



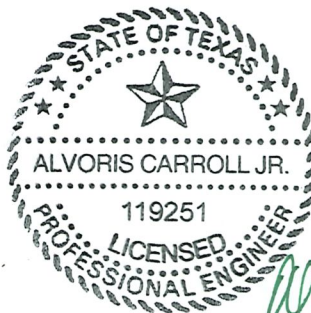
EDWARDS AQUIFER WATER POLLUTION ABATEMENT PLAN  
NATURE'S SYMPHONY RV PARK

2404 Ranch Road 12  
Hays County, Texas

Prepared August 25, 2024

ON BEHALF OF  
GUARRI GENERAL CONTRACTORS, LLC

Prepared by:



Revised: September 27, 2024

TRI-TECH ENGINEERING, LP  
155 RIVERWALK DRIVE  
SAN MARCOS, TX 78666  
TBPE FIRM REG. F-18693

---

10401 Westoffice Drive, Houston, Texas 77042  
P: 713-667-0800 F: 713-667-4262  
Tri-Tech Engineering, LP TBPE #F-18693  
Tri-Tech Surveying Co., LP TBPLS#10115900

155 Riverwalk Drive, San Marcos, Texas 78666  
P: 512-440-0222 F: 512-440-0224  
Tri-Tech Engineering, LP TBPE #F-18693  
Tri-Tech Surveying Co., LP TBPLS #10193729

## Texas Commission on Environmental Quality

# Edwards Aquifer Application Cover Page

---

### Our Review of Your Application

The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with [30 TAC 213](#).

### Administrative Review

1. [Edwards Aquifer applications](#) must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.  
  
To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: <http://www.tceq.texas.gov/field/eapp>.
2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.
3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.
4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.  
  
An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.
5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.
6. If the geologic assessment was completed before October 1, 2004 and the site contains "possibly sensitive" features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

### Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.
2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be



clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited.**
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

#### Mid-Review Modifications

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a "Mid-Review Modification". Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is denied/withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the affected jurisdictions.

Please contact the regional office if you have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ's Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ's San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

<b>1. Regulated Entity Name:</b> Nature's Symphony RV Park, LLC		<b>2. Regulated Entity No.:</b>			
<b>3. Customer Name:</b> Mark Harebottle		<b>4. Customer No.:</b>			
<b>5. Project Type:</b> (Please circle/check one)	<input checked="" type="radio"/> New	Modification		Extension	Exception
<b>6. Plan Type:</b> (Please circle/check one)	<input checked="" type="radio"/> WPAP	<input type="radio"/> CZP	<input type="radio"/> SCS	<input type="radio"/> UST	<input type="radio"/> AST
<b>7. Land Use:</b> (Please circle/check one)	<input type="radio"/> Residential	<input checked="" type="radio"/> Non-residential		<b>8. Site (acres):</b>	12.221
<b>9. Application Fee:</b>	\$6,500	<b>10. Permanent BMP(s):</b>		N/A	
<b>11. SCS (Linear Ft.):</b>	N/A	<b>12. AST/UST (No. Tanks):</b>		N/A	
<b>13. County:</b>	Hays	<b>14. Watershed:</b>		Upper San Marcos River	

## Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the "Texas Groundwater Conservation Districts within the EAPP Boundaries" map found at:

[http://www.tceq.texas.gov/assets/public/compliance/field\\_ops/eapp/EAPP%20GWCD%20map.pdf](http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf)

For more detailed boundaries, please contact the conservation district directly.

Austin Region			
County:	Hays	Travis	Williamson
Original (1 req.)	1	—	—
Region (1 req.)	1	—	—
County(ies)	1	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input checked="" type="checkbox"/> Barton Springs/Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input type="checkbox"/> Barton Springs/Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

San Antonio Region					
County:	Bexar	Comal	Kinney	Medina	Uvalde
Original (1 req.)	—	—	—	—	—
Region (1 req.)	—	—	—	—	—
County(ies)	—	—	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Trinity-Glen Rose	<input type="checkbox"/> Edwards Aquifer Authority	<input type="checkbox"/> Kinney	<input type="checkbox"/> FAA Medina	<input type="checkbox"/> FAA Uvalde
City(ies) Jurisdiction	<input type="checkbox"/> Castle Hills <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Helotes <input type="checkbox"/> Hill Country Village <input type="checkbox"/> Hollywood Park <input type="checkbox"/> San Antonio (SAWS) <input type="checkbox"/> Shavano Park	<input type="checkbox"/> Bolverde <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Garden Ridge <input type="checkbox"/> New Braunfels <input type="checkbox"/> Schertz	NA	<input type="checkbox"/> San Antonio ETJ (SAWS)	NA



I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.

Al Carroll, P.E.

Print Name of Customer/Authorized Agent

*Al Carroll*

*8/5/2024*

Signature of Customer/Authorized Agent

Date

**\*\*FOR TCEQ INTERNAL USE ONLY\*\***

Date(s) Reviewed:		Date Administratively Complete:	
Received From:		Correct Number of Copies:	
Received By:		Distribution Date:	
EAPP File Number:		Complex:	
Admin. Review(s) (No.):		No. AR Rounds:	
Delinquent Fees (Y/N):		Review Time Spent:	
Lat./Long. Verified:		SOS Customer Verification:	
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):
Core Data Form Complete (Y/N):			Signed (Y/N):
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):

# General Information Form

## Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge and Transition Zones and Relating to 30 TAC §213.4(b) & §213.5(b)(2)(A), (B) Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **General Information Form** is hereby submitted for TCEQ review. The application was prepared by:

Print Name of Customer/Agent: Al Carroll, P.E.

Date: 8/5/2024

Signature of Customer/Agent:



## Project Information

1. Regulated Entity Name: Nature's Symphony RV Resort, LLC
2. County: Hays
3. Stream Basin: Guadalupe River
4. Groundwater Conservation District (If applicable): Barton Springs/Edwards Aquifer
5. Edwards Aquifer Zone:
  - ☒ Recharge Zone
  - ☐ Transition Zone
6. Plan Type:
  - ☒ WPAP
  - ☐ SCS
  - ☐ Modification
  - ☐ AST
  - ☐ UST
  - ☐ Exception Request



7. Customer (Applicant):

Contact Person: Mark Harebottle

Entity: Nature's Symphony RV Resort, LLC

Mailing Address: 2010 Hoffman Lane

City, State: New Braunfels, Texas

Zip: 78312

Telephone: (512)856-0754

FAX: \_\_\_\_\_

Email Address: mark@guarrigeneralcontractors.com

8. Agent/Representative (If any):

Contact Person: Al Carroll

Entity: Tri-Tech Engineering LP

Mailing Address: 155 Riverwalk Dr.

City, State: San Marcos, Texas

Zip: 78666

Telephone: (512) 440-0222

FAX: \_\_\_\_\_

Email Address: acarroll@tritechtx.com

9. Project Location:

☐ The project site is located inside the city limits of \_\_\_\_\_.

☒ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of San Marcos

☐ The project site is not located within any city's limits or ETJ.

10. ☒ The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

11. ☒ **Attachment A – Road Map.** A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.

12. ☒ **Attachment B - USGS / Edwards Recharge Zone Map.** A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached. The map(s) clearly show:

☒ Project site boundaries.

☒ USGS Quadrangle Name(s).

☒ Boundaries of the Recharge Zone (and Transition Zone, if applicable).

☒ Drainage path from the project site to the boundary of the Recharge Zone.

13. ☒ **The TCEQ must be able to inspect the project site or the application will be returned.** Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☐ Survey staking will be completed by this date: \_\_\_\_\_

14. ☒ **Attachment C – Project Description.** Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:

- ☒ Area of the site
- ☒ Offsite areas
- ☒ Impervious cover
- ☒ Permanent BMP(s)
- ☒ Proposed site use
- ☒ Site history
- ☒ Previous development
- ☒ Area(s) to be demolished

15. Existing project site conditions are noted below:

- ☐ Existing commercial site
- ☐ Existing industrial site
- ☒ Existing residential site
- ☐ Existing paved and/or unpaved roads
- ☐ Undeveloped (Cleared)
- ☐ Undeveloped (Undisturbed/Uncleared)
- ☐ Other: \_\_\_\_\_

### ***Prohibited Activities***

16. ☒ I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:

- (1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
- (2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
- (3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;
- (4) The use of sewage holding tanks as parts of organized collection systems; and
- (5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).
- (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17. ☒ I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

- (1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);
- (2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and



- (3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

### ***Administrative Information***

18. The fee for the plan(s) is based on:

- ☒ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
- ☐ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
- ☐ For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
- ☐ A request for an exception to any substantive portion of the regulations related to the protection of water quality.
- ☐ A request for an extension to a previously approved plan.

19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

- ☐ TCEQ cashier
- ☒ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
- ☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

20. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

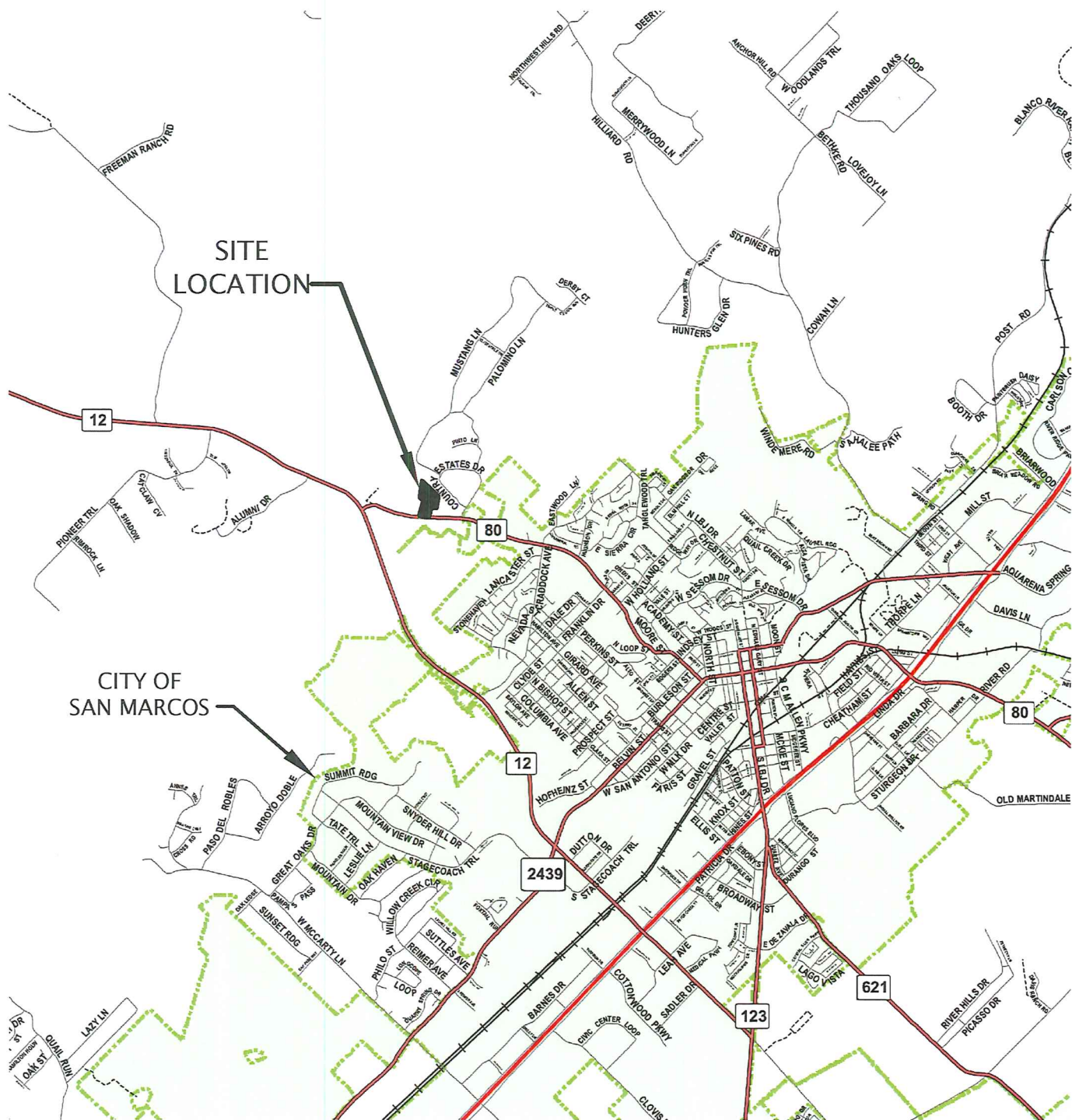
21. ☒ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

Nature's Symphony RV Park  
Water Pollution Abatement Plan

General Information  
Attachments

ATTACHMENT "A"  
Road Map





SCALE 1"=1 MILE

## TCEQ – General Information Form ATTACHMENT A

HAYS COUNTY ROAD MAP  
NATURE'S SYMPHONY RV PARK  
HAYS COUNTY, TEXAS

Hays County Road Map  
Hays County Development Services



**TRI-TECH**  
ENGINEERING, L.P.

155 RIVERWALK DRIVE  
SAN MARCOS, TEXAS 78666  
PH: 512-440-0222

TBPE REGIS. #: F-18693  
[www.tritechtx.com](http://www.tritechtx.com)

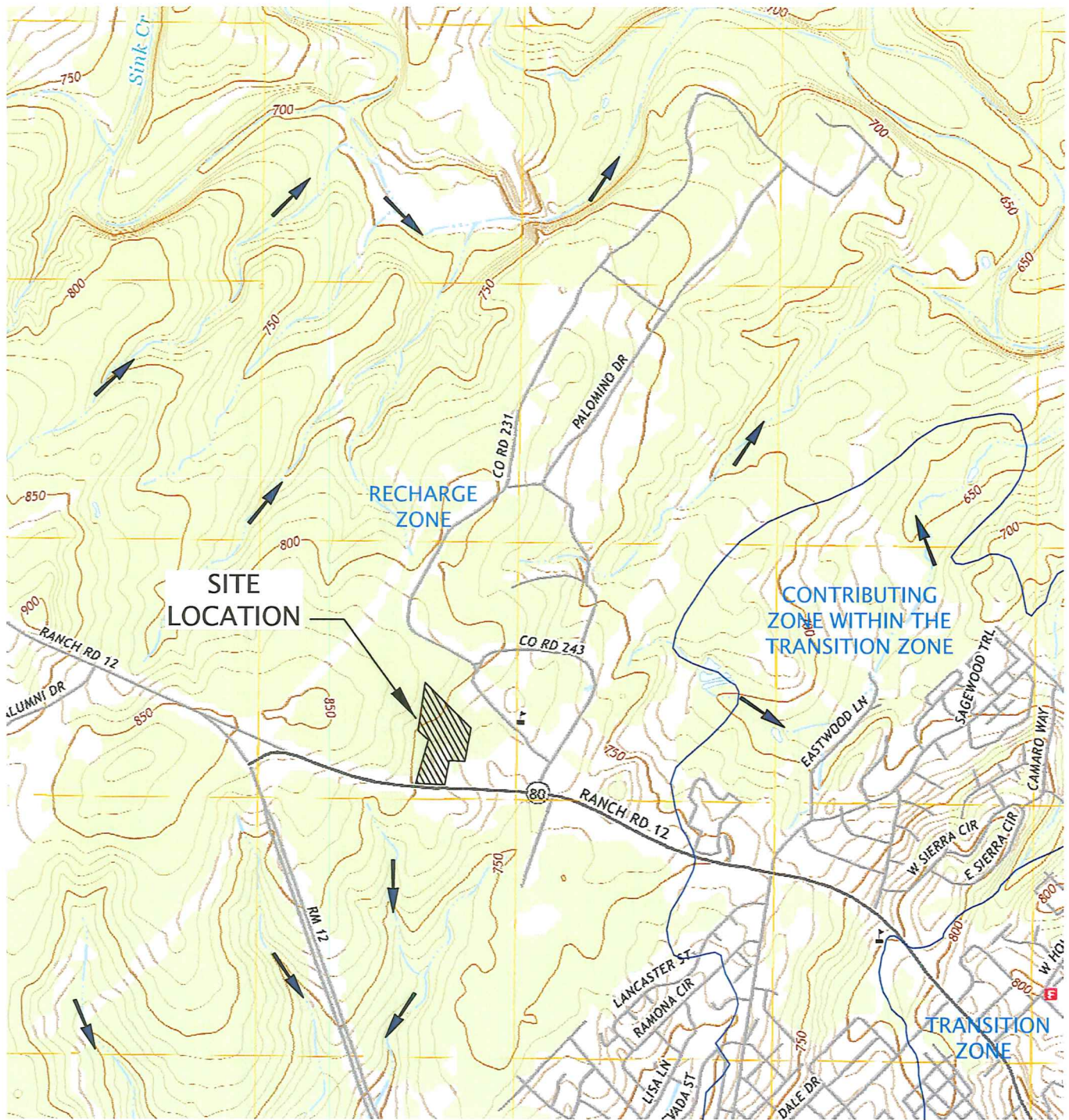
Nature's Symphony RV Park  
Water Pollution Abatement Plan

General Information  
Attachments

ATTACHMENT "B"

USGS Quadrangle Map





SCALE 1"=1000'

# TCEQ – General Information Form ATTACHMENT B

USGS TOPOGRAPHIC MAP  
NATURE'S SYMPHONY RV PARK  
HAYS COUNTY, TEXAS

2019 USGS, San Marcos North, Texas  
7.5 Quadrangle, 20 Foot Contours



## TRI-TECH ENGINEERING, L.P.

155 RIVERWALK DRIVE  
SAN MARCOS, TEXAS 78666  
PH: 512-440-0222

TBPE REGIS. #: F-18693  
[www.tritechtx.com](http://www.tritechtx.com)

**ATTACHMENT "C"**  
**Project Narrative**

**Attachment C**  
**Project Narrative**

The following is a description of the proposed improvements to be constructed for Nature's Symphony RV Park, Hays County, TX. Located 0.5 miles SE of the intersection of Ranch Road 12 and Old Ranch Road 12, approximately 0.8 miles NW of the intersection of Craddock and Old Ranch Road 12. This site is in the City of San Marcos ETJ.

The project site is 12.22 acres in the Lydia Glasgow Survey, Abstract 188 and Tract 2. This is currently unimproved pasture land.

This project consists of an Amenity Center, Leasing Office, Manager's Residence and Storage Building totaling 16,925 square feet (0.37 acres); Paved drives 60,058 square feet (1.38 acres), concrete flatwork and paved parking 10,618 square feet (0.24 acres), a swimming pool 600 square feet (0.01 acres) and RV sites 58,199 square feet (1.34 acres). The total impervious cover for the site is 145,770 square feet (3.35 acres) or 27.4% impervious cover. All of the buildings will be equipped for rain water harvesting which will reduce the effective impervious cover to 129,745 square feet 24.3%. The City of San Marcos will serve as the water source and an on-site septic sewage facility will serve for wastewater. The improvements will be serviced by an access drive from Old Ranch Road 12 on TXDOT right-of-way.

