TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

Protecting Texas by Reducing and Preventing Pollution

February 2, 1999

Mr. Tom Schott
SAC-N-PAC Stores, Inc.
1405 United Drive, Suite 115
San Marcos, TX 78666

Re: EDWARDS AQUIFER, Comal County.
PROJECT: SAC-N-PAC Store No. 604, Project number 1129.00, Located on the northeast corner of the intersection of Purgatory Road and Highway 306, Comal County, Texas
TYPE: Request for Approval of Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) §213.5(b); Edwards Aquifer Protection Program

Dear Mr. Schott:

The Texas Natural Resource Conservation Commission (TNRCC) has completed its review of the WPAP application for the referenced project that was submitted on behalf of SAC-N-PAC Stores, Inc., by Stephen Forbes of Forbes Environmental Engineering, Inc. and received by the San Antonio office on November 18, 1998. The WPAP proposed in the application is in general compliance with 30 TAC § 213.5(b); therefore, approval of the plan is hereby granted subject to applicable state rules and the conditions in this approval letter. *This approval expires two (2) years from the date of this approval unless, prior to the expiration date, construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed commercial project will have an area of 1.75 acres and will consist of the construction of a retail gas station and convenience store. Project wastewater for the commercial facility will be treated by a private on-site septic system. According to a November 3, 1998, letter signed by Tom H. Hornseth, Comal County Engineer, the land in the development is acceptable for the use of private sewage facilities. The proposed impervious cover for the development is approximately 0.56 acres (32%). The site is located within the Extra-territorial Jurisdiction of the City of New Braunfels, and must conform with applicable codes and requirements of the City of New Braunfels.

GEOLOGY ON SITE

According to the geologic assessment included with the submittal, two (2) features were identified on the proposed development. The features, identified on the site map as S-1 and S-2, consisted of an existing well

and a closed depression. The well was assessed as having a "possible" sensitivity while the closed depression was assessed as "not" sensitive.

The site investigation performed by the San Antonio office on November 24, 1998, revealed no additional features on the proposed development.

GEOLOGY DOWNGRADIENT OF SITE

No part of the area downgradient of the site was located within the 100-year flood plain, therefore a geology of this area was not conducted.

PERMANENT POLLUTION ABATEMENT MEASURES

The following measure will be taken to prevent pollution of stormwater originating on-site or up-gradient from the project site and potentially flowing across and off the site after construction:

The retention basin is designed in accordance with the LCRA Lake Travis Nonpoint Source Pollution Technical Manual. It is sized to capture the first 0.75 inches of stormwater run-off from 0.56 acres of the parking lot and building. Total capture volume is 1,800 cubic feet. The retention basin will consist of:

1. side slopes of 3:1 for grass stabilized slopes.
2. bypass structure capable of conveying one-hundred year storm.
3. pond will be emptied within 72 hours after the rainfall event by evapo-transpiration and irrigation.
4. the application rate for irrigation should not exceed 0.1 inches/hour and not exceed 12 hours/day.
5. an impervious liner.

Total storage capacity of the retention basin is 1,800 cubic feet. Based on the design criteria application rate of 0.1"/hour for no more than 12 hours per day, the 0.14 acres (6,000 square feet) of vegetated area available for irrigation is sufficient.

One (1) manmade feature on the project site was assessed as being sensitive or possibly sensitive. The permanent pollution abatement measure that will be provided to protect this feature is:

The existing on-site well will remain active and protected by means of a secured pump house. Additionally, OSSF separation distances will be maintained as required by 30 TAC §285--On-Site Sewage Facilities.

SPECIAL CONDITIONS OF APPROVAL

1. If any potential sensitive features are encountered during construction, a geologist shall evaluate the significance of the features. The evaluation shall include representative photographs and a

description of the feature forwarded to the San Antonio office. Construction in the vicinity of the features may only continue with written approval from the TNRCC.

2. Placement of hydrocarbon or hazardous substance storage facilities regulated pursuant to 213.5(d) and 213.5(e), requires submittal of all appropriate applications with appropriate fees and must receive prior approval from the TNRCC.

3. All permanent pollution abatement measures shall be operational prior to completion of construction.

4. The TNRCC may monitor stormwater discharges from the site to evaluate the adequacy of permanent erosion and sedimentation (E&S) control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

5. The proposed on-site sewage facility (OSSF) must be permitted by a local or the state permitting authority prior to commencement of construction.

6. All planning and design materials for the proposed OSSF shall be submitted by a professional engineer or a sanitarian registered in Texas.

7. A site evaluation shall be conducted by a certified site evaluator possessing a valid certificate beginning August 1, 1998. The evaluator shall submit an evaluation report of the site to the San Antonio/Austin Regional Office no later than 30 days from the date of the site evaluation.

8. The following minimum separation distances in feet must be provided between OSSF units and recharge features or possible recharge features:

Sewage Treatment Tanks or Holding Tanks	50
Soil Absorption Systems, & Unlined Evapo transpiration Beds	150
Lined Evapotranspiration Beds	50
Sewer Pipe with Watertight Joints	50
Surface Irrigation Fields	150
Drip Irrigation Fields	100 when $R_4 \leq 0.1$
	150 when $R_4 > 0.1$

9. The proposed OSSF must meet all other requirements found in 30 TAC § 285--On-Site Sewage Facilities.

10. The retention basin shall be equipped with a duplex pump system set to work in a tandem under normal operation, or either pump singularly in the event of failure of one pump.

11. The irrigation cycle shall not exceed twelve (12) hours in any twenty-four (24) hour period and shall be broken into shorter cycles of six (6) hours or less.

12. Irrigation shall be delayed for six (6) hours to allow for soil recovery after a storm event.

13. A finalized site plan indicating the location of the design layout of the sprinkler system shall be shown on the final construction plan and submitted to the TNRCC San Antonio Regional Office prior to commencement of construction.

STANDARD CONDITIONS

1. During the course of regulated activities related to this project, the applicant or his agent shall comply with all applicable provisions of 30 TAC Chapter 213, Edwards Aquifer. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity, upon which that person or entity shall assume responsibility for all provisions and conditions of this approval.

2. Any modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a WPAP to amend this approval, including the payment of appropriate fees and all information necessary for its review and approval.

3. Prior to commencing any regulated activity, the applicant or his agent must notify the San Antonio Regional Office in writing of the date on which the regulated activity will begin.

4. The applicant or his agent shall record this WPAP approval in the county deed records within 30 days of receiving this notice of approval. Proof of deed recordation shall be submitted to the San Antonio Regional Office prior to commencing construction. A suggested format that you may use to deed record the approved WPAP is enclosed.

5. All contractors conducting regulated activities at the project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.

6. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TNRCC may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

7. If any significant recharge feature [sensitive feature] is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the San Antonio Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potential adverse impacts to water quality.

8. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination.

9. Approval of the design of the sewage collection system for this proposed project shall be obtained from the TNRCC prior to commencement of construction of any sewage collection system.

10. One (1) well exists on the site. Any abandoned wells shall be plugged in accordance with 30 TAC § 338 or an equivalent method, as approved by the Executive Director.

    Any drill holes resulting from core sampling on-site or down-gradient of the site shall be plugged with native soil, from the bottom of the hole to the top of the hole, so as to not allow water or contaminants to enter the subsurface environment.

11. Pursuant to §26.136 of the Texas Water Code, any violations of the requirements in 30 TAC §213 may result in administrative penalties.

Should clarification of this letter be desired or if we may be of any other assistance, please contact Tom Gutierrez of our San Antonio Regional office at 210/403-4025. Please reference project number 1129.00.

