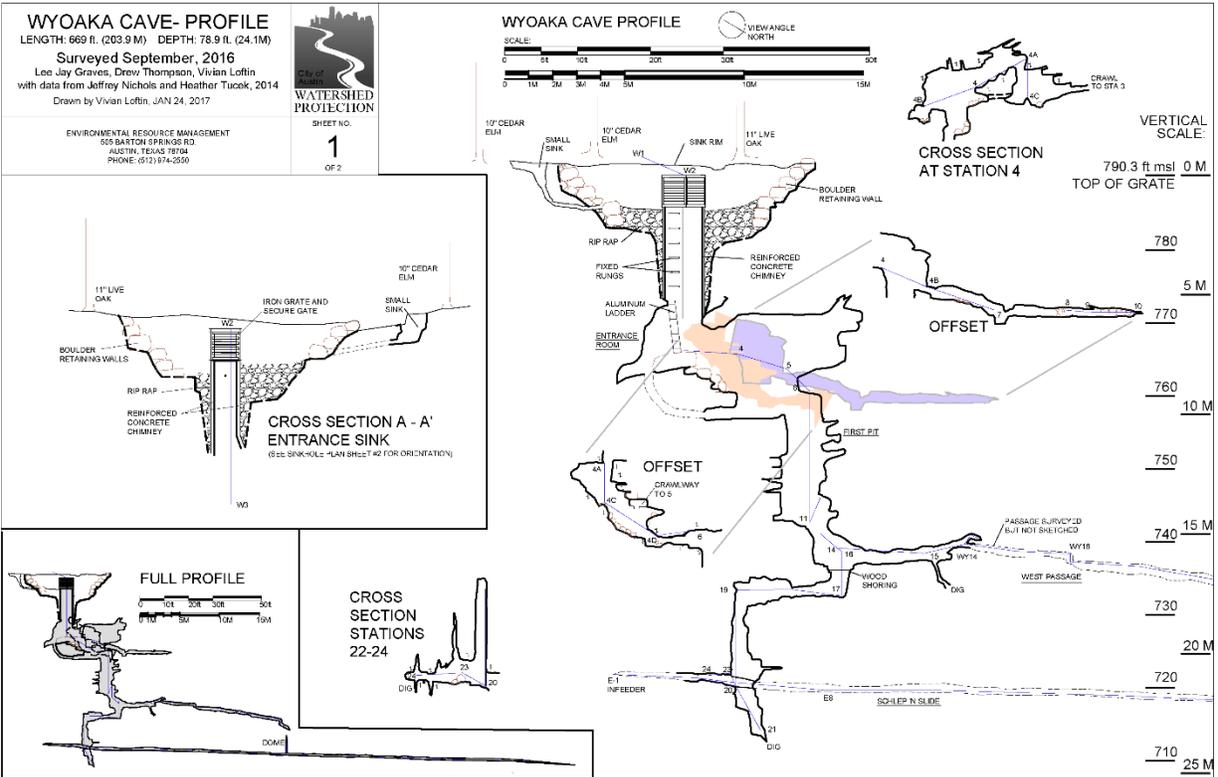
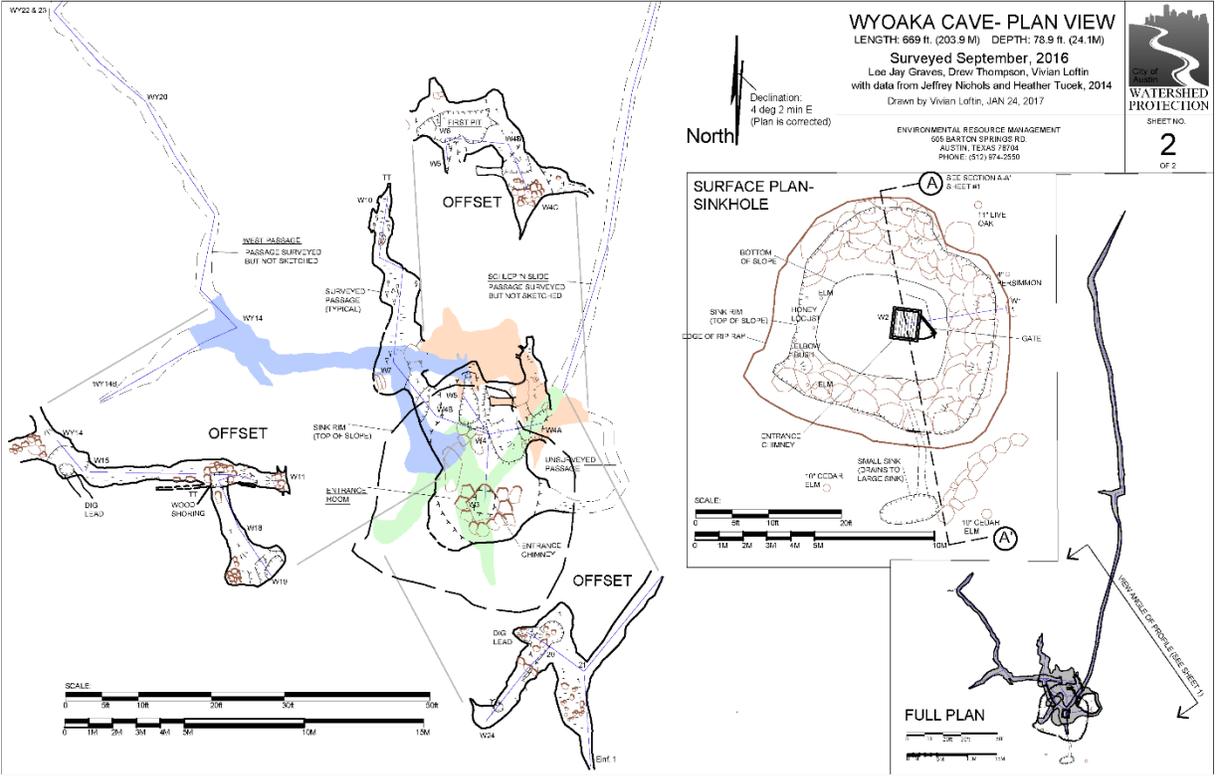