Channelization and berms will divert the offsite stormwater runoff around the proposed improvements. Grassy swales Bio retention ponds will be installed as permanent BMPs. All groundcover disturbed by construction activities will be re-vegetated.

Planned construction activities include:

- Installation of Temporary BMPs (silt fence, rock berm, concrete truck washout area, and stabilized construction entrance)
- Clearing and Grubbing: Removal of existing vegetation, top soil and other debris within the proposed construction site.
- Rough Grading: Cutting of proposed entrance drive, parking areas, building pads, access drive, drainage swales, and bio retention ponds.
- Site Grading: Grading of entrance drive, parking areas, drives, and building pads to prepare the subgrade for pavement and foundation.
- Pavement & Foundation: Installation of concrete foundations, parking, access drives, and entrance drive.
- Finished Grading: Final grading of drainage swales, slope grading, landscaping and installation of Permanent BMPs.
- Construction of building structures
- Utility Installation will be installed as part of the building construction for those structures that have utilities.

# Geologic Assessment

## Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: Andy G. Grubbs RS PG Telephone: 512 644-5361

Date: 12-18-2023

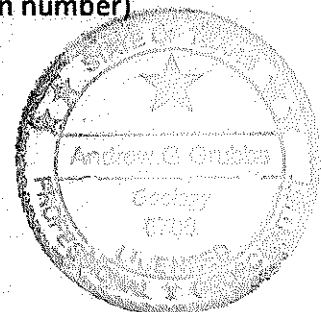
Fax: \_\_\_\_\_

Representing: \_\_\_\_\_ (Name of Company and TBPG or TBPE registration number)

Signature of Geologist: Hays Environmental Consulting PG #6708

Andy G. Grubbs RS PG

Regulated Entity Name: Nature's Symphony RV park



## Project Information

1. Date(s) Geologic Assessment was performed: 10-31-2023, 11-08-2023, 11-15-2023, 11-29-2023

2. Type of Project:

☒ WPAP  
☐ SCS

☐ AST  
☐ UST

3. Location of Project:

☒ Recharge Zone  
☐ Transition Zone  
☐ Contributing Zone within the Transition Zone



4. ☒ **Attachment A - Geologic Assessment Table.** Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.
5. ☒ Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups\* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

**Table 1 - Soil Units, Infiltration Characteristics and Thickness**

Soil Name	Group*	Thickness(feet)
Comfort - rock	C	16"
Rumple - Comfort	C	0-18"

**\* Soil Group Definitions (Abbreviated)**

- A. Soils having a high infiltration rate when thoroughly wetted.
- B. Soils having a moderate infiltration rate when thoroughly wetted.
- C. Soils having a slow infiltration rate when thoroughly wetted.
- D. Soils having a very slow infiltration rate when thoroughly wetted.

6. ☒ **Attachment B – Stratigraphic Column.** A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.
7. ☒ **Attachment C – Site Geology.** A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.
8. ☒ **Attachment D – Site Geologic Map(s).** The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'
 

Applicant's Site Plan Scale: 1" = 200 '

Site Geologic Map Scale: 1" = 200 '

Site Soils Map Scale (if more than 1 soil type): 1" = 600 '
9. Method of collecting positional data:
 

☒ Global Positioning System (GPS) technology.  
☐ Other method(s). Please describe method of data collection: \_\_\_\_\_
10. ☒ The project site and boundaries are clearly shown and labeled on the Site Geologic Map.
11. ☒ Surface geologic units are shown and labeled on the Site Geologic Map.

12. ☒ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
- ☐ Geologic or manmade features were not discovered on the project site during the field investigation.
13. ☒ The Recharge Zone boundary is shown and labeled, if appropriate.
14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.
- ☒ There are 2 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
- ☐ The wells are not in use and have been properly abandoned.
- ☒ The wells are not in use and will be properly abandoned.
- ☒ The wells are in use and comply with 16 TAC Chapter 76.
- ☐ There are no wells or test holes of any kind known to exist on the project site.

### ***Administrative Information***

15. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.



## Comments for the Geologic Assessment Table:

**F1:** This feature is a major displacement fault. It runs for 440' across the site at a varying trend which is overall about 30° the fault is expressed as small scarps with associated linear fractures and weathered limestone slabs. Due to the similar lithology of the strata here it is not possible to determine with great accuracy the amount of fault throw at this site. Located on the northwest corner of the property it runs from -97.9785; 29.9013 to -97.9777; 29.9023

**F2:** This feature is a minor displacement fault. It is expressed as a series of linear bedrock slabs and small scarps. The overall trend is about 45°. Located in the northwest portion of the tract it runs from -97.9784; 29.9010 to -97.9773; 29.9019


**F3:** This feature is major displacement fault. It is expressed as a series of linear bedrock slabs, scarps and a few exposures of weathered slickensides. The overall trend is about 30°. The unconformity at the Edwards 'Georgetown contact is located on the surface just east of this fault and shows that there is significant tilting down to the east of the strata here. Located across the middle of the tract it runs from -97.9785; 29.8995 to -97.9770; 29.9017

**F4:** This feature is a fault. It is expressed as a prominent scarp with rough bouldery Edwards limestone on the uphill side and soft, yellowish Georgetown formation on the lower side. Located on the eastern corner of the site it runs from -97.9768; 29.9768 to -97.9768; 29.9000

**W 1:** This feature is a water well with a associated windmill. It is presently not in use and will either be properly abandoned or brought back into proper working condition. Located at -97.9782; 29.9011

**W 2:** This feature is a water well for a residence that is lived in. It is presently in use and in proper working condition. Located at -97.9767; 29.9010

**S 3:** This feature is an abandoned septic tank from a former residence that is no longer present. It classifies as a manmade feature and will be properly abandoned. Any remaining liquids of contents will be pumped out / removed then the tank will be crushed in place then filled with well compacted high clay soil. Located at -97.9779; 29.9011

  
**ANDREW G. GRUBBS**  
**PROFESSIONAL GEOSCIENTIST # 6708**

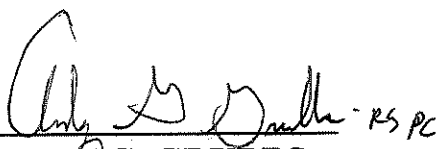


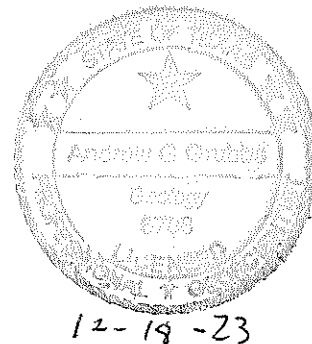
12-18-23

## Feature Location Table

All locations in WGS 84 projection

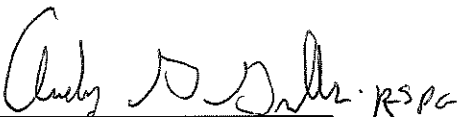
Feature ID	Lat	Long	Lat	Long
F1	29.9013	-97.9785	29.9023	-97.9777
F2	29.9010	-97.9784	29.9019	-97.9773
F3	29.8995	-97.9785	29.9017	-97.9770
F4	29.9000	-97.9768	29.9000	-97.9768
W1	29.9011	-97.9782		
W2	29.9010	-97.9767		
S1	29.9011	-97.9779		

  
**ANDREW G. GRUBBS**  
**PROFESSIONAL GEOSCIENTIST # 6708**



## **SITE SOILS**

The soils mapped on the site by the U.S. Soil Conservation Service are the Comfort-Rock and Rumble-Comfort soil series. Comfort-Rock soils of the Low Stony Hills Range Site are thin shallow rocky clays developed over hard limestones. They are generally found on gently undulating uplands. Rumble - Comfort soils are in the Gravelly Redland and Low Stony Hills range sites. They are dark cherty clay and clay loams, shallow to moderately deep on uplands of the Edwards Plateau Land Resource Area. At this location soils vary from around 14" to 24" in thickness. In general the soils are very dark brown to reddish brown clays. Visual inspection showed that most of area has very thin soils and prominent exposed bedrock pavements and rough karsted ledges. These soils have very slow percolation rates of 0.06- 0.2 inches/hour for the Comfort soils and slow percolation rates 0.2 -0.6 inches / hour for the Rumble.

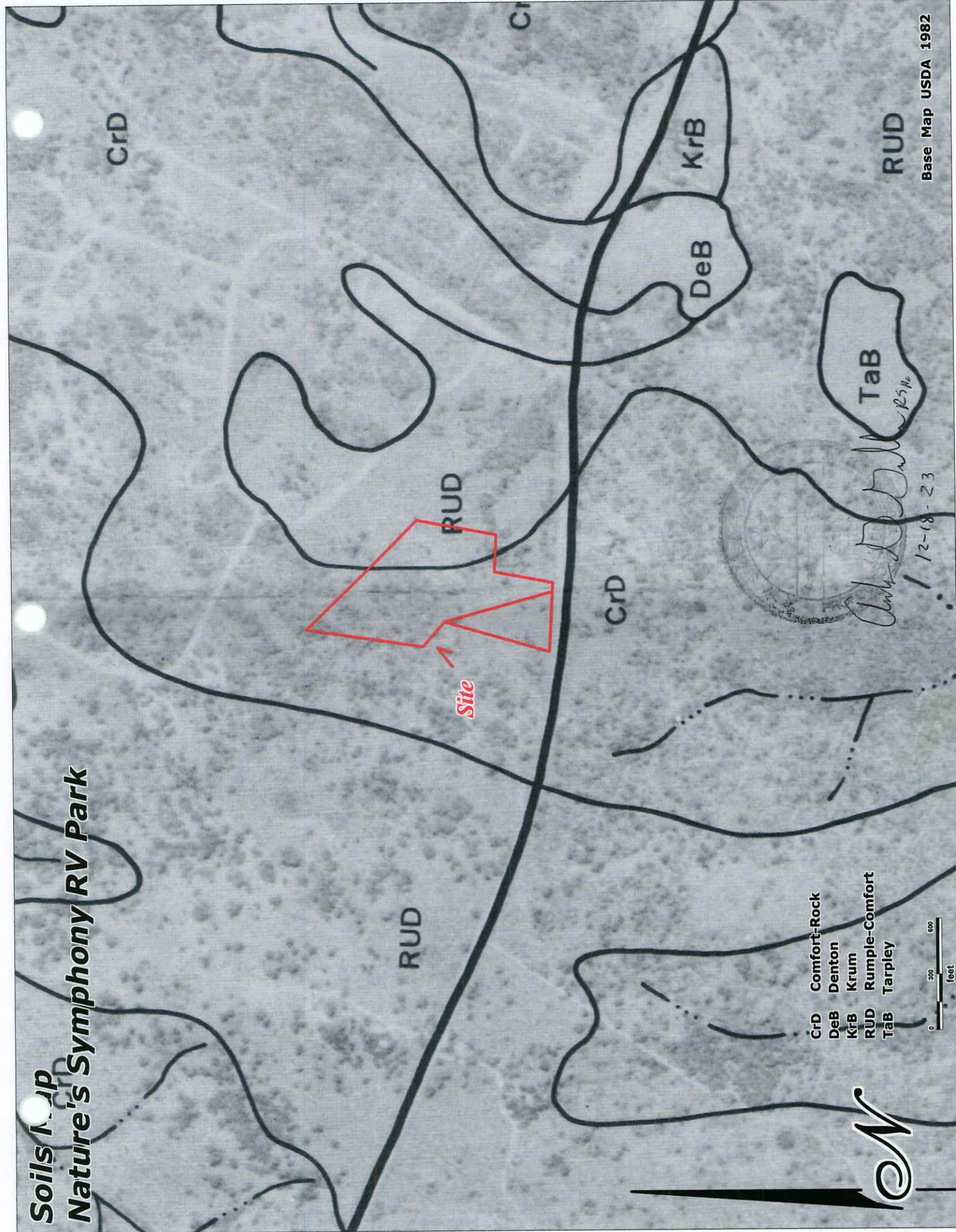
  
**ANDREW G. GRUBBS**  
**PROFESSIONAL GEOSCIENTIST # 6708**



12-18-23



# Soils Map Nature's Symphony RV Park



CrD Comfort-Rock  
DeB Denton  
KrB Krum  
RUD Rumple-Comfort  
TaB Tarpley

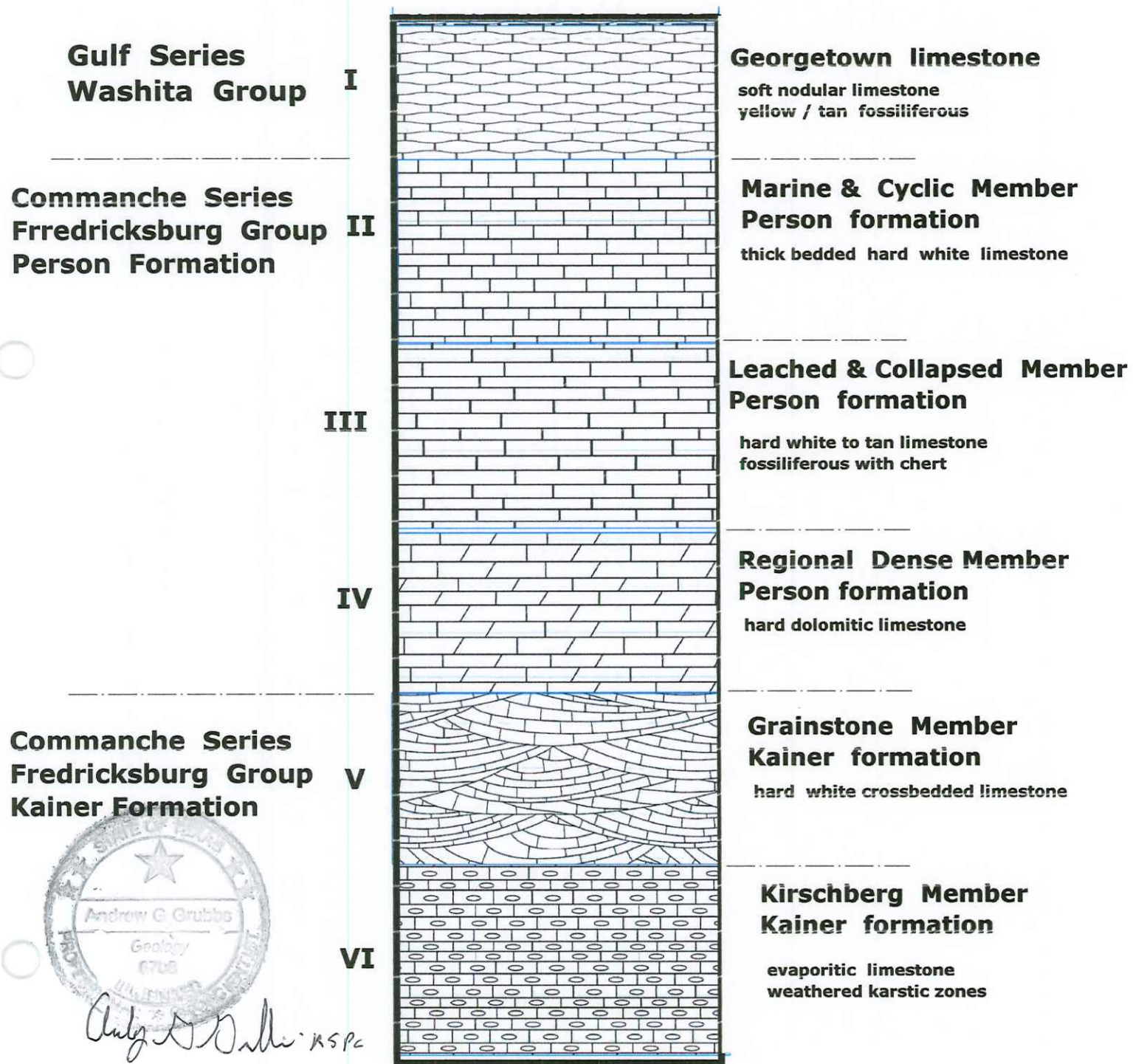
0 300 600  
feet



*Charles D. D... 12-18-23*



**Attachment B**  
**Stratigraphic Column**



## **Attachment C:**

### **SITE GEOLOGY:**

#### ***Structure***

This project area is 2 miles west of the eastern front of the Balcones Fault Zone. It lies on the western edge of the intensely faulted zone of San Marcos. The tract lies between major displacement faults. The Academy fault to the west and a unnamed major displacement fault to the east. The tract is traversed by several faults of undetermined displacement. Large scale Relay Ramp structures are present here but are not in evidence on the tract. Large scale tilting of strata is present. Georgetown limestone exposed on the surface in some areas but mainly the surface is Edwards limestones. The unconformity at the top of the Edwards / Georgetown contact is found. There are two major faults and several smaller step-down faults parallel to them. Rocks with small scarps, and eroded slickensides were found along various fault traces karst development along the fault planes is not extensive and well developed solution enlarged. Fractures were not found.

#### ***Stratigraphy***

Several geologists have mapped this area and do not agree as to member, formation or location of major displacement faults. Based on the exposures of the Georgetown formations the Edwards rocks exposed on the surface at this location are the top portion of the Person Formation. These are the Cyclic and Marine, and Leached and Collapsed members. Tilting of fault blocks in the San Marcos area can be pronounced and in this location it affects stratigraphic position of surface exposures. Local topography and observed lithology are consistent with the Marine & Cyclic and Leached & Collapsed members. The unconformity at the contact of the Edwards and overlying Georgetown formation can be found at several locations. Upland areas with Georgetown and Del Rio formation have contributed to soil cover that is thicker than average at places.

#### ***Lithology***

The lithology of the rock exposed on the surface varies from coarse grained vuggy recrystallized calcite spar to fine grained fossiliferous limestone. The rock is thick bedded and outcrops are of large rugged boulders, rough surfaced slabs and pavements. Moderate to shallow subtidal depositional environments are indicated. Most surface exposures are strongly solution etched. Honeycomb formed by preferential solution of burrowed beds is not extensive here but much small order vuggy porosity is. Original depositional porosity was enhanced by later diagenesis and the rock found on this site has a very coarse fabric of large spar crystals. Most of the porosity/permeability in this rock is a result of development of vugs and coarse grained recrystallization. Due to the tectonic history and setting between major faults fracture porosity is probably high

Water infiltrating in this area has a high potential to run along and across the faults and flow to San Marcos Springs located 2.7 miles to the east southeast.

The entire tract was surveyed using walking transects no greater than 50' apart and all potential recharge features were located and plotted on the site geologic map. No caves or major recharge

features were discovered during the surface survey.