Sincerely,

Jeffrey A. Saitas, P.E.
Executive Director
Texas Natural Resource Conservation Commission

JAS/TG/eg

Enclosure: Deed Recordation Form

cc: Stephen Forbes, Forbes Environmental Engineering, Inc.
Harry Bennett, City of New Braunfels
Tom Hornseth, Comal County
Greg Ellis, Edwards Aquifer Authority
John Bohuslav, TxDot San Antonio District
TNRCC Field Operations, Austin

FORBES
ENVIRONMENTAL
ENGINEERING, INC.

November 1998

COPY

WATER POLLUTION ABATEMENT PLAN APPLICATION FOR CONSTRUCTION ON THE EDWARDS AQUIFER RECHARGE ZONE

SAC-N-PAC STORE #604
HIGHWAY 306 & PURGATORY ROAD
COMAL COUNTY, TEXAS

FORBES
ENVIRONMENTAL
ENGINEERING

435 Isom Rd., Suite 228
San Antonio, Texas 78216
(210)342-8382; Fax: 344-5407

NOTICE

To: Texas Natural Resource Conservation Commission
Region 13 San Antonio
140 Heimer Road, Suite 360
San Antonio, Texas 78233-5042
(210) 490-3096

Date: November 5, 1998

From: Stephen Forbes, P.E.

Re: Application for Water Pollution Abatement Plan for Construction of Regulated Activities on the Edwards Aquifer Recharge Zone

The attached application is submitted on behalf of Sac-N-Pac Stores, Inc.(SNP) of San Marcos, Texas for the construction of a two underground hydrocarbon storage tanks (UST) and storage for the fuel products. The UST system is to be installed at the 1.75 acre SNP property located at the intersection of State Highway 306 and Purgatory Road, in Comal County, Texas. (See Attached Aerial Map.)

The application fee of $4,000 (SNP Check No.27449 dated11/3/98 made out to the "TNRCC") is submitted as part of this application to the Texas Natural Resource Conservation Commission (TNRCC). The fee covers two USTs($1,000)(applicable application submitted separately and concurrently with this Application), and the Water Pollution Abatement Plan for projects for greater than 1 acre($3,000).

One(1) original and three (3) copies of the Application have been provided. Each copy is laid out in the following order:

Section 1	General Information
Section 2	Geologic Assessment
Section 3	WPAP Application(including Comal County OSSF Site Suitability letter)
Section 4	Temporary Stormwater Plan
Section 5	Permanent Stormwater Plan
Section 6	Agent Authorization Form
Section 7	Fee Form

All documents are certified by a registered professional engineer and signed by applicant where appropriate and as required.

Any questions regarding this application should be directed to Stephen Forbes, P.E. at (210)342-8382 or Mr. Tom Schott of Sac N Pac at (512)392-6484.

The following is a summary each of application sections.

SECTION 1.0 GENERAL INFORMATION

The planned project is to construct a convenience store with fueling capabilities at the intersection of Purgatory Road and State Highway 306 approximately 10 miles north of New Braunfels, Texas in the County of Comal. The project site is 1.75 acres located on the recharge zone of the Edward Aquifer(EARZ). Therefore, a Geologic Assessment, WPAP, and Storm Water Sections are included as part of the Application.

Section 1.0 of the application includes the following attachments:

- General Information Form
- Detailed Description of Proposed Project(summarized below)
- Road Map
- USGS Quadrangle

SECTION 2.0 GEOLOGIC ASSESSMENT

The geologic assessment was performed by a qualified geologist. The Site is located on the EARZ. It is not located within the 100 year flood plain. The assessment identified two potential recharge features onsite S-1 and S-2. The relative infiltration rates for both features are zero. S-1 is water well completed in the Glen Rose formation. It is considered to be a possible sensitive feature with none to low potential recharge capacity. S-2 is a small closed depression determined to be a not sensitive feature with no to low potential recharge capacity .

S-1 is located upgradient of the UST system, but less than 150 feet from the USTs. Therefore, the system tankhold and pipe chase will be lined with an external tertiary liner(see Item 9.0, Section 1.0)

Section 2.0 of the application includes the following attachments:

- Geologic Assessment Form
- Stratigraphic Column
- Site Plan Map
- Site Geologic Map
- Geologic Assessment Table
- Feature Comments

SECTION 3.0 WATER POLLUTION ABATEMENT PLAN APPLICATION FORM

The Water Pollution Abatement Plan(WPAP) applies to the 1.75 acres project site. The total impervious cover, including rooftops and paved surfaces for the proposed construction is 0.56 acres which is 32% of the Site surface area.

The stormwater runoff from the project impervious surfaces will be rain water impacted by surface constituents-if any. The volume of run off will be 1,524 cubic feet for each 0.75 inch of rain.

The wastewater discharge will be an estimated 900 gallons per day based on similar SNP facilities. The only source will be domestic. The waste water will be discharged into an on site sewage facility(OSSF) comprised of an aerobic Hydro-Action treatment system. The system was designed by a registered sanitarian. A letter of site suitability for the proposed system is included(Section 3.0 Item 7.0)

Chemical storage will be typical household products for sale and housekeeping.

SECTION 4.0 TEMPORARY STORMWATER

The temporary stormwater section provides the temporary water pollution abatement measures to be implemented during site construction.

In general, precautions will be taken to minimize impact of construction by appropriately managing surface run off, spills, excavated soils, and construction debris and material.

Stabilized construction rock pad will be placed at the site entrance and exit during construction. Project site and stockpile stormwater run-on and run-off will be filtered through with silt fences. Silt fences will be placed around the onsite geologic features. A temporary silt fence will be placed along the upper embankment of the creek adjacent to the site. An offsite bar ditch along Purgatory Road prevents upgradient stormwater run-on on to the site.

S-1 water well is enclosed in a pump house which is located upgradient and adjacent to the Site pad. Care will be taken to prevent run-off from entering the enclosure. S-2 is not in the drainage pattern of the construction activities, or final operations.

If any geologic features are discovered during construction, construction in the vicinity of the feature will be suspended and the TNRCC regional office will be notified.

Section 4.0 includes the following attachments:

- Fuel servicing practices
- Spoil material management
- Construction material management practices
- Temporary Stormwater Management Site Plan

SECTION 5.0 PERMANENT STORMWATER

The criteria used for the design of the proposed permanent Stormwater Manage Plan(SMP) was from the Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual(effective February 1, 1990 and amended August 12, 1992) referred to a LCRA Technical Manual.

The basic SMP is to prevent run-on by diverting flow around the site in the existing bar ditch along Purgatory Rd. The facility runoff will be collected in a Retention Basin designed to collect the first 0.75 inch of storm water based on calculation methods presented in the LCRA Technical Manual and provided in Application(Section 5.0). Excess storm water above the first 0.75 inch is designed to bypass the basin and discharge into the existing natural drainage.

The collected stormwater will be pumped from the basin to a vegetated area specifically set aside for irrigating with a sprinkler system. The stormwater will be dispersed in 12 hour cycles over a 72 hour period, at an application rate of 0.1 inches per hour in accordance with the LCRA Technical Manual.

The water well(S-1) is enclosed in a pump house structure. The feature(S-2) is not within the facility drainage path.

SECTION 6.0 AGENT AUTHORIZATION FORM

This section provides notarized authorization by the owner of Sac-N-Pac Stores, Inc. for Forbes Environmental Engineering, Inc. to prepare and submit the Application on their behalf.