PROJECTED PROFILE: 240°

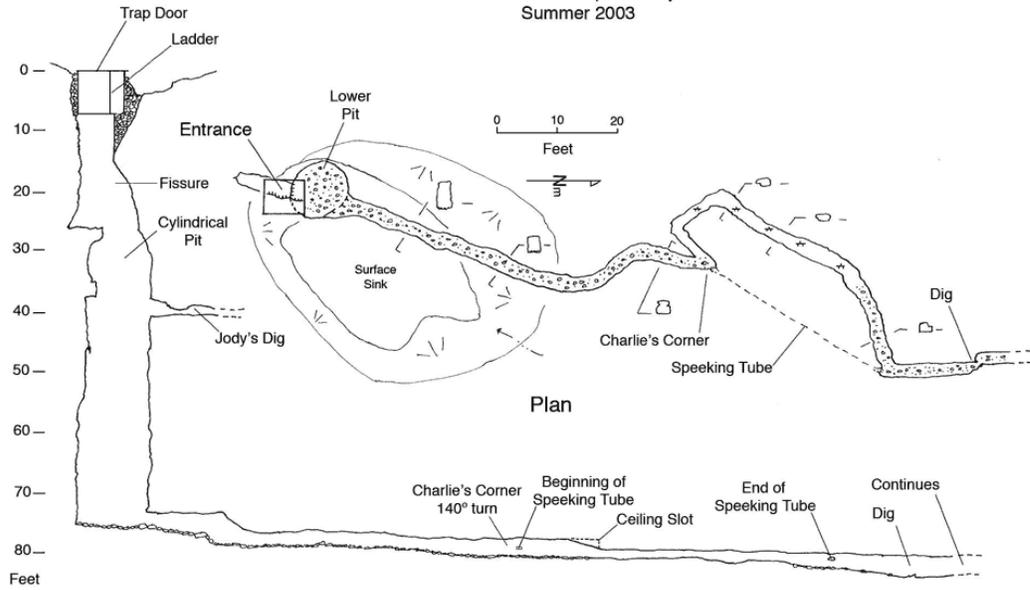


CRAWLWAY LEVEL





William's Well
 Travis County, Texas
 Julie Jenkins, Bill Russell
 Suunto and Tape Survey
 Summer 2003



Extended Profile