Geologic studies specific to this area which were used as background include, Hill (1901) George (1948) Bills (1957) Noyes and Young (1960) DeCook (1960) Rose, P.R.(1972) Maclay and Small (1976) Grimshaw (1976) Collins, Baumgardner, and Raney (1991) Hanson and Small (1995) Hauwert and Hanson (1995) and Ahr (2008)

Ahr, W.M., 2008, *Geology of Carbonate Reservoirs: the identification, description, and characterization of hydrocarbon reservoirs in carbonate rocks*; John Wiley & Sons New Jersey, pp 277

Bills, T.V., Jr., 1957, *Geology of Waco Springs Quadrangle, Comal County, Texas*. University of Texas, Austin, Master's thesis 106 P.

Bluntzer R.L., 1992, *Evaluation of the Ground-Water resources of the Paleozoic and Cretaceous Aquifers in the hill country of central Texas*; Texas Water Development Board Report 339, 130p.

Collins, E.W., Baumgardner, R.W., Jr., and Raney, J. A., 1991 *Geologic map of the Wimberley quadrangle, Texas: the Univ of Texas, Austin, Bureau of Econ. Geo. Open-file map, scale 1:24,000*

DeCook, K.J., 1960 *Geology and ground-water Resources of Hays County, Texas*. Texas Board of Water Engineers Bull 6004, 170p

George, W.O., 1948, *Development of limestone reservoirs in Comal County, Texas*: American Geophysical Union trans, v29, 503-510

Grimshaw, T.W., 1976, *Environmental Geology of Urban and Urbanizing Areas: A Case Study From the San Marcos Area, Texas*: The University of Texas at Austin, Ph.D. dissertation, 244p.

Hanson, J.A., and Small, T.A., 1995, *Geologic framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Hays County, Texas*: U.S. Geological Survey Water Resources Investigations Report 95-4265

Hauwert, N.M., and J.A. Hanson 1995. *A look at the Hydrostratigraphic Members of the Edwards Aquifer in Travis and Hays Counties, Texas*. Guidebook 15, Austin Geologic Society 81p.

HILL, R. T. 1901. *Geography and Geology of the Black and Grand Prairies*. United States Geological Survey, 21st Annual Report, Part 7.

Lozo, E.F., Et Al., 1959. *Symposium on the Edwards Limestone in central Texas*: University of Texas, Bureau of Economic Geology Publication 5905, 235p.

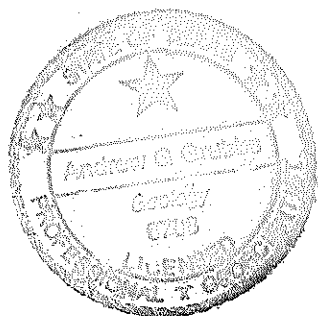
Maclay, R.W., and Small, T.A., 1976 Progress report on geology of the Edwards Aquifer, San Antonio area, Texas, and preliminary interpretation of borehole geophysical and laboratory data on carbonate rocks: U.S. Geological Survey Open-File Report 76-627, 65p.

Noyes, A.P., Jr. and Young, K.P., 1960, Geology of Purgatory Creek area, Hays and Comal Counties, Texas: Texas Jour. Sci., v.12 no1 & 2, p. 64-104

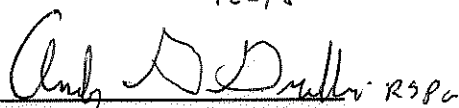
Rose, P.R. 1972, Edwards Group Surface and Subsurface, Central Texas University of Texas , Bureau of Economic Geology Report Inv. no 74. 198 p.

Stricklin, F.L., Jr., Smith, C.I., and Lozo, F.E., 1971, stratigraphy of Lower Cretaceous Trinity deposits of central Texas: Univ. Texas at Austin, Bur. Econ. Geology Rept. Inv. No. 71.

Senger, R.K., and Kreidler, C.W., 1984 Hydrogeology of the Edwards Aquifer, Austin area, central Texas: University of Texas , Bureau of Economic Geology Report Inv. no 141. 35p.



12-18-23

  
**ANDREW G. GRUBBS**  
**PROFESSIONAL GEOSCIENTIST # 6708**



# Attachment D Site Geologic Map

 water well

 Major Fault

 Minor fault

 Georgetown limestone

 Edwards limestones

Kp II Person formation  
Cyclic & Marine member

Kp III Person Formation  
Leached & Collapsed member

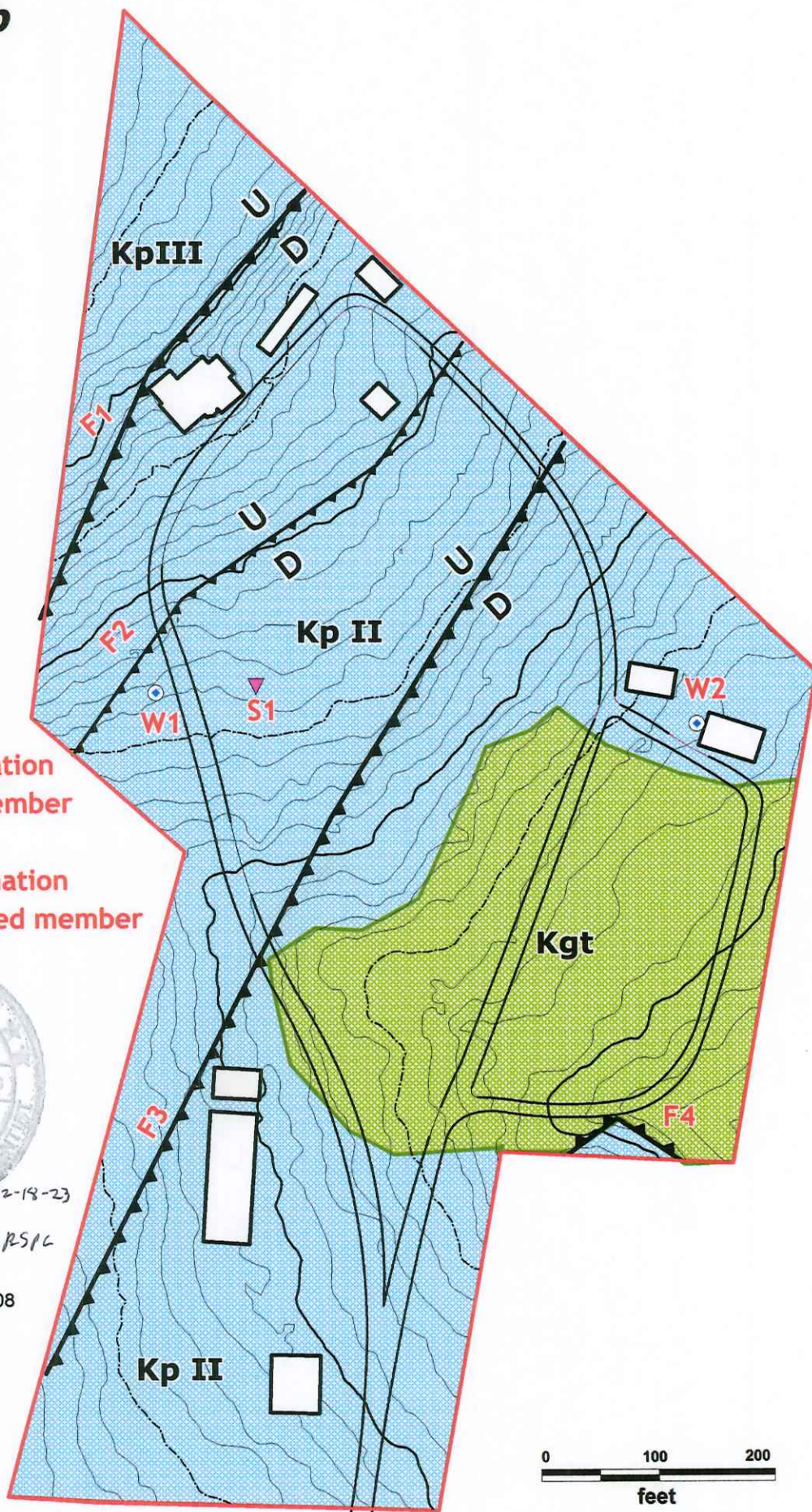


*Andrew G. Grubbs* 12-18-23  
RS16

ANDREW G. GRUBBS  
PROFESSIONAL GEOSCIENTIST # 6708

*Hays*

Hays  
Environmental  
Consulting

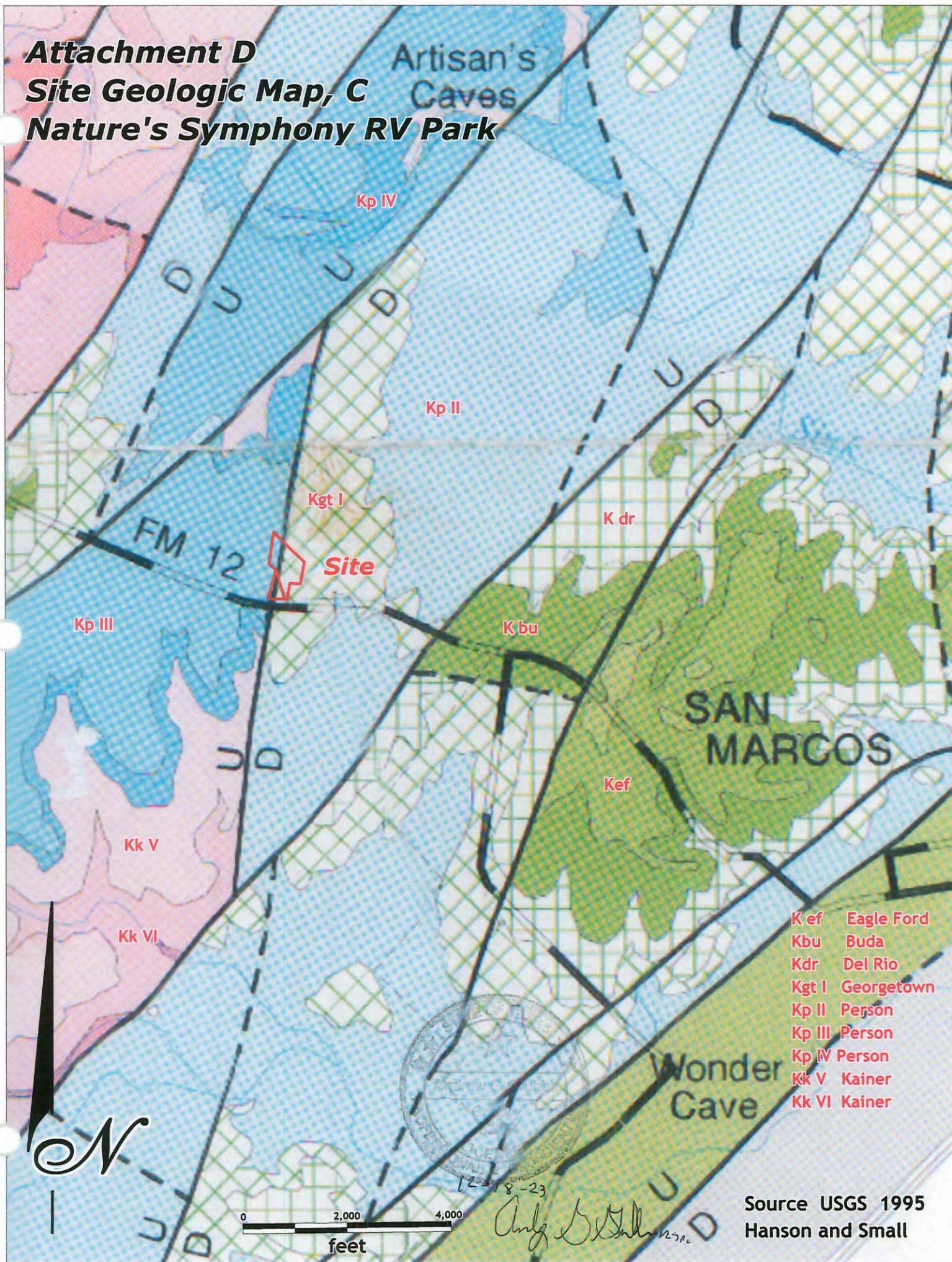


0 100 200  
feet

Topographic Contours based on  
LIDAR TNRIS 2017



**Attachment D**  
**Site Geologic Map, C**  
**Nature's Symphony RV Park**



K ef	Eagle Ford
Kbu	Buda
Kdr	Del Rio
Kgt I	Georgetown
Kp II	Person
Kp III	Person
Kp IV	Person
Kk V	Kainer
Kk VI	Kainer

Source USGS 1995  
Hanson and Small



**Attachent D**  
**Site Geologic Map, B**  
**Nature's Symphony RV Park**

Kep

795

**SITE**

Kep?

Kdr

Kgt

Kep?

RANCH RD 12

Kep

Kgt

Kep

Hays  
Environmental  
Consulting

Source  
Grimshaw 1976

*Andy D. Miller*  
12-18-23

0 400 800  
feet



# Water Pollution Abatement Plan Application

## Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b), Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

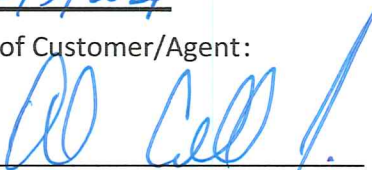
## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Water Pollution Abatement Plan Application Form** is hereby submitted for TCEQ review and Executive Director approval. The form was prepared by:

Print Name of Customer/Agent: Al Carroll, P.E.

Date: 8/5/2024

Signature of Customer/Agent:



Regulated Entity Name: Nature's Symphony RV Resort, LLC

## Regulated Entity Information

1. The type of project is:

- ☐ Residential: Number of Lots: \_\_\_\_\_
- ☐ Residential: Number of Living Unit Equivalents: \_\_\_\_\_
- ☐ Commercial
- ☐ Industrial
- ☒ Other: RV Park

2. Total site acreage (size of property): 12.221

3. Estimated projected population: N/A

4. The amount and type of impervious cover expected after construction are shown below:

**Table 1 - Impervious Cover Table**

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	8,106	$\div 43,560 =$	0.19
Parking	5,870	$\div 43,560 =$	0.13
Other paved surfaces	128,267	$\div 43,560 =$	2.94
Total Impervious Cover	142,243	$\div 43,560 =$	3.27

Total Impervious Cover 3.27  $\div$  Total Acreage 12.22  $\times 100 =$  26.7 % Impervious Cover

5. ☒ **Attachment A - Factors Affecting Surface Water Quality.** A detailed description of all factors that could affect surface water and groundwater quality that addresses ultimate land use is attached.
6. ☒ Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

### ***For Road Projects Only***

Complete questions 7 - 12 if this application is exclusively for a road project.

7. Type of project:

- ☐ TXDOT road project.
- ☐ County road or roads built to county specifications.
- ☐ City thoroughfare or roads to be dedicated to a municipality.
- ☐ Street or road providing access to private driveways.

8. Type of pavement or road surface to be used:

- ☐ Concrete
- ☐ Asphaltic concrete pavement
- ☐ Other: \_\_\_\_\_

9. Length of Right of Way (R.O.W.): \_\_\_\_\_ feet.

Width of R.O.W.: \_\_\_\_\_ feet.

$L \times W =$  \_\_\_\_\_  $\text{Ft}^2 \div 43,560 \text{ Ft}^2/\text{Acre} =$  \_\_\_\_\_ acres.

10. Length of pavement area: \_\_\_\_\_ feet.

Width of pavement area: \_\_\_\_\_ feet.

$L \times W =$  \_\_\_\_\_  $\text{Ft}^2 \div 43,560 \text{ Ft}^2/\text{Acre} =$  \_\_\_\_\_ acres.

Pavement area \_\_\_\_\_ acres  $\div$  R.O.W. area \_\_\_\_\_ acres  $\times 100 =$  \_\_\_\_\_ % impervious cover.

11. ☐ A rest stop will be included in this project.
- ☐ A rest stop will not be included in this project.

12. ☐ Maintenance and repair of existing roadways that do not require approval from the TCEQ Executive Director. Modifications to existing roadways such as widening roads/adding shoulders totaling more than one-half (1/2) the width of one (1) existing lane require prior approval from the TCEQ.

***Stormwater to be generated by the Proposed Project***

13. ☒ **Attachment B - Volume and Character of Stormwater.** A detailed description of the volume (quantity) and character (quality) of the stormwater runoff which is expected to occur from the proposed project is attached. The estimates of stormwater runoff quality and quantity are based on the area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

***Wastewater to be generated by the Proposed Project***

14. The character and volume of wastewater is shown below:

<u>100</u> % Domestic	<u>3,700</u> Gallons/day
<u>      </u> % Industrial	<u>      </u> Gallons/day
<u>      </u> % Commingled	<u>      </u> Gallons/day
TOTAL gallons/day <u>3,700</u>	

15. Wastewater will be disposed of by:

☒ On-Site Sewage Facility (OSSF/Septic Tank):

☐ **Attachment C - Suitability Letter from Authorized Agent.** An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.

☒ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

☐ Sewage Collection System (Sewer Lines):

☐ Private service laterals from the wastewater generating facilities will be connected to an existing SCS.

☐ Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.

☐ The SCS was previously submitted on \_\_\_\_\_.

☐ The SCS was submitted with this application.

☐ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

☐ The sewage collection system will convey the wastewater to the \_\_\_\_\_ (name) Treatment Plant. The treatment facility is:

- ☐ Existing.  
☐ Proposed.

16. ☐ All private service laterals will be inspected as required in 30 TAC §213.5.

### ***Site Plan Requirements***

***Items 17 – 28 must be included on the Site Plan.***

17. ☒ The Site Plan must have a minimum scale of 1" = 400'.

Site Plan Scale: 1" = \_\_\_\_\_'.

18. 100-year floodplain boundaries:

☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.

☒ No part of the project site is located within the 100-year floodplain.

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): \_\_\_\_\_

19. ☐ The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Lots, recreation centers, buildings, roads, open space, etc. are shown on the plan.

☒ The layout of the development is shown with existing contours at appropriate, but not greater than ten-foot intervals. Finished topographic contours will not differ from the existing topographic configuration and are not shown. Lots, recreation centers, buildings, roads, open space, etc. are shown on the site plan.

20. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):

☐ There are \_\_\_\_\_ (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply)

☐ The wells are not in use and have been properly abandoned.

☒ The wells are not in use and will be properly abandoned.

☐ The wells are in use and comply with 16 TAC §76.

☐ There are no wells or test holes of any kind known to exist on the project site.

21. Geologic or manmade features which are on the site:

☐ All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.

☒ No sensitive geologic or manmade features were identified in the Geologic Assessment.

☐ **Attachment D - Exception to the Required Geologic Assessment.** A request and justification for an exception to a portion of the Geologic Assessment is attached.



22. ☒ The drainage patterns and approximate slopes anticipated after major grading activities.
23. ☒ Areas of soil disturbance and areas which will not be disturbed.
24. ☒ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.
25. ☐ Locations where soil stabilization practices are expected to occur.
26. ☐ Surface waters (including wetlands).  
☒ N/A
27. ☐ Locations where stormwater discharges to surface water or sensitive features are to occur.  
☒ There will be no discharges to surface water or sensitive features.
28. ☒ Legal boundaries of the site are shown.