SECTION 7.0 FEE FORM

New Facility Application Fees Due:

WPAP	1.75 acres	$3,000.00
UST	2 tanks	$1,000.00
Total Due		$4,000.00

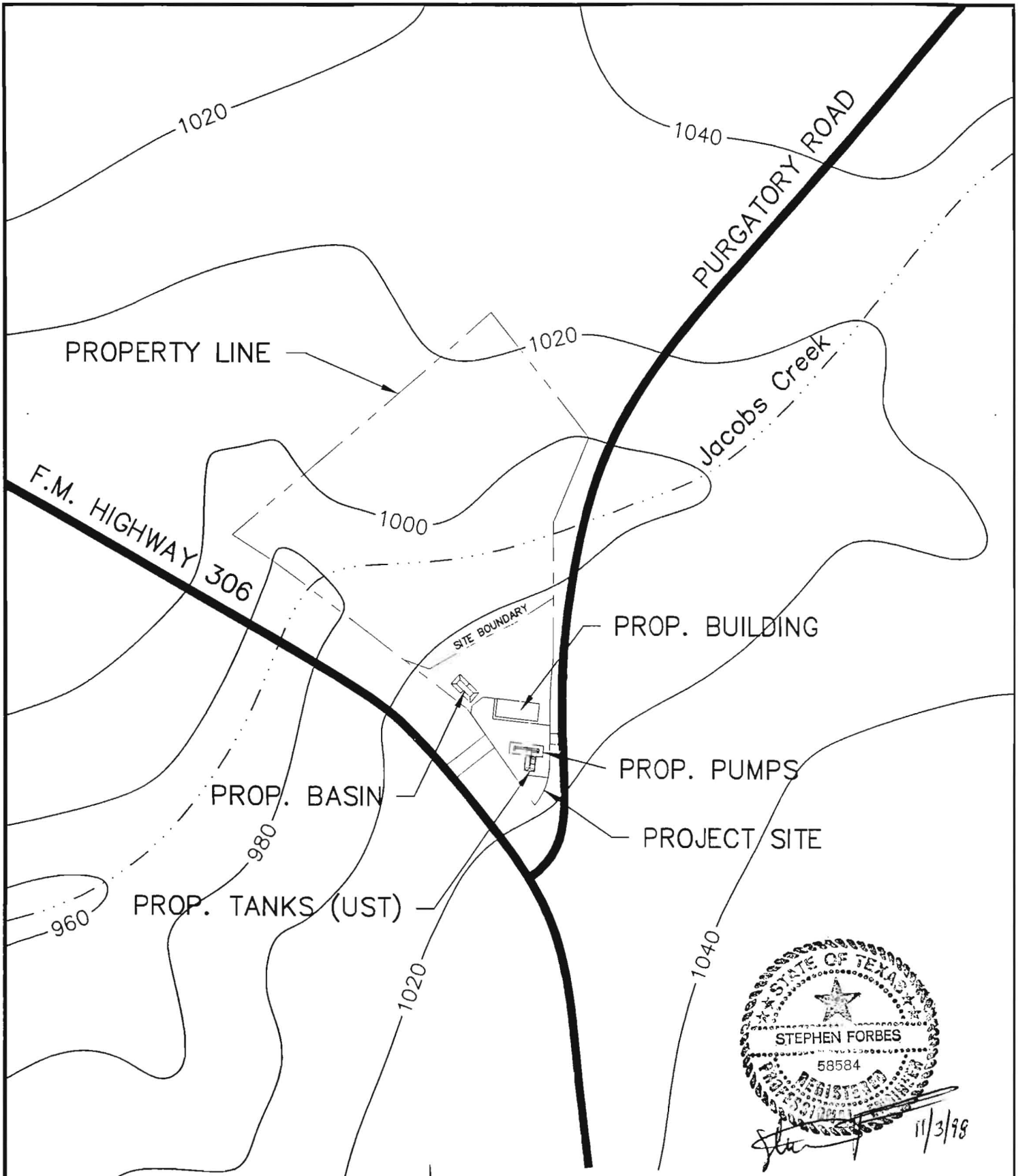
The fees are submitted to San Antonio Regional Office along with the two respective applications which are submitted concurrently.

Certification

"I certify that this document and all the attachments were prepared under my direction or supervision. Based on my inquiry of the person or persons who provided the information herein, the information as submitted, to the best of my knowledge and belief is true and accurate within the scope of the application."

STATE OF TEXAS
STEPHEN FORBES
REGISTERED PROFESSIONAL ENGINEER

Stephen Forbes, P.E. No. 58584



FORBES ENVIRONMENTAL ENGINEERING, INC.

SITE AREAL MAP
SAC–N–PAC
COMAL COUNTY, TEXAS

FIGURE

WATER POLLUTION ABATEMENT PLAN APPLICATION FOR CONSTRUCTION ON THE EDWARDS AQUIFER **RECHARGE ZONE**

for

SAC-N-PAC STORE #604
Highway 306 & Purgatory Road
Comal County, Texas

Prepared for
Texas Natural Resource Conservation Commission
Regional Office 13
San Antonio Texas

On behalf of
Sac and Pac Stores, Inc.
San Marcos, Texas

Prepared By

Stephen Forbes, P.E.
Forbes Environmental Engineering, Inc.
San Antonio, Texas

November 1998

TABLE OF CONTENTS

GENERAL INFORMATION FORM
FOR
REGULATED ACTIVITIES
ON THE EDWARDS AQUIFER RECHARGE ZONE
AND RELATING TO 30 TAC §§213.4 & 213.5, EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: SAC-N-PAC STORE No. 604

COUNTY: COMAL County STREAM BASIN: JACOBS CREEK

TYPE: X WPAP ____ AST ____ EXCEPTION
____ SCS ____ UST ____ MODIFICATION

Do not write in this box. TNRCC use only.	

Received by Region	

Fee Due:	$

Payment Verified:	

Inspection Date:	

Judged Administratively ____ complete ____ incomplete	

Written Comments Received From City/County: UWCD within 30 Days:	__ Yes __ No __ Yes __ No

____ Approved ____ Incomplete and Returned	

APPLICANT INFORMATION

1. Applicant:

Contact Person: MR. TOM SCHOTT
Entity: SAC-N-PAC STORES, INC.
Mailing Address: 1405 UNITED DRIVE, SUITE 115
City, State: SAN MARCOS, TX Zip: 78666
Telephone: (512)392-6494 Fax: (512) 392-6333

2. Agent/Representative (If any):

Contact Person: MR. STEPHEN FORBES, P.E.
Entity: FORBES ENVIRONMENTAL ENGINEERING, INC.
Mailing Address: 435 ISOM ROAD, SUITE 228
City, State: SAN ANTONIO, TX Zip: 78216
Telephone: (210)342-8382 Fax: (210)344-5407

PROJECT LOCATION

3. Site Address: SAC-N-PAC STORE#604
Street: STATE HIGHWAY 306 & PURGATORY ROAD
City: NEW BRAUNFELS, TX Zip: 78132

4. ____ This project is inside the city limits of the City of _____.

__X__ This project is outside the city limits but inside the ETJ (extra-territorial jurisdiction) of the City of NEW BRAUNFELS.

____ This project is not located within any city's limits or ETJ, but is located within _____ County.

5. The location of the project site is described below. Provide sufficient detail and clarity so that the TNRCC's Regional staff can easily locate the project for a field investigation.

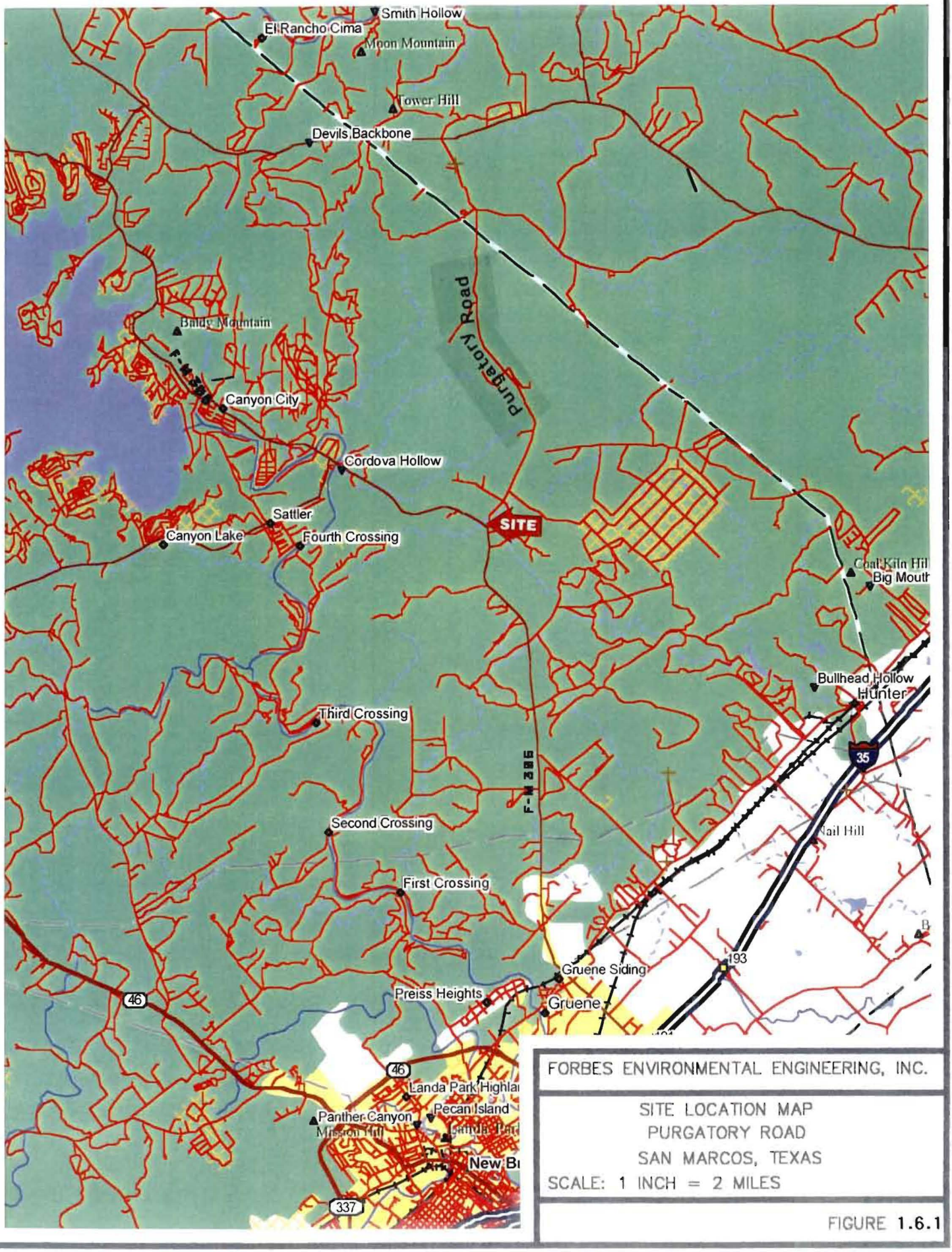
THE PROJECT SITE IS LOCATED AT THE INTERSECTION OF PURGATORY ROAD AND HIGHWAY 306 APPROXIMATELY 10 MILES NORTH OF NEW BRAUNFELS, TEXAS. THE SITE IS THE PROPERTY ON THE NORTHWEST QUADRANT OF THE INTERSECTION.

ROAD AND RECHARGE ZONE MAPS

6. __X__ A **Road Map** is attached behind this sheet showing directions to and location of project site.

7. __X__ A copy of the official 7 1/2 minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached behind this sheet. The map(s) should clearly show:

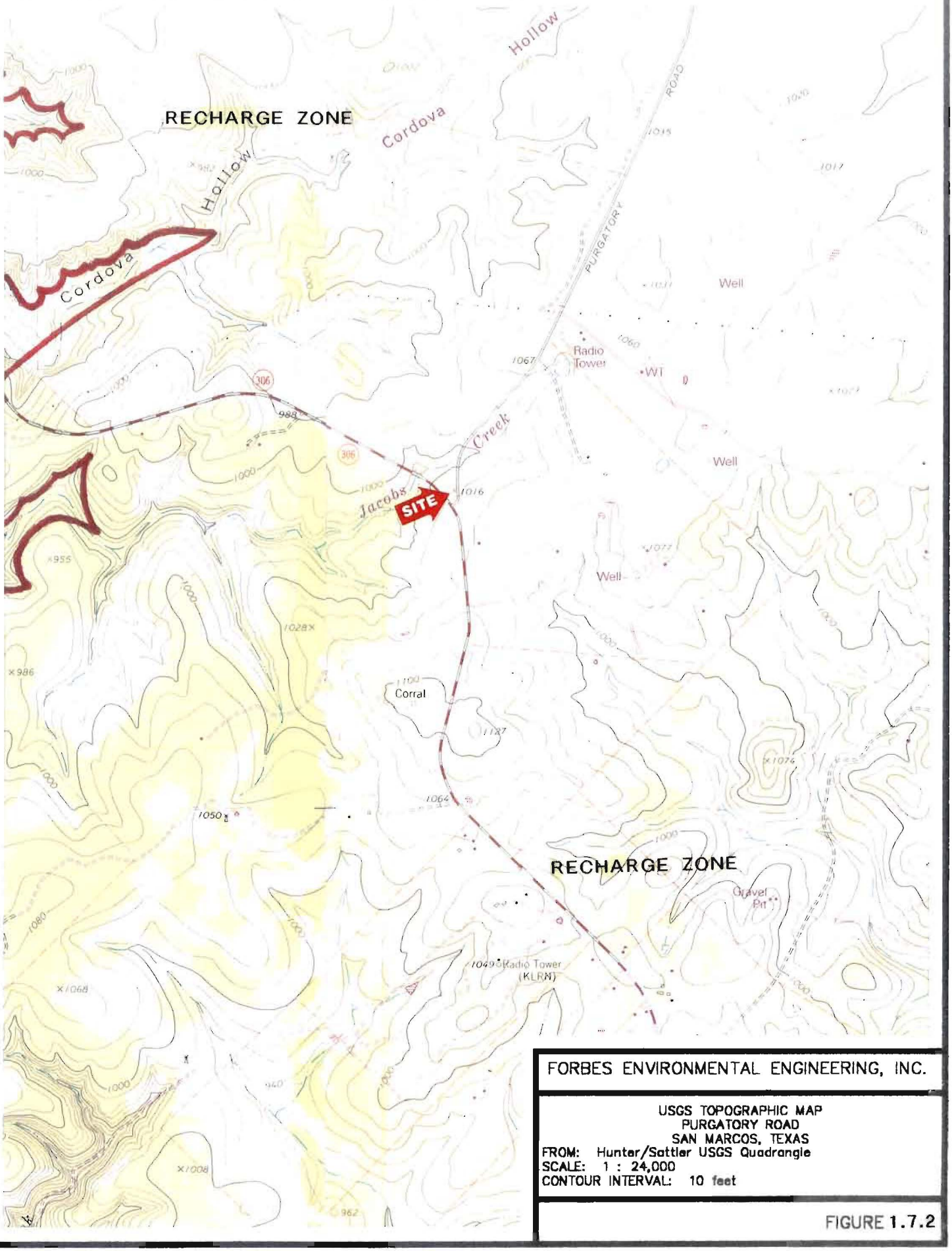
__X__ **Project site.**
__X__ **USGS Quadrangle Name.**
__X__ **Boundaries of the Recharge Zone.**
__X__ **Drainage path from the project to the boundary of the Recharge Zone.**



FORBES ENVIRONMENTAL ENGINEERING, INC.

SITE LOCATION MAP
PURGATORY ROAD
SAN MARCOS, TEXAS
SCALE: 1 INCH = 2 MILES

FIGURE 1.6.1



FORBES ENVIRONMENTAL ENGINEERING, INC.