### ***Administrative Information***

29. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
30. ☒ Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

**ATTACHMENT "A"**

**Factors Affecting Surface Water Quality**

The only potential factors affecting water quality are from construction equipment leaks, refueling spills, as well as potential leaks from port-o-lets, and the total suspended solids (TSS) due to the construction activities on-site.

**ATTACHMENT "B"**

**Volume and Character of Stormwater**

This development proposes approximately 26.7% impervious cover and will utilize natural drainage channels to direct runoff to 2 bioretention ponds. These ponds and channels will act as buffer areas to surrounding property to filter sediment and other constituents which may be washed off roadway pavements. In addition, all natural drainage patterns will be maintained and erosion controls installed to minimize erosion due to flow concentration.

# Temporary Stormwater Section

## Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*


## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Temporary Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Al Carroll, P.E.

Date: 8/5/2024

Signature of Customer/Agent:

  
\_\_\_\_\_

Regulated Entity Name: Nature's Symphony RV Resort, LLC

## Project Information

### Potential Sources of Contamination

*Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.*

1. Fuels for construction equipment and hazardous substances which will be used during construction:

☐ The following fuels and/or hazardous substances will be stored on the site: \_\_\_\_\_

These fuels and/or hazardous substances will be stored in:

- ☐ Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

- ☐ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
- ☐ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.
- ☒ Fuels and hazardous substances will not be stored on the site.
- 2. ☒ **Attachment A - Spill Response Actions.** A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.
- 3. ☐ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
- 4. ☒ **Attachment B - Potential Sources of Contamination.** A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

### ***Sequence of Construction***

- 5. ☒ **Attachment C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.
  - ☐ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.
  - ☐ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.
- 6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: \_\_\_\_\_

### ***Temporary Best Management Practices (TBMPs)***

*Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. All structural BMPs must be shown on the site plan.*

- 7. ☒ **Attachment D – Temporary Best Management Practices and Measures.** TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information is attached:

- ☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.
  - ☒ A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.
  - ☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
  - ☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.
8. ☐ The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.
- ☐ **Attachment E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.
- ☒ There will be no temporary sealing of naturally-occurring sensitive features on the site.
9. ☒ **Attachment F - Structural Practices.** A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.
10. ☐ **Attachment G - Drainage Area Map.** A drainage area map supporting the following requirements is attached:
- ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.
  - ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.
  - ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.
  - ☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

- ☒ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.

11. ☐ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.

☒ N/A

12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.
13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.
14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

## ***Soil Stabilization Practices***

*Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.*

17. ☒ **Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices.** A schedule of the interim and permanent soil stabilization practices for the site is attached.



18. ☒ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.
19. ☒ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

### ***Administrative Information***

20. ☒ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.
21. ☒ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.
22. ☐ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

**ATTACHMENT "A"**  
**Spill Response Actions**

There will be no above ground storage tanks allowed on this project. Equipment will be fueled using mobile fuel trucks as needed. There is a small chance of a fuel spill occurring due to leaking construction equipment or refueling operations. The spill prevention and control measures described below, and included in Section 1.4.16 of RG-348 complying with the Edwards Aquifer Rules Technical Guidance Manual on Best Management Practices (July 2005), will be followed.

**Spill Prevention and Control**

The objective of this section is to describe measures to prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

The following steps will help reduce the stormwater impacts of leaks and spills:

***Education***

- (1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.
- (2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- (3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- (4) Establish a continuing education program to indoctrinate new employees.
- (5) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

***General Measures***

- (1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, and substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- (2) Store hazardous materials and wastes in covered containers and protect from vandalism.

Section

Contributing Zone Plan

(3) Place a stockpile of spill cleanup materials where it will be readily accessible.

(4) Train employees in spill prevention and cleanup.

(5) Designate responsible individuals to oversee and enforce control measures.

(6) Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn't compromise clean up activities.

(7) Do not bury or wash spills with water.

(8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMP's.

(9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.

(10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

(11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.

(12) Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

***Cleanup***

(1) Clean up leaks and spills immediately.

(2) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.

(3) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMP's in this section for specific information.

***Minor Spills***

(1) Minor spills typically involve small quantities of oil, gasoline, paint, etc, which can be controlled by the first responder at the discovery of the spill.

- (2) Use absorbent materials on small spills rather than hosing down or burying the spill.
- (3) Absorbent materials should be promptly removed and disposed of properly.
- (4) Follow the practice below for a minor spill:
- (5) Contain the spread of the spill.
- (6) Recover spilled materials.
- (7) Clean the contaminated area and properly dispose of contaminated materials.

### ***Semi-Significant Spills***

Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

Spills should be cleaned up immediately:

- (1) Contain spread of the spill.
- (2) Notify the project foreman immediately.
- (3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter, and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
- (4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
- (5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

### ***Significant/Hazardous Spills***

For significant or hazardous spills that are in reportable quantities:

- (1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
- (2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110, 119, and 302, the contractor should notify the National Response Center at (800) 424-



- (3) Notification should first be made by telephone and followed up with a written report.
- (4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
- (5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at: [https://www.tceq.texas.gov/response/spills/spill\\_rq.html](https://www.tceq.texas.gov/response/spills/spill_rq.html)

### ***Vehicle and Equipment Maintenance***

- (1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- (2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately
- (3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- (4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- (5) Place drip pans or absorbent materials under paving equipment when not in use.
- (6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- (7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- (8) Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
- (9) Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

### ***Vehicle and Equipment Fueling***

- (1) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.

(2) Discourage "topping off" of fuel tanks.

(3) Always use secondary containment, such as a drain pan, when fueling to catch spills, leaks.

#### **ATTACHMENT "B"**

##### **Potential Sources of Contamination**

The only potential sources of contamination are construction equipment leaks, refueling spills, potential leaks from port-o-lets, and the total suspended solids (TSS) due to the construction activities on-site. There are no other anticipated potential sources of contamination.

#### **ATTACHMENT "C"**

##### **Sequence of Major Activities**

Stages of Construction:

1. Installation of Temporary BMP's (Silt Fence, Rock Berm, and Stabilized Construction Entrance)
2. Clearing and Grubbing: Removal of existing vegetation, top soil and other debris within the proposed construction site. Approximate total disturbed area = 2.82 acres
3. Rough Grading: Cutting of proposed entrance drive, parking areas, building pads, access drive, and drainage swales. Approximate total disturbed area = 2.82 acres
4. Utility Installation: Trenching and installation of water and wastewater utilities. Approximate total disturbed area = 0.3 acres.
5. Site Grading: Grading of entrance drive, parking areas, and building pads to prepare the subgrade for pavement and foundation. Approximate total disturbed area = 0.91 acres.
6. Pavement & Foundation: Installation of concrete foundations, parking, access drive, and entrance drive. Approximate total disturbed area = 1.27 acres.
7. Finished Grading: Final grading of drainage swale, slope grading, and landscaping and installation of permanent BMP's. Approximate total disturbed area = 3.9 acres
8. Completion of Construction: Installation of all landscaping and replacement of destroyed vegetation. Once permanent growth of vegetation has occurred remove temporary BMP's (Silt Fence & Rock Berm).

The project site is located in the Colorado River drainage basin. Drainage from the site will travel approximately 500 feet to Cambrian Creek then approximately 3 miles down Barton Creek then approximately 32 miles to its confluence with the Colorado River.

#### **ATTACHMENT "D"**

##### **Temporary BMP's and Measures**

The following sequence will be followed for installing temporary BMP's:

1. Building pad, parking, drainage swale, entrance drive, utilities (water & wastewater), and access drive location will be located/surveyed. (No soil disturbance.)
2. Silt fence and rock berms will be constructed on the downgradient side of proposed construction site prior to beginning clearing and construction operations.

## Section

## Contributing Zone Plan

3. Stabilized construction entrance will be established at proposed entrance drive.

A. Any upgradient surface water entering this site will be handled by Temporary BMP's (Silt Fence & Rock Berm).

B. Silt fence will be placed on the downgradient side of proposed improvements to contain pollutants generated from onsite runoff. Material from excavation will be placed upstream of the silt fence to reduce the potential of sediment reports.

Rock berms will be placed on the down gradient end of channelized drainage locations to contain pollutants generated from onsite runoff.

Soil disturbance will be limited to a minimal distance outside the proposed pavement and landscaping footprint. Disturbed areas will be seeded to replace destroyed vegetation. The existing vegetation located downgradient of each proposed improvement will help to prevent pollution of water originating onsite and/or flowing offsite.

There were sensitive geological features discovered on the project during the field investigation. They are identified as C1 (30' diameter cave) and SC1 (12" x 10" solution cavity) in the geological assessment table. A temporary diversion dike can be placed upstream of the sensitive features to route runoff around the sensitive features.

**Materials:**

- (1) Stone stabilization (required for velocities in excess of 6 fps) should consist of riprap placed in a layer at least 3 inches thick and should extend a minimum height of 3 inches above the design water surface up the existing slope and the upstream face of the dike. Stabilization riprap should conform to the following specifications:

**Channel Grade Riprap Stabilization:**

- 0.5 – 1% 4 inch rock
- 1.1 – 2% 6 inch rock
- 2.1 – 4 % 8 inch rock
- 4.1 – 5% 8 – 12 inch riprap

- (2) Geotextile fabric should be a non-woven polypropylene fabric designed specifically for use as a soil filtration media with an approximate weight of 6 oz./yd<sup>2</sup>, a Mullen burst rating of 140 psi, and having an equivalent opening size (EOS) greater than a #50 sieve.

**Installation:**

- (1) Diversion dikes should be installed prior to and maintained for the duration of construction and should intercept no more than 10 acres of runoff.
- (2) Dikes should have a minimum top width of 2 feet and a minimum height of compacted fill of 18 inches measured from the top of the existing ground at the upslope toe to top of the dike and having side slopes of 2:1 or flatter.
- (3) The soil for the dike should be placed in lifts of 8 inches or less and be compacted

**Section****Contributing Zone Plan**

to 95 % standard proctor density.

(4) The channel, which is formed by the dike, must have positive drainage for its entire length to an outlet.

(5) When the slope exceeds 2 percent, or velocities exceed 6 feet per second (regardless of slope), stabilization is required. Situations in which velocities do not exceed 6 feet per second, vegetation may be used to control erosion.

**Inspection and Maintenance Guidelines:**

(1) Swales should be inspected weekly and after each rain event to determine if silt is building up behind the dike or if erosion is occurring on the face of the dike.

Locate and repair any damage to the channel or clear debris or other obstructions so as not to diminish flow capacity.

(2) Silt should be removed in a timely manner to prevent remobilization and to maintain the effectiveness of the control.

(3) If erosion is occurring on the face of the dike, the slopes of the face should either be stabilized through mulch or seeding or the slopes of the face should be reduced.

(4) Damage from storms or normal construction activities such as tire ruts or disturbance of swale stabilization should be repaired as soon as practical.

**ATTACHMENT "E"****Request to Temporarily Seal a Feature**

There will be no request to temporarily seal a feature.

**ATTACHMENT "F"****Structural Practices**

Silt fence will be used to protect disturbed soils and to prevent contamination from leaving the project site and rock berms will be used at areas of channelized drainage leaving the project site. The majority of the site will remain in a natural condition with minimal impacts to existing drainage paths; therefore, natural filtration will be allowed to occur.

**ATTACHMENT "G"****Drainage Area Map**

See Drainage Area Map included in Construction Plans.

**ATTACHMENT "H"****Temporary Sediment Pond Plans and Calculations**

Due to the small scale of the site and the minor soil disturbance involved no sediment ponds will be constructed.

**ATTACHMENT "I"****Inspection and Maintenance for BMP's**



### Inspection and Maintenance Plan

The contractor is required to inspect the fences and rock berms at weekly intervals and after any rainfall events to insure that they are functioning properly. The contractor is required to document any changes on the Site Plan; documentation must include person performing task, task performed, and date. The contractor must also document if proper inspection measures have been taken while making changes. The person(s) responsible for maintenance controls and fences shall immediately make any necessary repairs to damaged areas.

Construction Entrance/Exit: The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic cleanup of existing entrances/exits. All sediment spilled, dropped, washed, or tracked onto public rights-of-way should be removed immediately by contractor. When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way. When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin. All sediment should be prevented from entering any storm drain, ditch, or watercourse by using approved methods.

Silt Fence: Remove sediment when buildup reaches 6 inches. Replace any torn fabric or install a second line of fencing parallel to the torn section. Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points. When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

Rock Berm: Remove sediment and debris when buildup reaches 6 inches. Replace or rebuild any sections of berm that become damaged. Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of berm is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the rock berm should be revegetated.

TCEQ staff will be allowed full access to the property during construction of the project for inspecting controls and fences and to verify that the accepted plan is being utilized in the field. TCEQ staff has the right to speak with the contractor to verify plan changes and modifications.

Any changes made to the location or type of controls shown on the accepted plans, due to onsite conditions, shall be documented on the site plan that is part of this Water Pollution Abatement Plan. No other changes shall be made unless approved by TCEQ and the Design Engineer. The contractor is required to document any changes on the Site Plan, documentation must include person performing task, task performed, and date. The contractor must also document if proper inspection measures have been taken while making changes. Documentation shall clearly show changes made, date, and person responsible and reason change was made.

## **ATTACHMENT "J"**

### **Schedule of Interim and Permanent Soil Stabilization Practices**

Areas which are disturbed by construction staging and storage areas will be hydra mulched with the appropriate seed mixture. Areas between the edge of construction site and right-of-way line will also be hydra mulched if soil layers exist. Areas within 15' of new pavement will be protected with an engineered vegetative filter strip and remaining areas will be landscaped with appropriate plants and mulched. There will be no fill slopes exceeding a 3:1 slope and all fill slopes will be hydra mulched. All disturbed soils should be seeded or otherwise stabilized within 14 calendar days after final grading or where construction activity has temporarily -ceased for more than 21 days. Installation and acceptable mixtures of hydra mulch are as follows:

#### **Materials:**

Hydraulic Mulches: Wood fiber mulch can be applied alone or as a component of hydraulic matrices. Wood fiber applied alone is typically applied at the rate of 2,000 to 4,000 lb/acre. Wood fiber mulch is manufactured from wood or wood waste from lumber mills or from urban sources.

Hydraulic Matrices: Hydraulic matrices include a mixture of wood fiber and acrylic polymer or other tackifier as binder. Apply as a liquid slurry using a hydraulic application machine (i.e., hydra seeder) at the following minimum rates, or as specified by the manufacturer to achieve complete coverage of the target area: 2,000 to 4,000 lb/acre wood fiber mulch, and 5 to 10% (by weight) of tackifier (acrylic copolymer, guar, psyllium, etc.)

Bonded Fiber Matrix: Bonded fiber matrix (BFM) is a hydraulically applied system of fibers and adhesives that upon drying forms an erosion resistant blanket that promotes vegetation, and prevents soil erosion. BFMs are typically applied at rates from 3,000 lb/acre to 4,000 lb/acre based on the manufacturer's recommendation. A biodegradable BFM is composed of materials that are 100% biodegradable. The binder in the BFM should also be biodegradable and should not dissolve or disperse upon re-wetting. Typically, biodegradable BFMs should not be applied immediately before, during, or immediately after rainfall if the soil is saturated. Depending on the product, BFMs typically require 12 to 24 hours to dry and become effective.

#### **Seed Mixtures:**

<b><u>Dates</u></b>	<b><u>Climate</u></b>	<b><u>Species</u></b>	<b><u>(lb/ac.)</u></b>
Sept. 1 to Nov. 30	Temporary Cool Season	Tall Fescue	4.0
		Oats	21.0
		Wheat's	30.0
		<b>Total</b>	<b>55.0</b>
Sept. 1 to Nov. 30	Cool Season Legume	Hairy Vetch	8.0
May 1 to Aug. 31	Temporary Warm Season	Foxtail Millet	30.0

Fertilizer: Fertilizer should be applied at the rate of 40 pounds of nitrogen and 40 pounds of phosphorus per acre, which is equivalent to about 1.0 pounds of nitrogen and phosphorus per 1000 square feet.

**Installation:**

- (1) Prior to application, roughen embankment and fill areas by rolling with a crimping or punching type roller or by track walking. Track walking shall only be used where other methods are impractical.
- (2) To be effective, hydraulic matrices require 24 hours to dry before rainfall occurs.
- (3) Avoid mulch over spray onto roads, sidewalks, drainage channels, existing vegetation, etc.

**Owner's Information:**

Owner: Nature's Symphony RV Resort, LLC  
Contact: Mark Harebottle  
Phone: (512)856-0754  
Address: 2010 Hoffman Lane  
New Braunfels, Texas 78312

**Design Engineer:**

Company: Tri-Tech Engineering, L.P.  
Contact: Al Carroll Jr., P.E.  
Phone: (512) 440-0222  
Address: 155 Riverwalk Dr.  
San Marcos, Texas 78666

**Person or Firm Responsible for Erosion/Sedimentation Control Maintenance:**

Company: To be determined  
Contact:  
Phone:  
Address:

Signature of Responsible Party: \_\_\_\_\_

**This portion of the form shall be filled out and signed by the responsible party prior to construction.**

# Permanent Stormwater Section

## Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(C), (D)(li), (E), and (5), Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

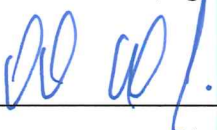
## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Permanent Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Al Carroll, P.E.

Date: 8/5/2024

Signature of Customer/Agent



Regulated Entity Name: Nature's Symphony RV Resort, LLC

## Permanent Best Management Practices (BMPs)

*Permanent best management practices and measures that will be used during and after construction is completed.*

1. ☒ Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.  
☐ N/A
2. ☒ These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.  
☒ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

☐ A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is: \_\_\_\_\_

☐ N/A

3. ☒ Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.

☐ N/A

4. Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

☐ The site will be used for low density single-family residential development and has 20% or less impervious cover.

☐ The site will be used for low density single-family residential development but has more than 20% impervious cover.

☒ The site will not be used for low density single-family residential development.

5. The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

☐ **Attachment A - 20% or Less Impervious Cover Waiver.** The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.

☒ The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.

☒ The site will not be used for multi-family residential developments, schools, or small business sites.