USGS TOPOGRAPHIC MAP
PURGATORY ROAD
SAN MARCOS, TEXAS
FROM: Hunter/Sattler USGS Quadrangle
SCALE: 1 : 24,000
CONTOUR INTERVAL: 10 feet

FIGURE 1.7.2

Recharge/Transition Zone Maps are available from:
Accugraphics 512/459-4929
Barton Springs/Edwards Aquifer Con. District 512/282-8441
Edwards Aquifer Authority 210/222-2204
Ferguson Map Company 210/829-7629

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

PROJECT DESCRIPTION

9. __X__ A detailed narrative description of the proposed project is provided directly behind this page.

10. Existing project site conditions are noted below:
__X__ Existing commercial site
____ Existing industrial site
____ Existing residential site
____ Existing paved and/or unpaved roads
____ Undeveloped (Cleared)
____ Undeveloped (Undisturbed/Uncleared)
____ Other: _____

SOLID AND HAZARDOUS WASTES

11. Solid wastes and/or hazardous wastes:

____ There are areas of trash, debris or other solid waste and hazardous waste on this property which will be disposed of properly at an authorized facility prior to commencing construction.
__X__ There are no areas of trash, debris or other solid waste or hazardous waste existing on this property.
____ Other. A narrative description is provided directly behind this page.

12. Will there be any on-site land disposal of Municipal Solid Waste as defined in 30 TAC §330?
____ Yes
__X__ No

PROHIBITED ACTIVITIES

13. __X__ 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 §331 of

RESPONSE TO ITEM NO. 9.0

INTRODUCTION

The following is a description of the proposed project to be conducted at Sac-N-Pac Store No. 604, located at the intersection of purgatory road and highway 306 approximately 10 miles north of New Braunfels, Texas. This item includes a description of the Geologic Assessment(Section 2 of the Application), the UST system(Section 3.0 of separate UST Application submitted concurrently), the Water Pollution Abatement Plan Application(Section 3.0, includes OSSF letter of Suitability), construction or temporary storm water management plan (Section 5.0 of this application), and the permanent stormwater management plan(Section 6.0 of WPAP application). Figures are located in the appropriate sections. The Figure numbers indicate the Section, and sequence, respectively.

The "project site"(Site) is defined as a commercial 1.75 acre lot owned by Sac-N-Pac, Inc. Sac-N-Pac plans to install a convenience store with fueling capabilities on the project site as referenced in the UST and WPAP applications. The site figures identify the project site area and show physical features including geologic formation and drainage pathways within the general vicinity of the Site. There is an existing water well onsite which is to be maintained as an active well for irrigation and non drinking water supply. A new water well is planned to be drilled on the adjacent lot as a public drinking water well. The water system will be designed and constructed in accordance with the appropriate and applicable TNRCC regulations {30 TAC §290}.

The Site is located on the Edwards Aquifer Recharge Zone(EARZ) as delineated in the Official Edwards Aquifer Recharge Zone Map (30 TAC 313 Subchapter A) Hunter/Sattler Quadrangle(Figure 1.3). The Site is approximately 0.66 miles southeast of the upper recharge boundary , and approximately 5 miles northwest of the lower boundary. The Site is adjacent to a Jacobs Creek which is is an intermittent basin drainage stream. The Creek crosses the upper EARZ boundary approximately 1. 25 ground miles.

GEOLOGICASSESSMENT

Since the project site is located on the EARZ a Geologic Assessment is required in accordance with 30 TAC §313.4. The assessment was conducted by a qualified geologist on September 1, 1998. The following summarizes the findings of the assessment as presented in Section 2.0 of the Application.

The site is located entirely within the recharge zone of the Edwards Aquifer. No downgradient assessment of geology was performed since the 100 year flood zone is not located in the downgradient area. Stratigraphically the site appears to be located within the Dolomitic member of the Edwards Group, Kainer Formation.

During the site geologic investigation two site features were mapped(see Figure 2.1). Feature S-1 is an on-site water well and feature S-2 is a small closed depression. S-1 is completed in the Glen Rose formation. It was identified as being a possible sensitive feature with no or low potential recharge capacity.

Feature S-2 measures approximately 5 foot by 6 foot with 1.5 to 2.5 foot of relief. No significant openings to the subsurface were located in association with this feature. This feature was determined not to be sensitive with no or low potential recharge capacity.

Several animal burrows in and around rocks were noted on-site. These features were not mapped as recharge features due to their small size and lack of apparent connection to the subsurface. The northern boundary of the site is the southern bank of a drainage creek. The creek bed which lies offsite may represent a fault.

In general, the site has significant soil and vegetation cover with some rock outcrop along the creek bank. Most of the outcrop had too much soil and vegetation cover to assess the amount of "in-place rock" versus "float rock". During site grading and tankhold construction activities additional exposure of lithologic features may occur. The tankhole will be assessed for potential recharge features prior to tank placement, and if discovered the TNRCC will be notified, and construction terminated until appropriate action taken.

UST SYSTEM

In general, the design of UST facilities will meet or exceed the technical standards of Subchapter C of 30 TAC 334 regarding for the installation of new petroleum underground storage tanks, as well as 30 TAC 313 relating to the Edwards Aquifer Recharge Zone.

The specific applicable regulations are cited in each pertinent section of Item 5.O of Section 3.0, which also includes a complete equipment and corresponding figures. The following is summarizes the UST system design.

TANK DESIGN

The proposed new UST system will consist of two new double-wall composite Fiberglass Reinforced Plastic(FRP). The tanks will be equipped with a factory-applied external 100 mils fiberglass wrap. Both tank sizes will be 15,000 gallons. Tank 1 will store unleaded gasoline. Tank 2 will consist of two compartments with 8,000 gallon and 7,000 gallon capacities which will store super unleaded gasoline and diesel fuel respectively. Crushed rock will be used for tank bedding and tank hole backfill. Due to the presence of a water well within 150 feet upgradient of the UST system, an external liner is to be installed in the tankhold and pipe chase. The liner is to be fabricated of 20mil NPVC material supported with a geotextile fabric. The liner will be prefabricated to fit the tankhold without any open seams.

FILL TUBE WITH OVERSPILL PREVENTION

The tank fill for each tank will be protected with overspill prevention provided by an automatic shut-off valve set to shut off flow into the tanks when the volume of fuel in the tank reaches 95% of the tank capacity. A 5 gallon spill containment manhole will be fitted on each fill tube at the surface. The drop tube is a complete assembly which includes the automatic shut off valve, a tight-fill fitting and liquid tight lid.

VAPOR VENT SYSTEM

Vapors will be vented from the tanks through an extractor valve located on the vapor recovery riser. The tank vent riser will be equipped with liquid tight cap and adapter). All the vapor recovery lines will be single wall 2" FRP pipe to the vent riser. The vent lines from the gasoline storage tanks will be connected into a common manifold. The diesel tank will have a separate vent line which will run parallel with the gasoline vapor manifold. The gasoline and diesel vent lines will connect to separate risers near the respective pump islands. The risers will be 2" schedule 40 galvanized pipe. The risers will be coupled to the FRP vent line with double 90° galvanized swing coupling fitted with a FRP to pipe thread adapter. A pressure vacuum vent will be threaded on top of the gasoline vapor riser to maintain the required pressure in the storage tanks and prevent vapor loss. The diesel vapor riser will be outfitted with an open vent.

TANK INVENTORY GAUGE

Each tank will be equipped with an automatic product level monitoring system and tied into the central monitoring system as discussed under leak detection system.

PRODUCT PUMP AND PIPING SYSTEM

Each gasoline storage tank will be equipped with a 1.5 horse power, 4-inch diameter submersible pumps. The diesel tank will be equipped with a 3/4 horsepower pump. All product lines will be double wall FRP consisting of a 2" diameter primary pipe and 3" diameter secondary containment pipe. The slope of the product delivery lines will be 1/8" per foot in the direction of the tank. A safety shear/impact valve will be installed on each product line at the dispenser island to assure automatic shut-off of product flow during emergencies. Stainless steel braided flexible connectors will be used to connect the product line to the dispenser unit and to connect the product line to the submersible pump. Each connector will be placed in liquid tight secondary containment sump as discussed under Corrosion Protection Method.

INTERSTITIAL TANK PROBE

An interstitial tank probe will be installed in the monitoring space between the outer FRP wall and inner steel wall located at the end of each tank. The probes will consist of liquid discrimination sensors to detect any liquid which may have intruded into the secondary confined space.

CORROSION PROTECTION METHOD

The primary corrosion protection method is to use FRP for the tanks and product lines as described above. The submersible pump housings and pump end flexible connectors will be placed within a liquid tight high density polyethylene secondary containment sump. The dispenser end flexible connector will also be placed in a liquid tight high density polyethylene secondary containment

sump. The sumps will provide isolation from the corrosive elements of the backfill material while also providing secondary containment for any leaks from the enclosed components. All metal parts exposed to backfill soils will be wrapped with dielectric tape. This includes: the vapor recovery riser at the tank, the below grade vent riser, the fill tube riser, the interstitial tank probe riser, and the automatic tank gauge system riser.

LEAK DETECTION SYSTEM

Each tank will be equipped with a liquid sensor probe installed in the interstitial space between the walls of the double wall tanks, and an automatic tank gauging probe as discussed above.

Each product piping system will be monitored by a liquid discrimination sensor located adjacent to the submersible pump in the secondary containment sump. The product lines will be equipped with an automatic electronic positive flow shut-off sensor designed to stop product flow in the event of a leak, and perform continuous leak detection tests.

All the tank probes and sensors will be connected to a multi-channel central programmable control unit placed in the store building and will provide visual and audible alarms when hydrocarbon liquids, and water is detected. This system will combine tank inventory monitoring and in-tank leak detection.

Two 4-inch diameter slotted(0.020 inches) PVC observation wells will be placed in diagonal corners of the tank pit to detect fuel spills and vapors in the backfilled tank hole area within 35 days. The wells will be installed to a depth of 2 feet below the bottom of the tank to an approximate depth of the 15'.

Each tank riser and observation well will be covered with an appropriate access vault or ("street box") properly covered and designed to divert surface runoff away from the manways.

Temporary Stormwater Management Plan(TSMP)

The Temporary Stormwater management plan is included in Section 4.0 of both the UST and WPAP applications..
The following summarizes the construction storm water management practices to be implemented during construction and before a permanent system is in place. Figure 4.1 and 4.2 in Section 4.0 show the plan detail.

The UST surface area will be covered with concrete, and the new store access and parking areas will be covered with asphalt. Precautions will be taken to contain and collect any wash off from the surfaced area during an intermittent rain. Other than portable containers five gallons or less, equipment fuel will not stored on Site, and equipment will be serviced by offsite vehicles. Care will be taken to minimize spillage and any spills which do occur will be addressed immediately. Construction debris and material will be placed in onsite disposal containers, and disposed in an approved landfill. Excavated soils will be placed in designated stockpile area and enclosed by silt filter fence. The soils will be used on Site for fill and berms-if suitable. Excess soils will be shipped to an appropriate disposal facility.

Site access and egress will be over a stabilized construction entrance/exit. Run on will be prevented from entering the construction areas by installing temporary berm above the construction area. Silt fencing will be placed downgradient of the entire construction area to treat stormwater runoff that may be impacted by the activities. Silt fencing will be placed across the bar ditch at the northwest corner of the property as a secondary backup filter, to assure final discharge adequately treated. The fencing will not be placed to intercept runoff that is not affected by construction activity.

PERMANENT STORMWATER MANAGEMENT PLAN

The project site permanent storm water management plan(SMP) is based on the design criteria for a Retention Basin and irrigation system taken from the Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual dated February 1, 1990 and amended August 12, 1992(referred to as "LCRA Technical Manual"). The calculations and figures are located in the Permanent Storm Water Section(i.e. Section 5.0).

The project site does not receive a significant amount run-on from the upgradient areas due to diversion of run-on by bar ditches along Purgatory Road.

The stormwater from the new facility pad will be diverted by slope design and elevations to converge at the site discharge point in the northwest corner of surfaced area(see Figure 5.1). The converged runoff will be dissipated by a saw tooth

curb and flow into a grated catchment drain box. An 8" Schedule 40 PVC drain pipe will convey the flow from the box into the retention basin located in the north east corner of the project site. The retention basin is designed to collect the first 0.75" of rain from the new facility impervious surface based on the LCRA Technical Manual guidelines using 30% impervious cover for the project site, and 75% reduction of potential pollutant loads. The new facility surface area is calculated to be 24,389 square feet. Therefore, the first 0.75"(0.0625 ft) of rain will produce 1,800 cubic feet of storm water or 13,464 gallons, which is the design capacity of the retention basin from the top(soffit) of the inlet drain pipe, plus an additional one foot freeboard.

The excess storm water above the design capacity will diverted from the basin via an 8" 'T' with a branch extension to the natural drainage to the west of the site. The invert elevation of the branch pipe at the bar ditch will be set at the soffit elevation of the line pipe. Flow carried from new facility impervious cover via the line pipe will flow into the basin until the elevation differential is overcome at it design capacity. The 8" drain pipe is used to handle a 100 year storm in accordance with the LCRA Technical Manual, which is equivalent to approximately 2 cubic feet per second (cfs) for the impervious cover.

Irrigation System

The retention basin will drain via 4" Schedule 40 PVC pipe into a lift station outfitted with a small(1/3 to 1/2 hp) submersible pump. After the rain event the collected water will be pumped from the lift station through a one(1) inch forced main to a sprinkler system which irrigates a dedicated vegetated area set aside specifically for this use. All the water will be pumped out within 72 hours and in 12 hour cycle times at a rate of 6.2 gpm in order not to exceed the 0.1 inch per hour application rate in accordance with the LCRA Technical Manual. The necessary irrigation area requirement is 6,000 square feet. There is more area available.

PURGATORY ROAD

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE

S-1

RAILROAD TIE PLATFORM

SHED

1015

1010

LOG CABIN

S-2

SITE BOUNDARY

1005

25' BUILDING SETBACK

1000

SITE BOUNDARY

EDGE OF PAVEMENT

F.M. HIGHWAY 306

N

0 40 80

(SCALE IN FEET)

E

E

E

STATE OF TEXAS

STEPHEN FORBES

58584

REGISTERED PROFESSIONAL ENGINEER

11/3/98

FORBES ENVIRONMENTAL ENGINEERING

EXISTING SITE PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 1.9.3

PURGATORY ROAD

EDGE OF PAVEMENT

PROPOSED SEPTIC SYSTEM

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE

S-1

PUMP DISPENSER ISLAND (GAS)

CANOPY

MONITOR WELL

8000 GAL. TANK (SUPER)

PROPOSED COMMERCIAL BUILDING

V

D

U

S

V

7000 GAL. TANK (DIESEL)

MONITOR WELL

S-2

SEPTIC IRRIGATION AREA

SITE BOUNDARY

1015

1014

1013

1012

1011

1010

1009

1008

1007

1005

1000

25' BUILDING SETBACK

10' UTILITY EASEMENT

HIGHWAY RIGHT-OF-WAY

EDGE OF PAVEMENT

PROPOSED RETENTION BASIN
(1,800 CU. FT. CAPACITY)

RETENTION BASIN IRRIGATION AREA

SITE BOUNDARY

F.M. HIGHWAY 306

N

0 40 80
(SCALE IN FEET)

MAP LEGEND

➡ = Site Pad Drainage

● S-1 = Geologic Feature
Existing Water Well
None/Low Potential
Recharge

● S-2 = Geologic Feature
Closed Depression
None/Low Potential
Recharge

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED
ENGINEER
11/3/98

FORBES ENVIRONMENTAL ENGINEERING, INC.