6. ☐ **Attachment B - BMPs for Upgradient Stormwater.**



- ☒ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.
  - ☐ No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.
  - ☐ Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.
7. ☒ **Attachment C - BMPs for On-site Stormwater.**
- ☒ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.
  - ☐ Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.
8. ☐ **Attachment D - BMPs for Surface Streams.** A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is attached. Each feature identified in the Geologic Assessment as sensitive has been addressed.
- ☒ N/A
9. ☒ The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.
- ☒ The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.
  - ☐ **Attachment E - Request to Seal Features.** A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.
10. ☒ **Attachment F - Construction Plans.** All construction plans and design calculations for the proposed permanent BMP(s) and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. The plans are attached and, if applicable include:
- ☒ Design calculations (TSS removal calculations)
  - ☒ TCEQ construction notes
  - ☒ All geologic features
  - ☒ All proposed structural BMP(s) plans and specifications
  - ☐ N/A

11. ☒ **Attachment G - Inspection, Maintenance, Repair and Retrofit Plan.** A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:
- ☒ Prepared and certified by the engineer designing the permanent BMPs and measures
  - ☒ Signed by the owner or responsible party
  - ☒ Procedures for documenting inspections, maintenance, repairs, and, if necessary retrofit
  - ☒ A discussion of record keeping procedures
- ☒ N/A
12. ☐ **Attachment H - Pilot-Scale Field Testing Plan.** Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.
- ☒ N/A
13. ☐ **Attachment I - Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.
- ☒ N/A

### ***Responsibility for Maintenance of Permanent BMP(s)***

*Responsibility for maintenance of best management practices and measures after construction is complete.*

14. ☒ The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.
- ☐ N/A
15. ☒ A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.
- ☐ N/A

**ATTACHMENT "A"**

**20% or Less Impervious Cover Waiver, if project is multi-family residential, a school, or a small business and 20% or less impervious cover is proposed.**

N/A

**ATTACHMENT "B"**

**BMPs for Upgradient Stormwater**

The proposed bioretention ponds are designed to prevent pollution from stormwater that generates upgradient of the site.

**ATTACHMENT "C"**

**BMPs for On-site Stormwater**

The proposed bioretention ponds are designed to prevent pollution from stormwater that generates onsite.

**ATTACHMENT "D"**

**BMPs for Surface Streams**

N/A

**ATTACHMENT "E"**

**Request to Seal Features (if sealing a feature)**

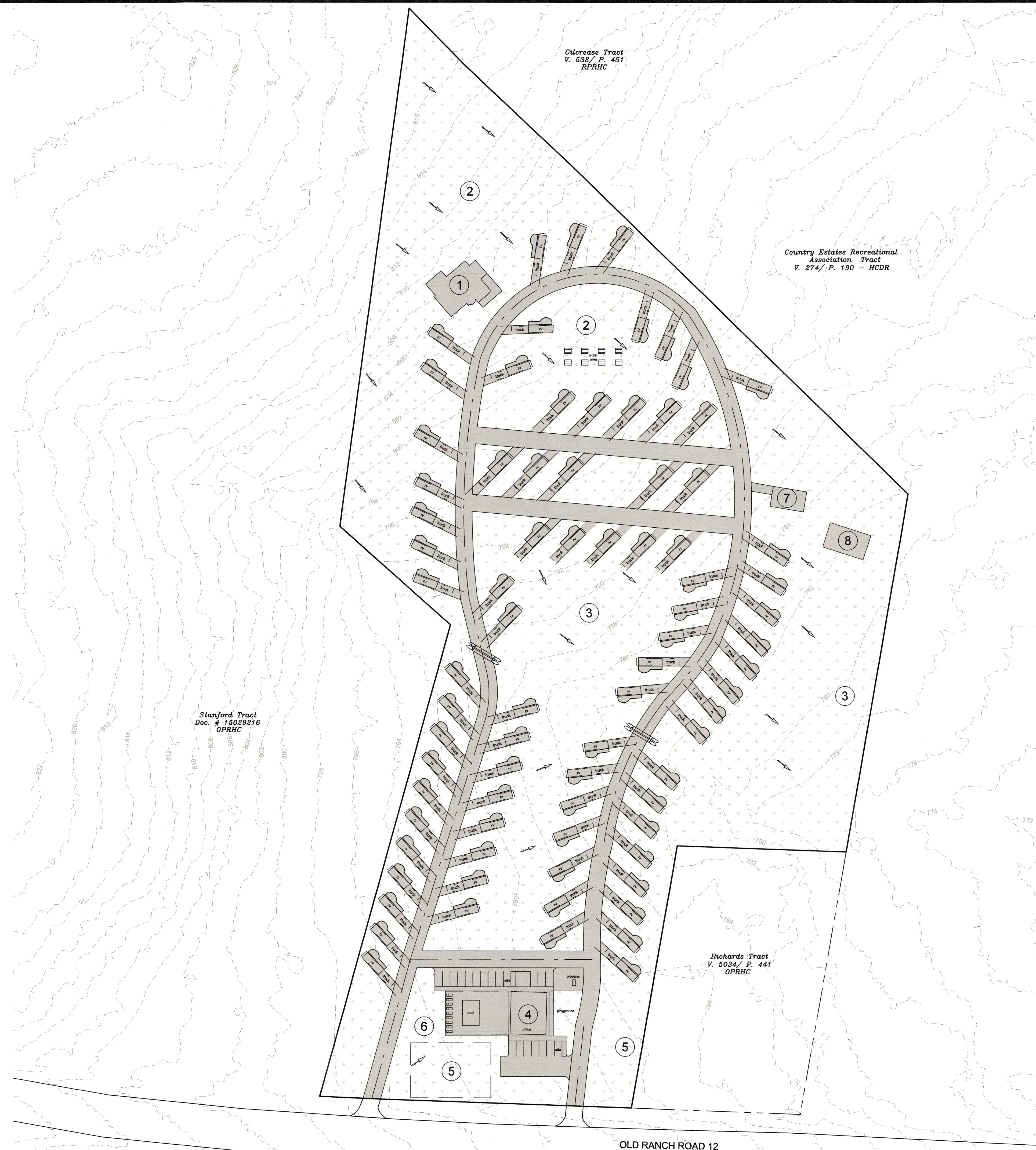
N/A

Nature's Symphony RV Park  
Water Pollution Abatement Plan

Permanent Stormwater  
Attachments

ATTACHMENT "F"  
Construction Plans





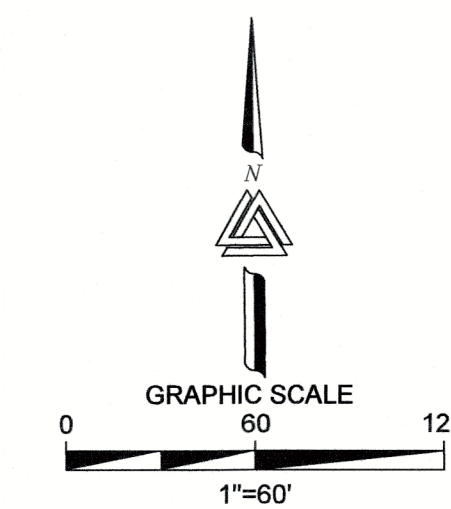
#### LEGEND

- ASSUMED IMPERVIOUS AREA
- UNDISTURBED VEGETATIVE AREA
- FLOW ARROW
- 1 AMENITY CENTER
- 2 GREEN SPACE
- 3 SEPTIC SPRAY FIELD
- 4 LEASING OFFICE
- 5 SEPTIC TANKS
- 6 DUMP STATION
- 7 MANAGER'S HOUSE
- 8 SITE EQUIPMENT STORAGE AREA

#### LAND USE INFORMATION

##### IMPERVIOUS COVER CALCULATIONS

Lot Area:	532,320 SQ. FT. (12.22 Acres)
Post Development Impervious Cover:	
Buildings:	8,106 SQ. FT. (0.19 Acres)
Paved Areas:	134,138 SQ. FT. (3.08 Acres) (Paved Roads & RV spots)
Total Impervious Area =	142,243 SQ. FT. (3.27 Acres)
Total Impervious Coverage =	26.7%



NO	REVISION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

This drawing was prepared by TRI-TECH Engineering, LP (TRI-TECH) as an instrument of service, and shall remain the property of TRI-TECH. The information herein shall be used only by the client to whom the services are rendered and only for the purpose of constructing or installing the work as shown at the designated address. Any other use, including (without limitation) any reproduction or alteration, is strictly prohibited, and the user shall hold harmless and indemnify TRI-TECH from all liabilities which may arise from such unauthorized use.

TCEQ W-QUALITY REQUIRED PLANS  
2404 Ranch Road 12  
2404 RANCH ROAD 12  
CITY OF SAN MARCOS  
HAYS COUNTY, TEXAS

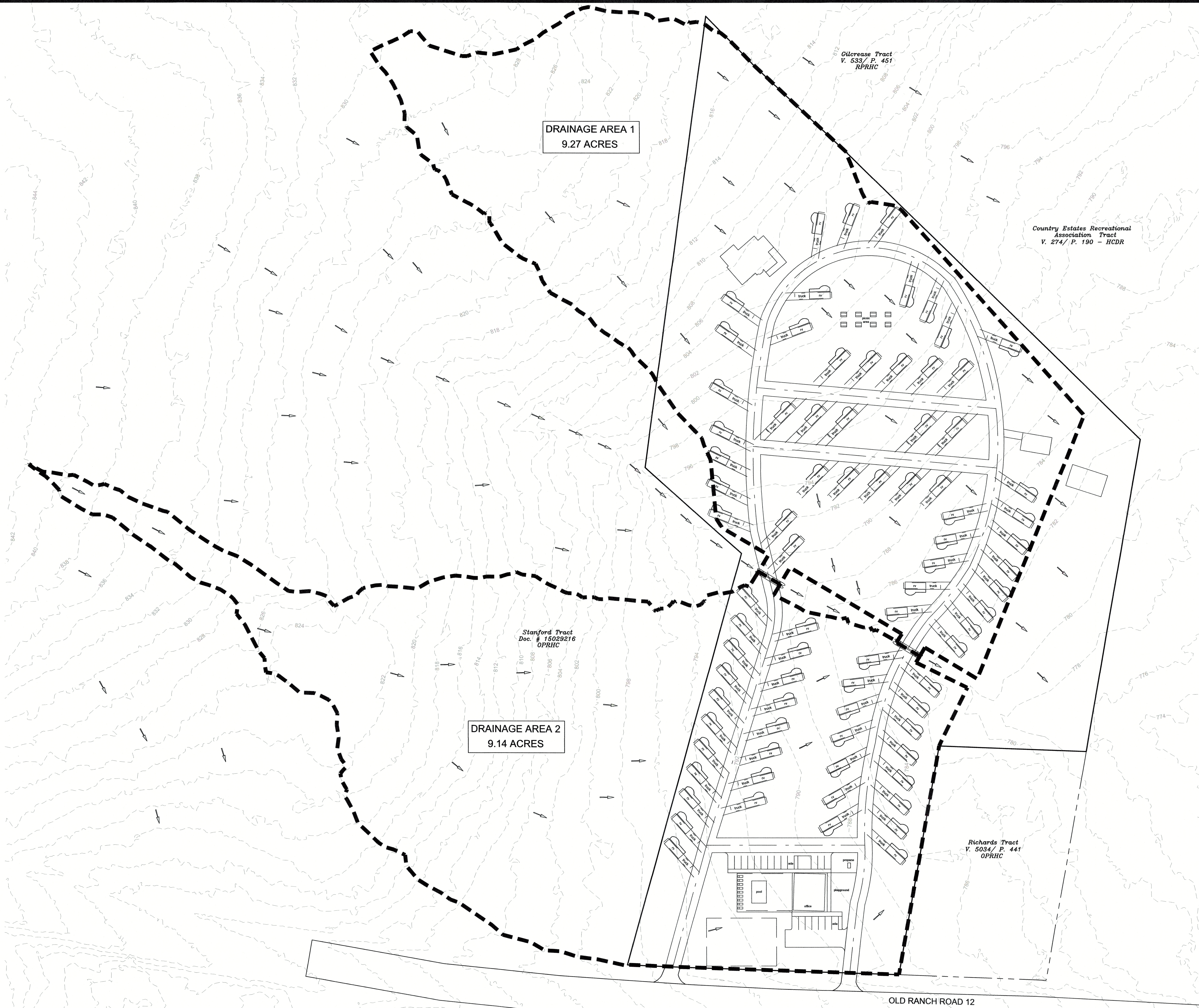


**TRI-TECH**  
ENGINEERING, L.P.  
155 RIVERWALK DRIVE  
SAN MARCOS, TEXAS 78666  
PH: 817-440-0222  
www.tritechtx.com  
TBBPE REGIS. #: F-186093

PROJ. NO: SM-23-1130  
DRAWN BY: RM  
CHECKED BY: AL  
DESIGN BY: RM  
DATE: 07/09/2024  
SCALE: 1"=60'  
SHEET:

SITE PLAN





NO	REVISION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		
91		
92		
93		
94		
95		
96		
97		
98		
99		
100		

This drawing was prepared by TRI-TECH Engineering, LP (TRI-TECH) as an instrument of service, and shall remain the property of TRI-TECH. The information hereon shall be used only by the client to whom the services are rendered and only for the purpose of constructing or installing the work as shown at the designated address. Any other use, including (without limitation) any reproduction or alteration, is strictly prohibited, and the user shall hold harmless and indemnify TRI-TECH from all liabilities which may arise from such unauthorized use.

**TCEQ W-QUALITY REQUIRED PLANS**  
2404 Ranch Road 12

**2404 RANCH ROAD 12**  
**CITY OF SAN MARCOS**  
**HAYS COUNTY, TEXAS**

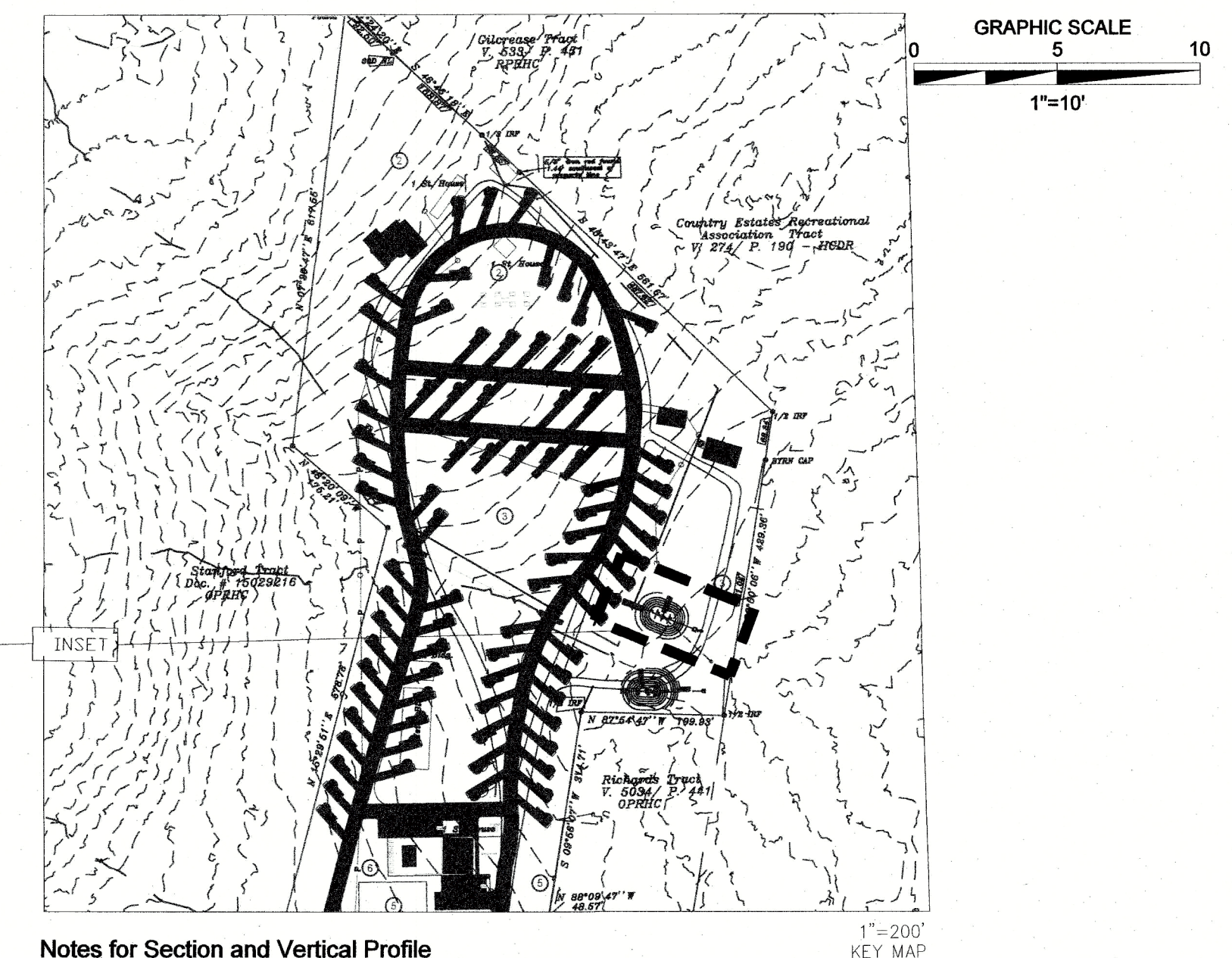
**STATE OF TEXAS**  
**ALVORIS CARROLL JR.**  
119251  
PROFESSIONAL ENGINEER  
7/4/2024

**TRI-TECH**  
ENGINEERING, L.P.  
155 RIVERWALK DRIVE  
SAN MARCOS, TEXAS 78666  
PH: 512-440-0222  
www.tritechtx.com  
TBPB REGIS. #: F-18693

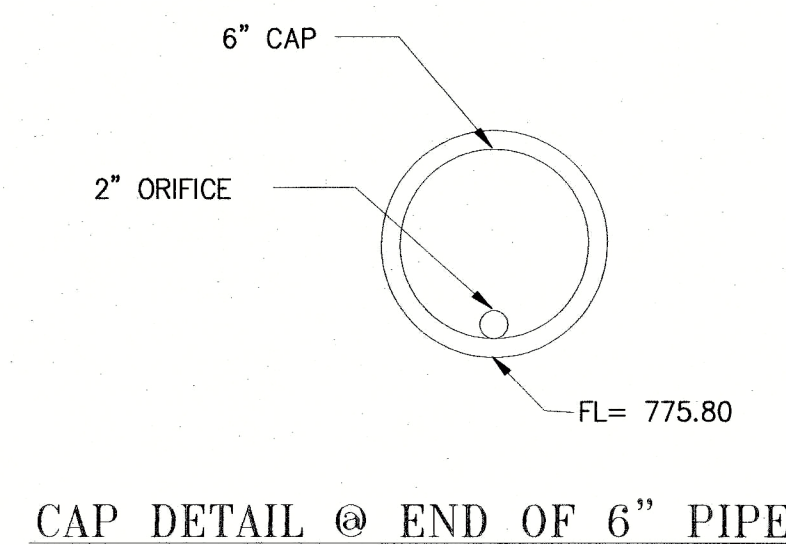
PROJ. NO: SM-23-1130  
DRAWN BY: RM  
CHECKED BY: AL  
DESIGN BY: RM  
DATE: 07/09/2024  
SCALE: 1"=60'  
SHEET:

**WATER QUALITY**  
**SUB-BASIN MAP**



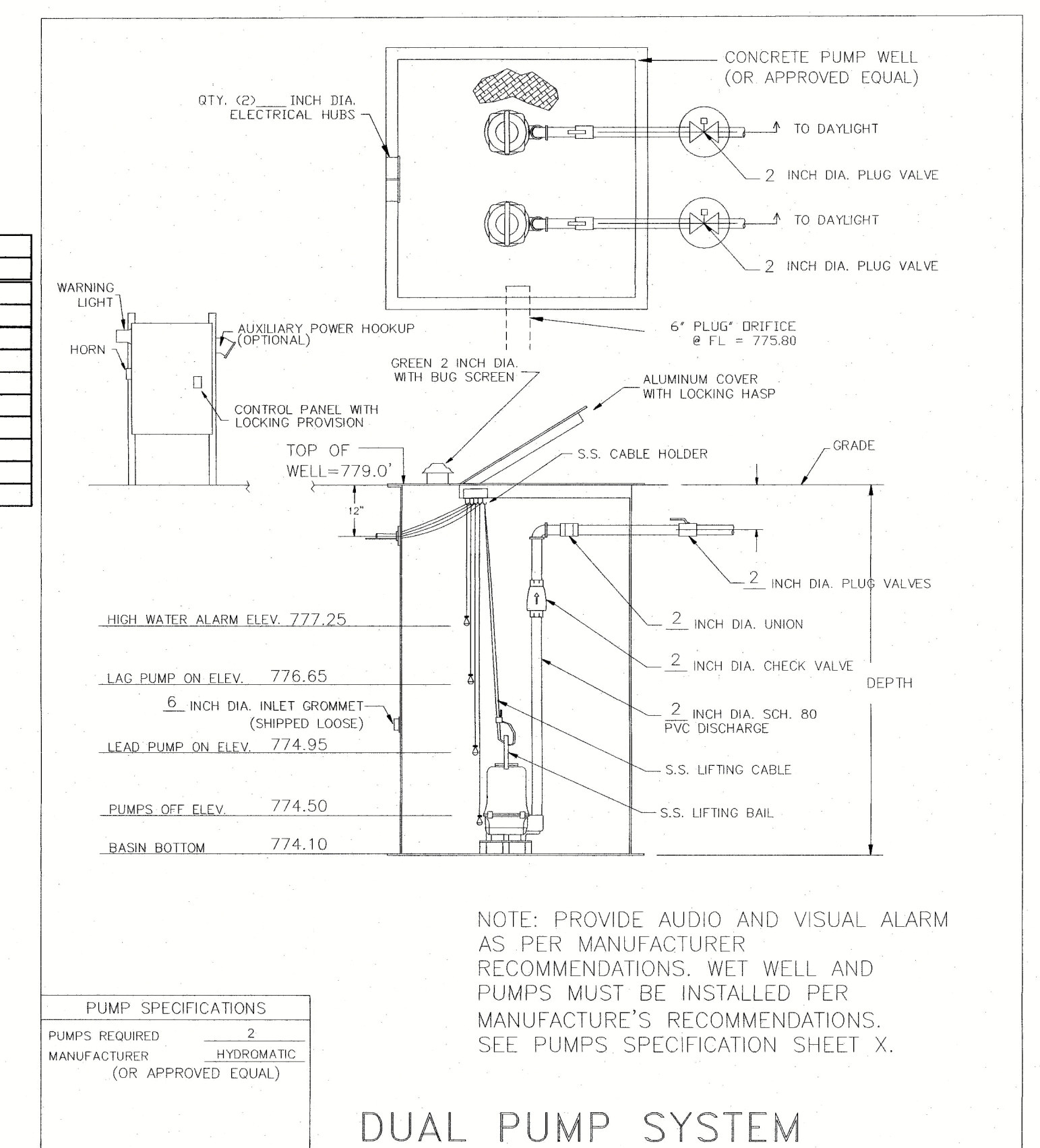
[illegible]

- Notes for Section and Vertical Profile
1. Earthen berm shall be installed following "Earth Embankments" compacted using "ordinary compaction" method in TXDOT Standard Specification ITEM #132.
2. Earthen berm shall have 1V13H slopes in both sides.
3. Perforated PVC pipes shall be perforated Smooth-Wall PVC pipe Type 8) in TXDOT Standard Specification ITEM #556.
4. Perforated PVC pipes shall NOT be sleeved by filter fabric.
5. Sand far filter media shall meet AASHTO M-6 or ASTM C-33 with grain size 0.02 -0.04" (same as sand filter).
6. If Composts is used for filter media, it shall meet TXDOT Standard Specification ITEM #161.
7. Compaction of bioretention soil media shall be minimized during construction.
8. Fertilizer, herbicide, or pesticide shall NOT be used.
9. 5 gal. of Texas Sages shall be planted and irrigated according to TXDOT Standard Specification #192.
10. The filtration media should have a maximum clay content of less than 5%.
11. The soil mixture should be 50-60% sand; 20-30% compost; and 20-30% topsoil.
12. The soil should be a uniform mix, free of stones, stumps, roots, or other similar objects larger than two inches.
13. No other materials or substances should be mixed or dumped within the bioretention that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations.
14. Provide clean sand, free of deleterious materials.



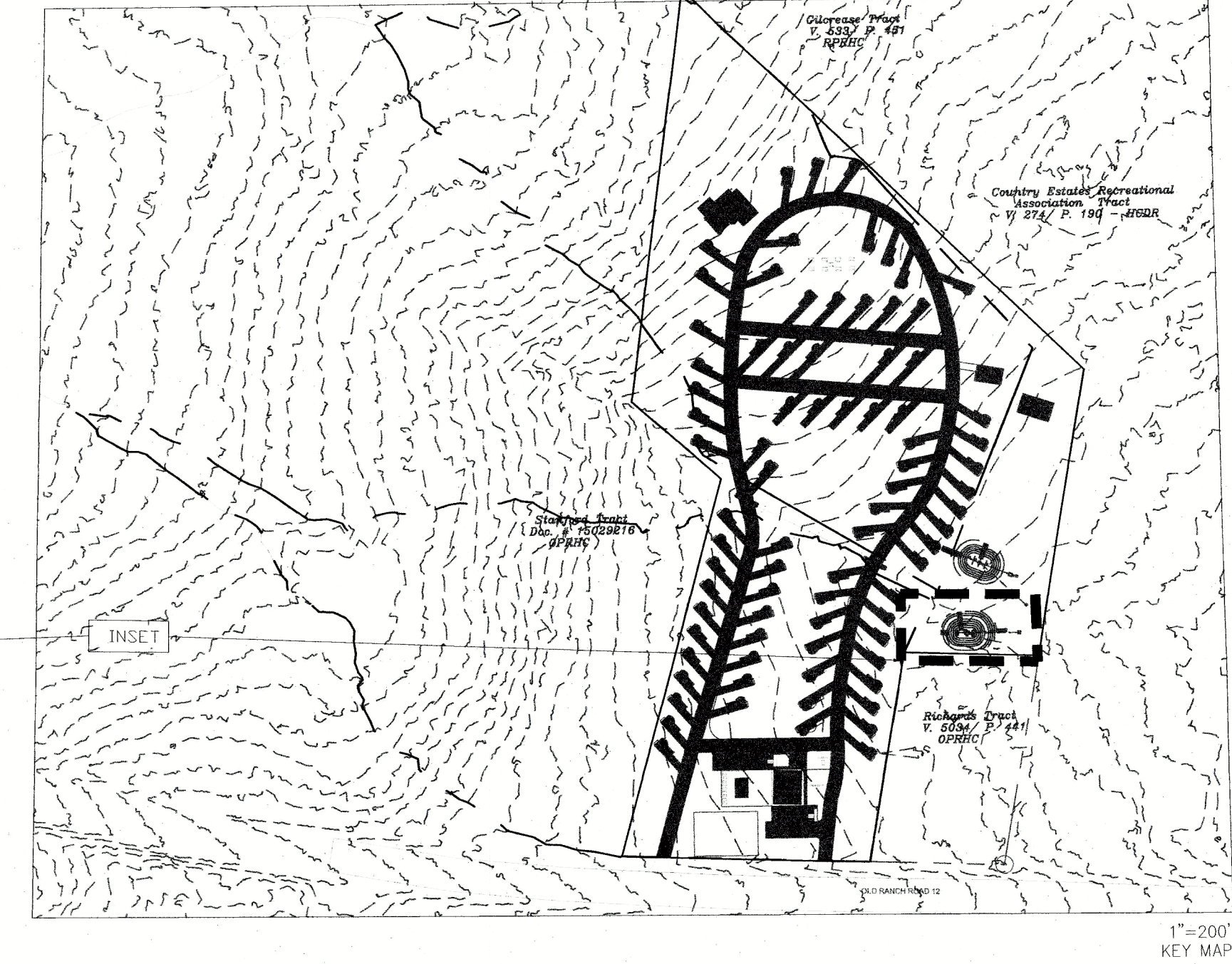
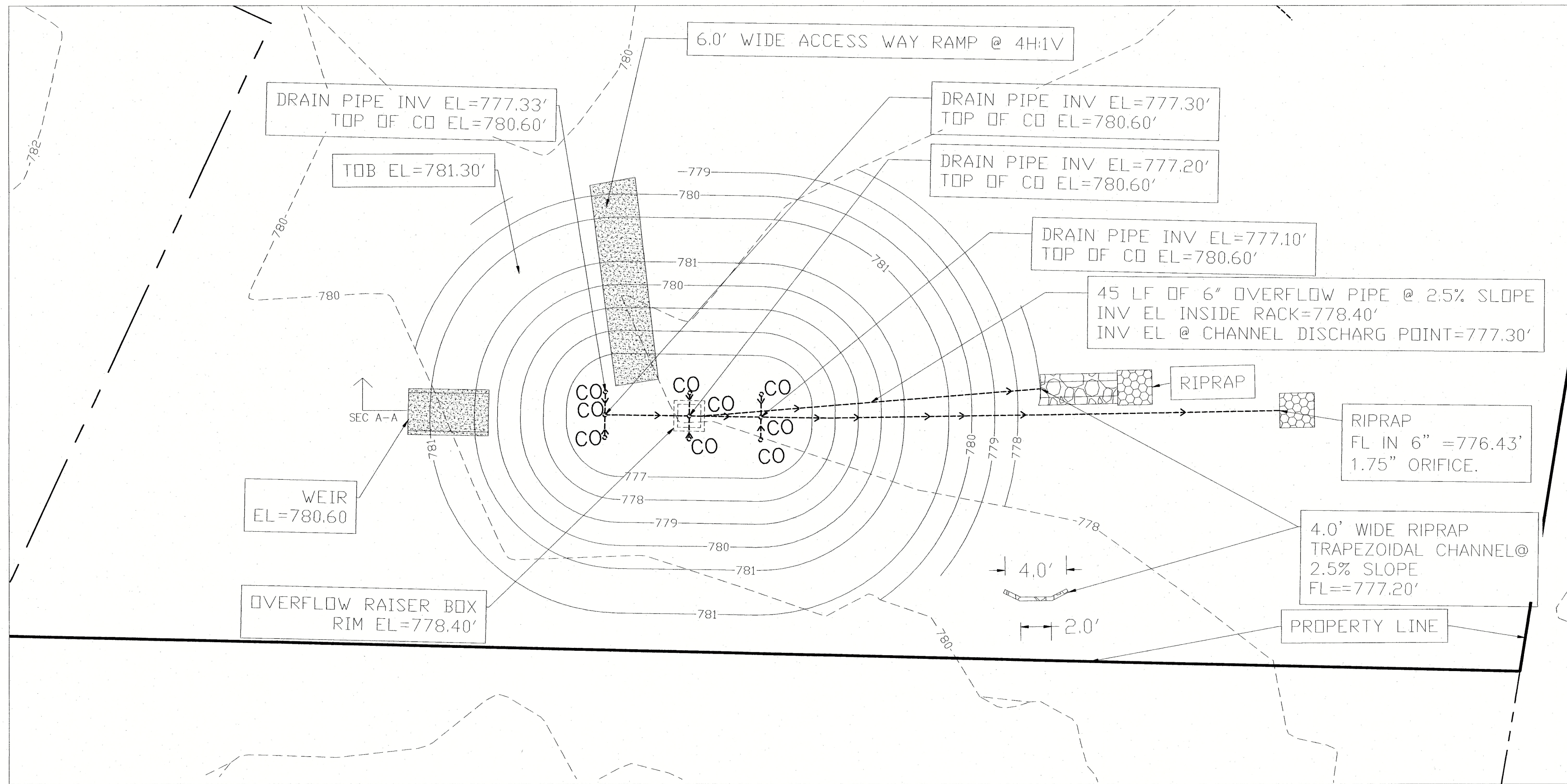
Orifice to empty WQ volume in 12hr < 1 < 6hrs		
Circular orifice $G = CoA(2gh)^{0.5}$		
Co =	0.6	Orifice Diam (in) = 2
A =	0.0218 s.f.	
Top of Sand Elev =	778.90 ft	
WQ Surface Elevation =	779.39 ft	
Flow line of WQ drain pipe =	775.5 ft	
Orifice elevation at CL =	775.88 ft	
Height =	3.32 ft	Average Water head
Q =	0.191 cfs	CoA(2gh) <sup>0.5</sup>
Volume to Drain =	4.92 c.f.	
Downflow Time =	7.15 hours	

Retention POND				
STAGE vs. AREA vs. STORAGE				
ELEV. (ft)	AREA (ft <sup>2</sup> )	INC. VOLUME (ft <sup>3</sup> )	CUM. VOLUME (ft <sup>3</sup> )	DEPTH (ft)
776.10	715		0	
777.00	1122	827	827	0
779.00	1948	3070	3897	2
779.50	2154	1026	4922	
Required volume			3861	



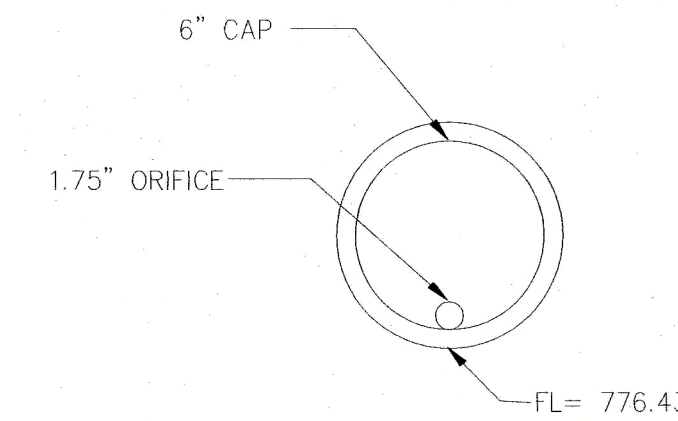


# DA#2(DRAINAGE AREA #2 WATER QUALITY POND)



## Notes for Section and Vertical Profile

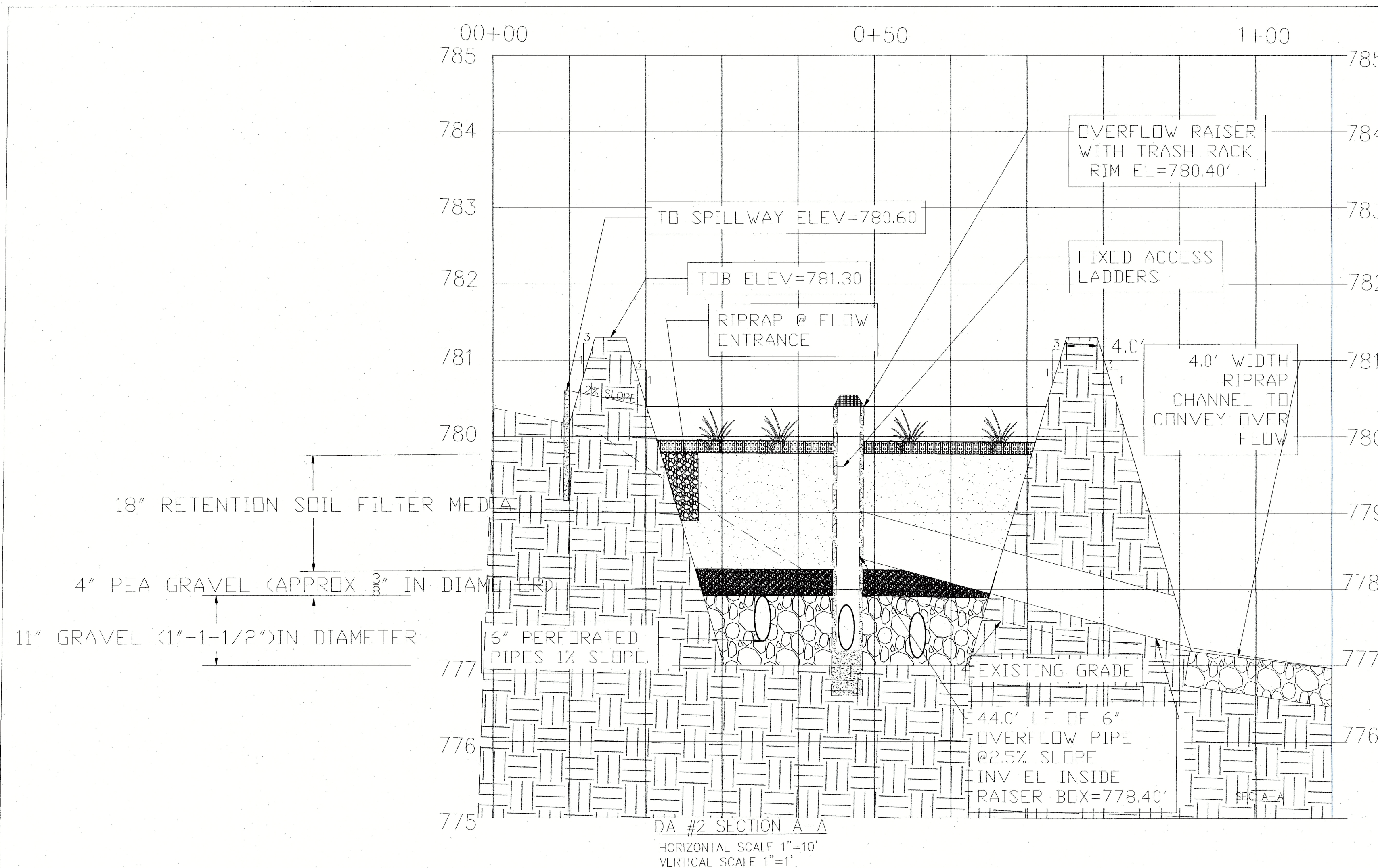
1. Earthen berm shall be installed following "Earth Embankments" compacted using "ordinary compaction" method in TXDOT Standard Specification ITEM #132.
2. Earthen berm shall have 1V13H slopes in both sides.
3. Perforated PVC pipes shall be perforated Smooth-Wall PVC pipe Type 8) in TXDOT Standard Specification ITEM #556.
4. Perforated PVC pipes shall NOT be sleeved by filter fabric.
5. Sand far filter media shall meet AASHTO M-6 or ASTM C-33 with grain size 0.02 -0.04" (same as sand filter).
6. If Composts is used for filter media, it shall meet TXDOT Standard Specification ITEM #161.
7. Compaction of bioretention soil media shall be minimized during construction.
8. Fertilizer, herbicide, or pesticide shall NOT be used.
9. 5 gal. of Texas Sages shall be planted and irrigated according to TXDOT Standard Specification #192.
10. The filtration media should have a maximum clay content of less than 5%.
11. The soil mixture should be 50-60% sand; 20-30% compost; and 20-30% topsoil.
12. The soil should be a uniform mix, free of stones, stumps, roots, or other similar objects larger than two inches.
13. No other materials or substances should be mixed or dumped within the bioretention that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations.
14. Provide clean sand, free of deleterious materials.



CAP DETAIL @ END OF 6" PIPE

Orifice to empty WQ POND #2 volume in 12hr < 6hrs			
Circular orifice		$Q = CoA(2gH)^{0.5}$	
$Co =$	0.6	Orifice Diam (in) = 1.75	
$A =$	0.0167 s.f.		
Top of Sand Elev =	779.75 ft		
WQ Surface Elevation=	780.40 ft		
Flow line of WQ drain pipe =	776.43 ft		
Orifice elevation at CL=	776.50 ft		
Height =	3.57 ft	Average Water head	
$Q =$	0.132 cfs	$CoA(2gH)^{0.5}$	
Volume to Drain =	3708 c.f.		
Drawdown Time =	6.78 hours		

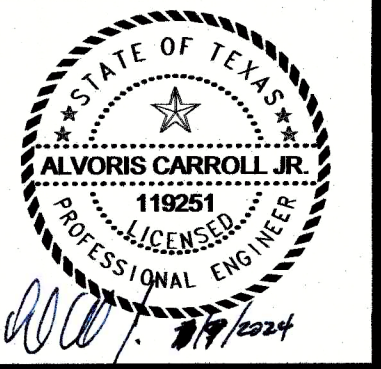
Retention POND for DA#2				
STAGE vs. AREA vs. STORAGE				
ELEV.	AREA	INC. VOLUME	CUM. VOLUME	DEPTH
(ft)	(ft <sup>2</sup> )	(ft <sup>3</sup> )	(ft <sup>3</sup> )	(ft)
777.00	470		0	0
778.00	835	653	653	1.00
779.00	1200	1018	1670	2.00
780.40	1711	2038	3708	3.40
Required volume			3089	



NO	REVISION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

This drawing was prepared by TRI-TECH Engineering, LP (TRI-TECH) as an instrument of service, and shall remain the property of TRI-TECH. The information herein shall be used only by the client to whom the services are rendered and only for the purpose of constructing or installing the work as shown at the designated address. Any other use, including (without limitation) any reproduction or alteration, is strictly prohibited, and the user shall hold harmless and indemnify TRI-TECH from all liabilities which may arise from such unauthorized use.

TCEQ W-QUALITY REQUIRED PLANS  
2404 Ranch Road 12  
2404 RANCH ROAD 12  
CITY OF SAN MARCOS  
HAYS COUNTY, TEXAS



TRI-TECH  
ENGINEERING, L.P.  
155 RIVERWALK DRIVE  
SAN MARCOS, TEXAS 78066  
PH: 312.440.0222

PROJ. NO: SM-23-1130  
DRAWN BY: RM  
CHECKED BY: AL  
DESIGN BY: RM  
DATE: 07/09/2024  
SCALE: 1"=10'  
SHEET:  
2 OF 2  
RETENTION WATER  
QUALITY POND FOR (DA#2)



Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Nature's Symphony RV Park-DA1**  
Date Prepared: **8/25/2024**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.  
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.  
Characters shown in red are data entry fields.  
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3:  $L_M = 27.2(A_N \times P)$

where:  $L_{M \text{ TOTAL PROJECT}}$  = Required TSS removal resulting from the proposed development = 80% of increased load  
 $A_N$  = Net increase in impervious area for the project  
 $P$  = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Hays	
Total project area included in plan * =	8.15	acres
Predevelopment impervious area within the limits of the plan * =	0.63	acres
Total post-development impervious area within the limits of the plan * =	1.83	acres
Total post-development impervious cover fraction * =	0.22	
P =	33	inches

$L_{M \text{ TOTAL PROJECT}}$  = 1073 lbs.

\* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1





2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	1	
Total drainage basin/outfall area =	8.15	acres
Predevelopment impervious area within drainage basin/outfall area =	0.63	acres
Post-development impervious area within drainage basin/outfall area =	1.83	acres
Post-development impervious fraction within drainage basin/outfall area =	0.22	
$L_M$ THIS BASIN =	1077	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Bioretention  
Removal efficiency = 89 percent

- Aqualogic Cartridge Filter
- Bioretention
- Contech StormFilter
- Constructed Wetland
- Extended Detention
- Grassy Swale
- Retention / Irrigation
- Sand Filter
- Stormceptor
- Vegetated Filter Strips
- Vortechs
- Wet Basin
- Wet Vault

4. Calculate Maximum TSS Load Removed ( $L_R$ ) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7:  $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

$A_C$  = Total On-Site drainage area in the BMP catchment area  
 $A_I$  = Impervious area proposed in the BMP catchment area  
 $A_P$  = Pervious area remaining in the BMP catchment area  
 $L_R$  = TSS Load removed from this catchment area by the proposed BMP

$A_C$  = 8.15 acres  
 $A_I$  = 1.83 acres  
 $A_P$  = 6.32 acres  
 $L_R$  = 1960 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired  $L_{M \text{ THIS BASIN}}$  = 1077 lbs.  
 $F$  = 0.55

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.

Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth = 0.49 inches  
Post Development Runoff Coefficient = 0.22  
On-site Water Quality Volume = 3117 cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = 2.86 acres  
Off-site Impervious cover draining to BMP = 0.00 acres  
Impervious fraction of off-site area = 0.00  
Off-site Runoff Coefficient = 0.02

Off-site Water Quality Volume = 101 cubic feet

Storage for Sediment = 644

Total Capture Volume (required water quality volume(s) x 1.20) = 3861 cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.  
The values for BMP Types not selected in cell C45 will show NA.

7. Retention/Irrigation System

Designed as Required in RG-348

Pages 3-42 to 3-46

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

Soil infiltration/permeability rate = 0.1 in/hr

Irrigation area = NA square feet

NA acres

Enter determined permeability rate or assumed value of 0.1

8. Extended Detention Basin System

Designed as Required in RG-348

Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = NA cubic feet

9. Filter area for Sand Filters

Designed as Required in RG-348

Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin = NA cubic feet

Minimum filter basin area = NA square feet

Maximum sedimentation basin area = NA square feet

Minimum sedimentation basin area = NA square feet

For minimum water depth of 2 feet

For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

10. Bioretention System

Designed as Required in RG-348      Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin =	3861	cubic feet
--	------	------------

11. Wet Basins

Designed as Required in RG-348      Pages 3-66 to 3-71

Required capacity of Permanent Pool =	NA	cubic feet	Permanent Pool Capacity is 1.20 times the WQV Total Capacity should be the Permanent Pool Capacity plus a second WQV.
Required capacity at WQV Elevation =	NA	cubic feet	

12. Constructed Wetlands

Designed as Required in RG-348      Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands =	NA	cubic feet
--	----	------------

13. AquaLogic™ Cartridge System

Designed as Required in RG-348      Pages 3-74 to 3-78

\*\* 2005 Technical Guidance Manual (RG-348) does not exempt the required 20% increase with maintenance contract with AquaLogic™.

Required Sedimentation chamber capacity =	NA	cubic feet
Filter canisters (FCs) to treat WQV =	NA	cartridges
Filter basin area (RIA <sub>F</sub> ) =	NA	square feet

14. Stormwater Management StormFilter® by CONTECH

Required Water Quality Volume for Contech StormFilter System = NA cubic feet

THE SIZING REQUIREMENTS FOR THE FOLLOWING BMPs / LOAD REMOVALS ARE BASED UPON FLOW RATES - NOT CALCULATED WATER QUALITY VOLUMES

15. Grassy Swales

Designed as Required in RG-348

Pages 3-51 to 3-54

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A = acres  
Impervious Cover in Drainage Area = 5.04 acres  
Rainfall intensity = i = 1.1 in/hr  
Swale Slope = 0.01 ft/ft  
Side Slope (z) = 3  
Design Water Depth = y = 0.33 ft  
Weighted Runoff Coefficient = C = #DIV/0!

A<sub>CS</sub> = cross-sectional area of flow in Swale = #DIV/0! sf  
P<sub>W</sub> = Wetted Perimeter = #DIV/0! feet  
R<sub>H</sub> = hydraulic radius of flow cross-section = A<sub>CS</sub>/P<sub>W</sub> = #DIV/0! feet  
n = Manning's roughness coefficient = 0.2

15A. Using the Method Described in the RG-348

Manning's Equation:  $Q = \frac{1.49}{n} A_{CS} R_H^{2/3} S^{0.5}$



$$b = \frac{0.134 \times Q}{y^{1.67} S^{0.5}} - zy = \text{\#DIV/0!} \quad \text{feet}$$

$$Q = CiA = \text{\#DIV/0!} \quad \text{cfs}$$

To calculate the flow velocity in the swale:

$$V \text{ (Velocity of Flow in the swale)} = Q/A_{CS} = \text{\#DIV/0!} \quad \text{ft/sec}$$

To calculate the resulting swale length:

$$L = \text{Minimum Swale Length} = V \text{ (ft/sec)} \times 300 \text{ (sec)} = \text{\#DIV/0!} \quad \text{feet}$$

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters must be modified and the solver rerun.

#### 15B. Alternative Method using Excel Solver

$$\text{Design } Q = CiA = \text{\#DIV/0!} \quad \text{cfs}$$

$$\begin{aligned} \text{Manning's Equation } Q &= 0.76 \text{ cfs} \\ \text{Swale Width} &= 6.00 \text{ ft} \end{aligned}$$

$$\text{Error 1} = \text{\#DIV/0!}$$

Instructions are provided to the right (green comments).

$$\begin{aligned} \text{Flow Velocity} &= \text{\#DIV/0!} \quad \text{ft/s} \\ \text{Minimum Length} &= \text{\#DIV/0!} \quad \text{ft} \end{aligned}$$

Instructions are provided to the right (blue comments).

Design Width =6 ft

Design Discharge =0.76 cfs

Design Depth =0.33 ft

Flow Velocity =0.32 cfs

Minimum Length =97.48 ft

Error 2 =#DIV/0!

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters may be modified and the solver rerun.  
If any of the resulting values still do not meet the design requirement set forth in RG-348, widening the swale bottom value may not be possible.

16. Vegetated Filter Strips

Designed as Required in RG-348

Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.  
The 80% removal is provided when the contributing drainage area does not exceed 72 feet (direction of flow) and the sheet flow leaving the impervious cover is directed across 15 feet of engineered filter strips with maximum slope of 20% or across 50 feet of natural vegetation with a maximum slope of 10%. There can be a break in grade as long as no slope exceeds 20%.

If vegetative filter strips are proposed for an interim permanent BMP, they may be sized as described on Page 3-56 of RG-348.

17. Wet Vaults

Designed as Required in RG-348

Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 =

NA

lbs

First calculate the load removal at 1.1 in/hour

RG-348 Page 3-30 Equation 3.4:  $Q = CiA$

C = runoff coefficient for the drainage area =

i = design rainfall intensity =

A = drainage area in acres =

0.13

1.1 in/hour

1 acres

$C = \text{Runoff Coefficient} = 0.546 (IC)^2 + 0.328 (IC) + 0.03$

Q = flow rate in cubic feet per second =

0.14 cubic feet/sec

RG-348 Page 3-31 Equation 3.5:  $V_{OR} = Q/A$

Q = Runoff rate calculated above = 0.14 cubic feet/sec  
A = Water surface area in the wet vault = 150 square feet

V<sub>OR</sub> = Overflow Rate = 0.00 feet/sec

Percent TSS Removal from Figure 3-1 (RG-348 Page 3-31) = 53 percent

Load removed by Wet Vault = #VALUE! lbs

If a bypass occurs at a rainfall intensity of less than 1.1 in/hours  
Calculate the efficiency reduction for the actual rainfall intensity rate

Actual Rainfall Intensity at which Wet Vault bypass Occurs = 0.5 in/hour

Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 = 0.75 percent  
Efficiency Reduction for Actual Rainfall Intensity = 0.83 percent

Resultant TSS Load removed by Wet Vault = #VALUE! lbs

18. Permeable Concrete Designed as Required in RG-348 Pages 3-79 to 3-83

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

19. BMPs Installed in a Series Designed as Required in RG-348 Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E<sub>2</sub> be changed from 0.5 to 0.65 on May 3, 2006

E<sub>TOT</sub> = [1 - ((1 - E<sub>1</sub>) X (1 - 0.65E<sub>2</sub>) x (1 - 0.25E<sub>3</sub>))] X 100 = 86.38 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E<sub>1</sub> = 75.00 percent

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E<sub>2</sub> = 70.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E<sub>3</sub> = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:  
(A<sub>I</sub> AND A<sub>P</sub> VALUES ARE FROM SECTION 3 ABOVE)

$L_R = E_{TOT} \times P \times (A_I \times 34.6 \times A_P \times 0.54) = 1902.08 \text{ lbs}$

20. Stormceptor

BMP Sizing

Required TSS Removal in BMP Drainage Area= NA lbs  
Impervious Cover Overtreatment= 0.0000 ac  
TSS Removal for Uncaptured Area = 0.00 lbs

Effective Area = NA EA  
Calculated Model Size(s) = #N/A  
Actual Model Size (if multiple values provided in Calculated  
Model Size or if you are choosing a larger model size) = 0 Model Size

Surface Area = #N/A ft<sup>2</sup>  
Overflow Rate = #VALUE! V<sub>or</sub>  
Rounded Overflow Rate = #VALUE! V<sub>or</sub>  
BMP Efficiency % = #VALUE! %  
L<sub>R</sub> Value = #VALUE! lbs

TSS Load Credit = #VALUE! lbs

Is Sufficient Treatment Available? (TSS Credit ≥ TSS Uncapt.) #VALUE!

TSS Treatment by BMP (LM + TSS Uncapt.) = #VALUE!

21. Vortech

BMP Sizing

Required TSS Removal in BMP Drainage Area=	NA	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs
Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if choosing larger model size) =	Vx1000	Pick Model Size
Surface Area =	7.10	ft <sup>2</sup>
Overflow Rate =	#VALUE!	V <sub>or</sub>
Rounded Overflow Rate =	#VALUE!	V <sub>or</sub>
BMP Efficiency % =	#VALUE!	%
L <sub>R</sub> Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit ≥ TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	



Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Nature's Symphony RV Park-DA2**  
Date Prepared: **8/25/2024**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.  
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.  
Characters shown in red are data entry fields.  
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3:  $L_M = 27.2(A_N \times P)$

where:  $L_{M \text{ TOTAL PROJECT}}$  = Required TSS removal resulting from the proposed development = 80% of increased load  
 $A_N$  = Net increase in impervious area for the project  
 $P$  = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Hays	
Total project area included in plan * =	4.07	acres
Predevelopment impervious area within the limits of the plan * =	0.45	acres
Total post-development impervious area within the limits of the plan * =	1.44	acres
Total post-development impervious cover fraction * =	0.35	
P =	33	inches

$L_{M \text{ TOTAL PROJECT}}$  = 889 lbs.

\* The values entered in these fields should be for the total project area.



Signature: [Handwritten Signature] 8/25/2024

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area = 4.07 acres  
Predevelopment impervious area within drainage basin/outfall area = 0.45 acres  
Post-development impervious area within drainage basin/outfall area = 1.44 acres  
Post-development impervious fraction within drainage basin/outfall area = 0.35  
 $L_M$  THIS BASIN = 889 lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Bioretention  
Removal efficiency = 89 percent

- Aqualogic Cartridge Filter
- Bioretention
- Contech StormFilter
- Constructed Wetland
- Extended Detention
- Grassy Swale
- Retention / Irrigation
- Sand Filter
- Stormceptor
- Vegetated Filter Strips
- Vortechs
- Wet Basin
- Wet Vault

4. Calculate Maximum TSS Load Removed ( $L_R$ ) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7:  $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

$A_C$  = Total On-Site drainage area in the BMP catchment area

$A_I$  = Impervious area proposed in the BMP catchment area

$A_P$  = Pervious area remaining in the BMP catchment area

$L_R$  = TSS Load removed from this catchment area by the proposed BMP

$A_C$  = 4.07 acres

$A_I$  = 1.44 acres

$A_P$  = 2.63 acres

$L_R$  = 1505 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired  $L_{M \text{ THIS BASIN}}$  = 889 lbs.

$F$  = 0.59

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.

Calculations from RG-348

Pages 3-34 to 3-36

Rainfall Depth = 0.56 inches  
Post Development Runoff Coefficient = 0.28  
On-site Water Quality Volume = 2356 cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = 5.36 acres

Off-site Impervious cover draining to BMP = 0.00 acres  
Impervious fraction of off-site area = 0.00  
Off-site Runoff Coefficient = 0.02  
Off-site Water Quality Volume = 218 cubic feet

Storage for Sediment = 515

Total Capture Volume (required water quality volume(s) x 1.20) = 3089 cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.  
The values for BMP Types not selected in cell C45 will show NA.

7. Retention/Irrigation System

Designed as Required in RG-348

Pages 3-42 to 3-46

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

Soil infiltration/permeability rate = 1 in/hr Enter determined permeability rate or assumed value of 0.1  
Irrigation area = NA square feet  
NA acres

8. Extended Detention Basin System

Designed as Required in RG-348

Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = NA cubic feet

9. Filter area for Sand Filters

Designed as Required in RG-348

Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin = NA cubic feet

Minimum filter basin area = NA square feet



Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

**9B. Partial Sedimentation and Filtration System**

Water Quality Volume for combined basins =	NA	cubic feet	
Minimum filter basin area =	NA	square feet	
Maximum sedimentation basin area =	NA	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	NA	square feet	For maximum water depth of 8 feet

**10. Bioretention System**

Designed as Required in RG-348 Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin =	3089	cubic feet
--	------	------------

**11. Wet Basins**

Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool =	NA	cubic feet	Permanent Pool Capacity is 1.20 times the WQV
Required capacity at WQV Elevation =	NA	cubic feet	Total Capacity should be the Permanent Pool Capacity plus a second WQV.