FINISHED SITE PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 1.9.4

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).

14. N/A 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 §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

15. Under 30 TAC §213.14, application fees are due and payable at the time the application is filed. I understand that if the correct fee is not submitted, the TNRCC 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:

____ Austin central office

____ Austin regional office (for projects in Hays, Travis, and Williamson Counties)

__X__ San Antonio regional office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

16. __X__ One (1) original and three (3) copies of the completed application shall be submitted to the appropriate Regional Office for distribution by the TNRCC to the local municipality or county, groundwater conservation districts, and the TNRCC's Central Office.

17. __X__ All items required for this development, as listed in the **APPLICATION GUIDELINES**, are attached.

18. As applicant for the proposed project I am aware that:

__X__ **It is the applicant's responsibility to use the current TNRCC Edwards Aquifer application forms.**

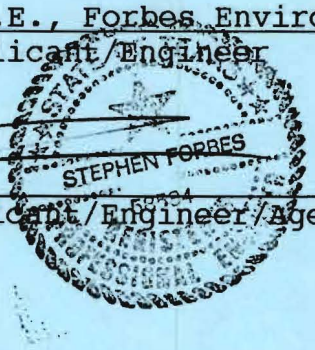
__X__ The executive director must declare that the application is administratively complete or deficient within 30 days of receipt by the appropriate regional office and must complete

the review of an application within 90 days after determining that it is administratively complete. Grounds for a deficient application include, but are not limited to, failure to pay all applicable application fees.

__X__ No person shall commence any regulated activity until a Water Pollution Abatement Plan for such activity has been filed with and approved by the TNRCC.

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 TNRCC review. The application was prepared by:

STEPHEN FORBES, P.E., Forbes Environmental Engineering, Inc.
Print Name of Applicant/Engineer



Signature of Applicant/Engineer/Agent

11/3/98
Date

GEOLOGIC ASSESSMENT

FOR

REGULATED ACTIVITIES

ON THE EDWARDS AQUIFER RECHARGE/TRANSITION ZONES
AND RELATING TO 30 TAC §213.5(b)(3), EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: Purgatory Road Sac-N-Pac Store

TYPE OF PROJECT: ____ WPAP ____ AST ____ SCS __x__ UST

PROJECT INFORMATION

1. Project is on the: __x__ Recharge Zone ___ Transition Zone ___ Both

Recharge Zone Boundary:

____ The Recharge Zone boundary is located on-site. **This Geologic Assessment includes a description of the geologic or manmade features identified on-site.**

____ The Recharge Zone boundary is located within the downgradient area.

__x__ The Recharge Zone boundary is not located within the downgradient area.

2. **100-year floodplain boundaries:**

____ The 100-year floodplain is located on-site. **This Geologic Assessment includes a description of the geologic or manmade features identified on-site and within the 100-year floodplain downgradient of the site for a distance of one-half mile or to the Recharge Zone boundary, whichever is less.**

____ The 100-year floodplain is located downgradient of the site within a distance of one-half mile or the Recharge Zone boundary, whichever is less. **This Geologic Assessment includes a description of the geologic or manmade features identified on-site and within the 100-year floodplain downgradient of the site for a distance of one-half mile or to the Recharge Zone boundary, whichever is less.**

__x__ No part of the area downgradient of the site is located within the 100-year floodplain. **This Geologic Assessment includes a description of the geologic or manmade features identified on-site.**

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s):
FIRM, Comal County Texas & Unincorporated Areas, Panel No. 4854630090 C, September 29, 1986.

3. ____ This project is part of a multi-phase project. The Geologic Assessment is site specific and covers only that area undergoing review at this time.
__x__ This is not a multi-phase project.

4. __x__ Geologic or manmade features are described and evaluated using the attached GEOLOGIC ASSESSMENT TABLE.

5. Soil cover on the project site is __0 - 1.5__ feet thick. In general, the soil present appears to have the ability to:

____ transmit fluid flow to the subsurface.
__X__ impede fluid flow to the subsurface.

6. __x__ A **stratigraphic column(s)** is attached **directly behind this page.** The outcropping unit is at the top of the stratigraphic column.

7. __x__ A narrative description of the site specific geology for this project is provided directly behind this page.

8. __x__ Appropriate Geologic Map(s) are provided:

SITE GEOLOGIC MAP

The Site Geologic Map must be the same scale as the applicant's Site Plan.

Applicant's Site Plan Scale 1" = __40__ '

Site Geologic Map Scale 1" = __40__ '

Items 9 through 13 must be included on the Site Geologic Map.

9. __x__ The Project Site is shown and labeled.

10. __x__ Surface Geologic Units are shown and labeled.

11. **Geologic or manmade features.**

__X__ 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.

Purgatory Road
Sac-N-Pac
Stratigraphic Column

Lower Cretaceous	Edwards Group	Kainer Formation	Dolomitic Member (Exposed at Site Surface)	110 – 130 feet maximum thickness
			Basal Nodular Member	50 – 60 feet maximum thickness
	Glen Rose	Upper Glen Rose	Upper Glen Rose Formation (Lower Confining Unit)	350 – 500 feet maximum thickness

Column based on field assessment and Small and Hansen 1994.

Purgatory Road
Sac-N-Pac
Site Narrative for Geologic Features

This site is located entirely within the recharge zone of the Edwards Aquifer. No downgradient assessment of geology was performed since the 100 year flood zone is not located in the downgradient area. Stratigraphically the site appears to be located within the Dolomitic member of the Edwards Group, Kainer Formation (Small & Hanson 1994). This is based upon the presence of burrowed limestone and the presence of chert. In addition the presence of iron staining in some of the site lithology was noted. Although iron stains are often associated with the Leached Collapsed member of the Edwards, site investigation and personal communication with Ted Small – USGS, concerning this site indicate the Dolomitic member is the outcropping unit for the site.

During the site geologic investigation two site features were mapped. Feature S-1 is an on-site water well and feature S-2 is a small closed depression, possibly indicative of a incipient sinkhole. Although no well log was available, feature S-1 is reportedly a Glen Rose Well. This seems quite likely since the total stratigraphic thickness of the Edwards on-site is estimated at 100 to 190 feet and the Dolomitic and Basal Nodular members are not likely water bearing units in this setting. Feature S-2 measures approximately 5 foot by 6 foot with 1.5 to 2.5 foot of relief. No significant openings to the subsurface were located in association with this feature. Although not found, or noted on the site geologic map, it appears probable a septic system may exist on-site associated with an existing on-site building (planned for removal from the site). If present, the septic system should be removed from the site during site construction activities.

Several animal burrows in and around rocks were noted on-site. These features did not warrant mapping as recharge features due to their small size and lack of apparent connection to the subsurface. The northern boundary of the site is the southern bank of a drainage (dry creek bed) that traverses in an approximate east-west direction north of the site. Although not mapped as a site feature due to its apparent off-site location, this creek may represent a fault mapped by Small and Hanson 1994.

The site in general has significant soil cover and vegetation cover, with some rock outcrop along the creek bank. Most of the outcrop observed had enough soil and vegetative cover to make assessing the amount of "in-place rock" versus "float rock" somewhat difficult. During site grading and tankhold construction activities additional exposure of lithologic features may occur. The tankhold will be assessed for potential recharge features prior to tank placement.

12. ____ The Recharge Zone boundary and the 100-year floodplain is shown and labeled, if appropriate.

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

__x__ There are __1__ (#) 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.
- __x__ The wells are in use and comply with 30 TAC §238.