**12. Constructed Wetlands**

Designed as Required in RG-348 Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands =	NA	cubic feet
--	----	------------

**13. AquaLogic™ Cartridge System**

Designed as Required in RG-348 Pages 3-74 to 3-78



**\*\* 2005 Technical Guidance Manual (RG-348) does not exempt the required 20% increase with maintenance contract with AquaLogic™.**

Required Sedimentation chamber capacity =	NA	cubic feet
Filter canisters (FCs) to treat WQV =	NA	cartridges
Filter basin area (RIA <sub>F</sub> ) =	NA	square feet

**14. Stormwater Management StormFilter® by CONTECH**

Required Water Quality Volume for Contech StormFilter System =	NA	cubic feet
--	----	------------

**THE SIZING REQUIREMENTS FOR THE FOLLOWING BMPs / LOAD REMOVALS ARE BASED UPON FLOW RATES - NOT CALCULATED WATER QUALITY VOLUMES**

**15. Grassy Swales**

Designed as Required in RG-348

Pages 3-51 to 3-54

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A =		acres
Impervious Cover in Drainage Area =	5.04	acres
Rainfall intensity = i =	1.1	in/hr
Swale Slope =	0.01	ft/ft
Side Slope (z) =	3	
Design Water Depth = y =	0.33	ft
Weighted Runoff Coefficient = C =	#DIV/0!	

A <sub>CS</sub> = cross-sectional area of flow in Swale =	#DIV/0!	sf
P <sub>W</sub> = Wetted Perimeter =	#DIV/0!	feet
R <sub>H</sub> = hydraulic radius of flow cross-section = A <sub>CS</sub> /P <sub>W</sub> =	#DIV/0!	feet
n = Manning's roughness coefficient =	0.2	

15A. Using the Method Described in the RG-348

Manning's Equation:  $Q = \frac{1.49}{n} A_{CS} R_H^{2/3} S^{0.5}$

$b = \frac{0.134 \times Q}{y^{1.67} S^{0.5}} - zy = \text{\#DIV/0!} \text{ feet}$

$Q = CiA = \text{\#DIV/0!} \text{ cfs}$

To calculate the flow velocity in the swale:

$V \text{ (Velocity of Flow in the swale)} = Q/A_{CS} = \text{\#DIV/0!} \text{ ft/sec}$

To calculate the resulting swale length:

$L = \text{Minimum Swale Length} = V \text{ (ft/sec)} \times 300 \text{ (sec)} = \text{\#DIV/0!} \text{ feet}$

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters must be modified and the solver rerun.

15B. Alternative Method using Excel Solver

$\text{Design } Q = CiA = \text{\#DIV/0!} \text{ cfs}$

$\text{Manning's Equation } Q = 0.76 \text{ cfs}$   
 $\text{Swale Width} = 6.00 \text{ ft}$

$\text{Error 1} = \text{\#DIV/0!}$

Instructions are provided to the right (green comments).

Flow Velocity      #DIV/0!      ft/s  
Minimum Length =      #DIV/0!      ft

Instructions are provided to the right (blue comments).

Design Width =      6 ft  
Design Discharge =      0.76 cfs      Error 2 =      #DIV/0!  
Design Depth =      0.33 ft  
Flow Velocity =      0.32 cfs  
Minimum Length =      97.48 ft

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters may be modified and the solver rerun.  
If any of the resulting values still do not meet the design requirement set forth in RG-348, widening the swale bottom value may not be possible.

16. Vegetated Filter Strips

Designed as Required in RG-348

Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.  
The 80% removal is provided when the contributing drainage area does not exceed 72 feet (direction of flow) and the sheet flow leaving the impervious cover is directed across 15 feet of engineered filter strips with maximum slope of 20% or across 50 feet of natural vegetation with a maximum slope of 10%. There can be a break in grade as long as no slope exceeds 20%.

If vegetative filter strips are proposed for an interim permanent BMP, they may be sized as described on Page 3-56 of RG-348.

17. Wet Vaults

Designed as Required in RG-348

Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 =      NA      lbs

First calculate the load removal at 1.1 in/hour

RG-348 Page 3-30 Equation 3.4:  $Q = CiA$

C = runoff coefficient for the drainage area =	0.21	<b><math>C = \text{Runoff Coefficient} = 0.546 (IC)^2 + 0.328 (IC) + 0.03</math></b>
i = design rainfall intensity =	1.1 in/hour	
A = drainage area in acres =	1 acres	

Q = flow rate in cubic feet per second =	0.24 cubic feet/sec
--	---------------------

RG-348 Page 3-31 Equation 3.5:  $V_{OR} = Q/A$

Q = Runoff rate calculated above =	0.24 cubic feet/sec
A = Water surface area in the wet vault =	150 square feet

$V_{OR}$ = Overflow Rate =	0.00 feet/sec
----------------------------	---------------

Percent TSS Removal from Figure 3-1 (RG-348 Page 3-31) =	53 percent
--	------------

Load removed by Wet Vault =	#VALUE!	lbs
-----------------------------	---------	-----

If a bypass occurs at a rainfall intensity of less than 1.1 in/hours  
Calculate the efficiency reduction for the actual rainfall intensity rate

Actual Rainfall Intensity at which Wet Vault bypass Occurs =	0.5 in/hour
--	-------------

Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 =	0.75 percent
Efficiency Reduction for Actual Rainfall Intensity =	0.83 percent

Resultant TSS Load removed by Wet Vault =	#VALUE!	lbs
---	---------	-----

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

19. BMPs Installed in a Series

Designed as Required in RG-348

Pages 3-32

Michael E. Barrett, Ph.D., P.E. recommended that the coefficient for E<sub>2</sub> be changed from 0.5 to 0.65 on May 3, 2006

$$E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100 =$$

86.38 percent

NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES = E<sub>1</sub> =

75.00 percent

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E<sub>2</sub> =

70.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES = E<sub>3</sub> =

0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:  
(A<sub>i</sub> AND A<sub>p</sub> VALUES ARE FROM SECTION 3 ABOVE)

$$L_R = E_{TOT} \times P \times (A_i \times 34.6 \times A_p \times 0.54) =$$

1460.65 lbs

20. Stormceptor

BMP Sizing	Required TSS Removal in BMP Drainage Area=	NA	lbs
	Impervious Cover Overtreatment=	0.0000	ac
	TSS Removal for Uncaptured Area =	0.00	lbs
	Effective Area =	NA	EA
	Calculated Model Size(s) =	#N/A	
	Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =	0	Model Size
	Surface Area =	#N/A	ft <sup>2</sup>



Overflow Rate = #VALUE! V<sub>or</sub>  
Rounded Overflow Rate = #VALUE! V<sub>or</sub>  
BMP Efficiency % = #VALUE! %  
L<sub>R</sub> Value = #VALUE! lbs

TSS Load Credit = #VALUE! lbs

Is Sufficient Treatment Available? (TSS Credit ≥ TSS Uncapt.) #VALUE!

TSS Treatment by BMP (LM + TSS Uncapt.) = #VALUE!

## 21. Vortech

### BMP Sizing

Required TSS Removal in BMP Drainage Area= NA lbs  
Impervious Cover Overtreatment= 0.0000 ac  
TSS Removal for Uncaptured Area = 0.00 lbs

Effective Area = NA EA  
Calculated Model Size(s) = #N/A

Actual Model Size (if choosing larger model size) = Vx1000 Pick Model Size

Surface Area = 7.10 ft<sup>2</sup>

Overflow Rate = #VALUE! V<sub>or</sub>  
Rounded Overflow Rate = #VALUE! V<sub>or</sub>  
BMP Efficiency % = #VALUE! %  
L<sub>R</sub> Value = #VALUE! lbs

TSS Load Credit = #VALUE! lbs

Is Sufficient Treatment Available? (TSS Credit ≥ TSS Uncapt.) #VALUE!

**ATTACHMENT "G"**

**Inspection, Maintenance, Repair and Retrofit Plan**

**Inspection and Maintenance Plan**

The property owner shall be responsible for inspection, maintenance, repair and retrofit of bioretention ponds.

1. Inspections. BMP facilities should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. During each inspection, erosion areas inside and downstream of the BMP must be identified and repaired or revegetated immediately.
2. Sediment Removal. Remove sediment from the facility when sediment depth reaches 3 inches or when the sediment interferes with the health of vegetation or ability of the facility to meet required drawdown times. Sediment removal should be performed at least every 2 years.
3. Drain Time. When the drain time exceeds 72 hours as observed in the observation well, the filter media should be removed and replaced with more permeable material.
4. Vegetation. All dead and diseased vegetation considered beyond treatment shall be removed and replaced during semi-annual inspections. Diseased trees and shrubs should be treated during inspections. Remulch any bare areas by hand whenever needed. Replace mulch annually in the spring, or more frequently if needed, in landscaped areas of the basin where grass or groundcover is not planted. Grass areas in and around bioretention facilities must be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas.
5. Debris and Litter Removal. Debris and litter will accumulate in the facility and should be removed during regular mowing operations and inspections.
6. Filter Underdrain. Clean underdrain piping network to remove any sediment buildup every 5 years, or as needed to maintain design drawdown time.

**Owner's Information**

Owner: Nature's Symphony RV Park, LLC  
Contact: Mark Harebottle  
Phone: (512) 856-0754  
Address: 2010 Hoffman Lane  
New Braunfels, Texas 78132

**Design Engineer:**

Owner: Tri-Tech Engineering, LP  
Contact: Al Carroll, P.E.  
Phone: (512) 440-0222  
Address: 155 Riverwalk Drive  
San Marcos, Texas 78666



Nature's Symphony RV Park  
Water Pollution Abatement Plan

Permanent Stormwater  
Attachments

**Person or Firm Responsible for Erosion/Sedimentation Control Maintenance:**

Owner: Nature's Symphony RV Park, LLC

Contact: Mark Harebottle

Phone: (512) 856-0754

Address: 2010 Hoffman Lane  
New Braunfels, Texas 78132

Signature of Responsible Party:





**ATTACHMENT "H"**

**Pilot-Scale Field Testing Plan, if BMPs not based on Complying with the Edwards Aquifer Rules:  
Technical Guidance for BMPs**

N/A

**ATTACHMENT "I"**

**Measures for Minimizing Surface Stream Contamination**

N/A

**Agent Authorization Form**  
For Required Signature  
Edwards Aquifer Protection Program  
Relating to 30 TAC Chapter 213  
Effective June 1, 1999

I Mark Harebottle  
Print Name  
Owner  
\_\_\_\_\_  
Title - Owner/President/Other  
of Nature's Symphony RV Resort, LLC  
Corporation/Partnership/Entity Name  
have authorized Al Carroll, P.E.  
Print Name of Agent/Engineer  
of Tri-Tech Engineering, L.P.  
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to \$10,000 per day per violation.
2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.
3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.
4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.
5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

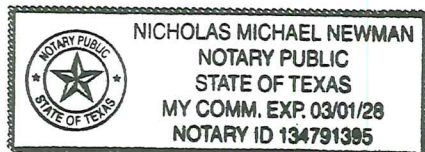
  
Applicant's Signature

08/01/2024  
Date

THE STATE OF Texas §  
County of Comal §

BEFORE ME, the undersigned authority, on this day personally appeared Mark Harebottle known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 01 day of August, 2024.



Nicholas Newman  
NOTARY PUBLIC  
Nicholas Newman  
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 03/01/28



# Application Fee Form

## Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Nature's Symphony RV Resort, LLC

Regulated Entity Location: 2010 Hoffman Lane, New Braunfels TX 78312

Name of Customer: Mark Harebottle

Contact Person: Al Carroll, P.E.

Phone: (512) 440-0222

Customer Reference Number (if issued): CN TBD

Regulated Entity Reference Number (if issued): RN TBD

### Austin Regional Office (3373)

☒ Hays

☐ Travis

☐ Williamson

### San Antonio Regional Office (3362)

☐ Bexar

☐ Medina

☐ Uvalde

☐ Comal

☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment.** This payment is being submitted to:

☐ Austin Regional Office

☐ San Antonio Regional Office

☐ Mailed to: TCEQ - Cashier

☐ Overnight Delivery to: TCEQ - Cashier

Revenues Section

Mail Code 214

P.O. Box 13088

Austin, TX 78711-3088

12100 Park 35 Circle

Building A, 3rd Floor

Austin, TX 78753

(512)239-0357

### Site Location (Check All That Apply):

☒ Recharge Zone

☐ Contributing Zone

☐ Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	12.221 Acres	\$ 6,500
Sewage Collection System	L.F.	\$
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	Each	\$
Extension of Time	Each	\$

Signature: 

Date: 8/5/2024

# Application Fee Schedule

Texas Commission on Environmental Quality

Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

## ***Water Pollution Abatement Plans and Modifications***

### ***Contributing Zone Plans and Modifications***

<b><i>Project</i></b>	<b><i>Project Area in Acres</i></b>	<b><i>Fee</i></b>
One Single Family Residential Dwelling	< 5	\$650
Multiple Single Family Residential and Parks	< 5	\$1,500
	5 < 10	\$3,000
	10 < 40	\$4,000
	40 < 100	\$6,500
	100 < 500	\$8,000
	≥ 500	\$10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1	\$3,000
	1 < 5	\$4,000
	5 < 10	\$5,000
	10 < 40	\$6,500
	40 < 100	\$8,000
	≥ 100	\$10,000

### ***Organized Sewage Collection Systems and Modifications***

<b><i>Project</i></b>	<b><i>Cost per Linear Foot</i></b>	<b><i>Minimum Fee- Maximum Fee</i></b>
Sewage Collection Systems	\$0.50	\$650 - \$6,500

### ***Underground and Aboveground Storage Tank System Facility Plans and Modifications***

<b><i>Project</i></b>	<b><i>Cost per Tank or Piping System</i></b>	<b><i>Minimum Fee- Maximum Fee</i></b>
Underground and Aboveground Storage Tank Facility	\$650	\$650 - \$6,500

### ***Exception Requests***

<b><i>Project</i></b>	<b><i>Fee</i></b>
Exception Request	\$500

### ***Extension of Time Requests***

<b><i>Project</i></b>	<b><i>Fee</i></b>
Extension of Time Request	\$150



TCEQ Use Only

# TCEQ Core Data Form

For detailed instructions on completing this form, please read the Core Data Form Instructions or call 512-239-5175.

## SECTION I: General Information

<b>1. Reason for Submission</b> (If other is checked please describe in space provided.)		
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)		<input type="checkbox"/> Other
<b>2. Customer Reference Number</b> (if issued)		<b>3. Regulated Entity Reference Number</b> (if issued)
CN		RN

[Follow this link to search for CN or RN numbers in Central Registry\\*\\*](#)

## SECTION II: Customer Information

<b>4. General Customer Information</b>		<b>5. Effective Date for Customer Information Updates</b> (mm/dd/yyyy)		
<input checked="" type="checkbox"/> New Customer <input type="checkbox"/> Update to Customer Information <input type="checkbox"/> Change in Regulated Entity Ownership				
<input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)				
<i>The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).</i>				
<b>6. Customer Legal Name</b> (If an individual, print last name first: eg: Doe, John)			<i>If new Customer, enter previous Customer below:</i>	
Nature's Symphony RV Resort, LLC				
<b>7. TX SOS/CPA Filing Number</b>		<b>8. TX State Tax ID</b> (11 digits)		<b>9. Federal Tax ID</b> (9 digits)
0805215018		32091518822		<b>10. DUNS Number</b> (if applicable)
<b>11. Type of Customer:</b>		Partnership: <input type="checkbox"/> General <input type="checkbox"/> Limited		
<input type="checkbox"/> Corporation		<input type="checkbox"/> Individual		
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> Local <input type="checkbox"/> State <input type="checkbox"/> Other		<input type="checkbox"/> Sole Proprietorship <input checked="" type="checkbox"/> Other: LLC		
<b>12. Number of Employees</b>			<b>13. Independently Owned and Operated?</b>	
<input checked="" type="checkbox"/> 0-20 <input type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>14. Customer Role</b> (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following				
<input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator <input type="checkbox"/> Owner & Operator <input type="checkbox"/> Other:				
<input type="checkbox"/> Occupational Licensee <input type="checkbox"/> Responsible Party <input type="checkbox"/> VCP/BSA Applicant				
<b>15. Mailing Address:</b>				
2404 Old Ranch Road 12				
City		San Marcos	State	TX
ZIP		78666	ZIP + 4	
<b>16. Country Mailing Information</b> (if outside USA)			<b>17. E-Mail Address</b> (if applicable)	
			mark@guarrigeneralcontractors.com	
<b>18. Telephone Number</b>		<b>19. Extension or Code</b>		<b>20. Fax Number</b> (if applicable)



**SECTION III: Regulated Entity Information****21. General Regulated Entity Information** (If 'New Regulated Entity' is selected, a new permit application is also required.)
☒ New Regulated Entity    ☐ Update to Regulated Entity Name    ☐ Update to Regulated Entity Information

*The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).*

**22. Regulated Entity Name** (Enter name of the site where the regulated action is taking place.)

Nature's Symphony RV Resort, LLC

**23. Street Address of the Regulated Entity:**

(No PO Boxes)

2404 Old Ranch Rd 12

City

San Marcos

State

TX

ZIP

78666

ZIP + 4

**24. County**

Hays County

If no Street Address is provided, fields 25-28 are required.

**25. Description to Physical Location:****26. Nearest City**

State

Nearest ZIP Code

*Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).*

**27. Latitude (N) In Decimal:****28. Longitude (W) In Decimal:**

Degrees

Minutes

Seconds

Degrees

Minutes

Seconds

**29. Primary SIC Code****30. Secondary SIC Code****31. Primary NAICS Code****32. Secondary NAICS Code**

(4 digits)

(4 digits)

(5 or 6 digits)

(5 or 6 digits)

7033

721211

**33. What is the Primary Business of this entity?** (Do not repeat the SIC or NAICS description.)

RV Park

**34. Mailing Address:**

2404 Ranch Road 12

City

San Marcos

State

TX

ZIP

78666

ZIP + 4

**35. E-Mail Address:**

mark@guarrigeneralcontractors.com

**36. Telephone Number****37. Extension or Code****38. Fax Number** (if applicable)

( 512 ) 856-0754

( ) -

**39. TCEQ Programs and ID Numbers** Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

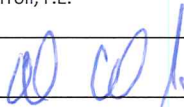
<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source Review Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Wastewater	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

## **SECTION IV: Preparer Information**

<b>40. Name:</b>	Al Carroll P.E., Civil Engineer Manager			<b>41. Title:</b>	
<b>42. Telephone Number</b>	<b>43. Ext./Code</b>	<b>44. Fax Number</b>	<b>45. E-Mail Address</b>		
( 512 ) 440-0222		( ) -	acrarroll@tritechtx.com		

## **SECTION V: Authorized Signature**

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

<b>Company:</b>	Tri-Tech Engineering, L.P.	<b>Job Title:</b>	Civil Engineering Manager
<b>Name (In Print):</b>	Al Carroll, P.E.	<b>Phone:</b>	( 512 ) 440- 2220
<b>Signature:</b>		<b>Date:</b>	8/5/2024