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

DOWNGRADIENT GEOLOGIC MAP *

Downgradient Geologic Map Scale 1" = __n/a__ '

No downgradient investigation was performed since the floodplain does not exist within the ½ mile downgradient limit.

Items 14 through 16 must be included on the Downgradient Geologic Map.

14. __n/a__ Surface Geologic Units are shown and labeled.

15. **Geologic or manmade features:**

__n/a__ Geologic or manmade features were discovered within the downgradient area. They are shown and labeled on the Downgradient Geologic Map and described in the attached Geologic Assessment Table.

__n/a__ No geologic or manmade features were discovered within the downgradient area.

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

__n/a__ 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 30 TAC §238.

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

ADMINISTRATIVE INFORMATION

17. __X__ One (1) original and three (3) copies of the following forms, in the order listed below, have been provided.
    * **THIS FORM**
    * **GEOLOGIC ASSESSMENT TABLE**
    * **SITE GEOLOGIC MAP**
    * **DOWNGRADIENT GEOLOGIC MAP, if needed**

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 **GEOLOGIC ASSESSMENT** is hereby submitted for TNRCC review. The application was prepared by:

Date(s) Geologic Assessment was performed: 9/1/98
Date(s)

J. MARK HAMILTON — 210-271-0925
Print Name of Geologist — Telephone

210-271-3061
FAX

[signature] — 9/11/98
Signature of Geologist — Date

Representing: EARTH TECH, INC.
(Name of Company)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Purgatory Road Sac-N-Pac

FEATURE ID			FEATURE CHARACTERISTICS																											PHYSICAL SETTING													
1A	1B	1C	2	3			4			5	6		7			8			9				10			11	12			13				14					15	16			17
LOCATION	TYPE (1)	POINTS	GEOLOGIC FORMATION	VERTICAL FEATURE (FEET)			HORIZONTAL FEATURE (FEET)			LENGTH & WIDTH (FEET)	TREND (C, CD, FR, FZ, SC, SH)		DENSITY (FR, VF)			APERTURE (FR, VR)			INFILLING (CD, FR, FZ, SC, SH, VR)				RELATIVE INFILTRATION RATE			SUB-TOTAL	SENSITIVITY			DRAINAGE AREA (ACRES)				TOPOGRAPHY (2)					SUB- TOTAL	POTENTIAL RECHARGE			COM-MENTS
				C, CD, SC, SH			C, SC			FZ, FR, VR, Z		10	0	5	10	0	5	10	0	5	10	15	0	10	30					0	5	10	15	0	5	10	15	20					
				X	Y	Z	X	Y	Z		DIRECTION	DOMINANT	LOW	MODERATE	HIGH	SMALL	MEDIUM	LARGE	CEMENTED	FINE	COARSE	NONE	NONE/LOW	MODERATE	HIGH		NOT	POSSIBLE	SENSITIVE	<1	<10	<50	>50	WALL	HILLTOP	HILLSIDE	FLOOD PLAIN	STREAM BED		NONE/LOW	MODERATE	HIGH	YES
																											<25	25 - 60	>60											<15	15 -20	>20	
S-1	MM	35	Kek																							35		35			5					10			15	15			YES
S-2	CD	10	Kek	5	6	1.5														5			0			15	15				5					10			15	15			YES

(1) C = 35, CD = 10, FR = 0, FZ = 15, MM = 35,
SC = 10, SH = 20, VR = 0, ZONE = 35

(2) WALL = Vertical/near veritical wall above 100-yr floodplain
FLOODPLAIN = 100-yr floodplain
STREAM BED = Ordinary High Water Mark

TNRCC - 0629 (2/1/97)

I have read, understood, and followed the Texas Natural Resource Conservation Commission's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.

[signature] 9/11/98

Geologist signature Date

Sheet 1 of 1

PURGATORY ROAD

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE

S-1

RAILROAD TIE PLATFORM

SHED

1015

1010

LOG CABIN

S-2

SITE BOUNDARY

JACOBS CREEK

Kek-D

1005

25' BUILDING SETBACK

1000

Kek-D

EDGE OF PAVEMENT

F.M. HIGHWAY 306

N

SITE BOUNDARY

E

E

E

0 40 80

(SCALE IN FEET)

MAP LEGEND

Kek-D = Kainer Formation Dolomitic Member

● S-1 = Site Feature 1 Glen Rose Water Well

● S-2 = Site Feature 2 Closed Depression

Flow Arrow = ←

STATE OF TEXAS

STEPHEN FORBES

58584

REGISTERED PROFESSIONAL ENGINEER

11/3/98

FORBES ENVIRONMENTAL ENGINEERING, INC.

SITE GEOLOGICAL MAP
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE **2.8.1**

Purgatory Road
Sac-N-Pac
Additional Comments for Geologic Features

Feature S-1: A water well, depth not know, however, reported to be a Glen Rose (Trinity Aquifer) well, not an Edwards Aquifer well. This seems probable, since the Edwards limestones in the site setting are not likely water bearing units.

Feature S-2: A small closed depression along the northern site boundary just inside of the tree line. The feature may represent an incipient sink-hole, or collapse feature. No significant conduit to the subsurface was apparent during the investigation of this feature.

View of intersection of State 306 and Purgatory Road
view is to the south along southern site boundary

View of site looking to the north-northwest

View of site to the north - along the eastern site boundary

View of site to the north - along the western site boundary

View of site feature S-2, a small closed depression

View of tree line along northern portion of site. Feature S-2 is located inside of tree line on right hand side of photo

Purgatory Road
Sac-N-Pac
List of References

Federal Emergency Management Agency, (1991), *FIRM Flood Insurance Rate Map, Comal County, Texas and Unincorporated Areas*, Panel No. 485493 0090 C, September 29, 1986.

Small, Ted A. – Personal communication – September 8, 1998.

Small, Ted A. and Hanson, John A., (1994), *Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Comal County, Texas*, Water Resources Investigations Report 94-4117.

WATER POLLUTION ABATEMENT PLAN APPLICATION

FOR

CONSTRUCTION OF REGULATED ACTIVITIES
ON THE EDWARDS AQUIFER RECHARGE ZONE
AND RELATING TO 30 TAC §213.5(b), EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: SAC-N-PAC STORE #604

PROJECT INFORMATION

1. The type of project is:
   ____ Residential: # of Lots: _____
   ____ Residential: # of Living Unit Equivalents: _____
   __X__ Commercial
   ____ Industrial
   ____ Other: _____

2. Total Acreage (Size of project): 1.75

3. Projected population: None

4. The amount and type of impervious cover is shown below:

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	5,968	÷ 43,560 =	0.137
Parking/Paved Surfaces	18,421	÷ 43,560 =	0.423
Other:	0	÷ 43,560 =	0
Total Impervious Cover	24,389	÷ 43,560 =	0.560
Total Impervious Cover ÷ Total Acreage x 100 =			32 %

STORMWATER TO BE GENERATED BY THE PROPOSED PROJECT

5. A description of the character and volume of the stormwater runoff which is expected to occur from the proposed project is attached directly behind this page.

RESPONSE TO SECTION 3.0 ITEM 5

The stormwater runoff from the store operations area will be from the impervious site cover, including the paved driveway and parking areas, and the store and canopy roofs. The volume of run off from this area for the first 3/4 inch of rain is 1,800 cubic feet or 13,464 gallons(see Section 5.0 pertaining to permanent storm water plan calculations).

Run-off from the rest of the site will be sheet flow from direct precipitation on the soils cover.

There will be minimal run-on to the site as a whole, since the upgradient flow is intercepted by bar ditches along Purgatory road.

WASTEWATER TO BE GENERATED BY THE PROPOSED PROJECT

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

X	% Domestic	900	gallons/day
	% Industrial		gallons/day
	% Commingled		gallons/day
	TOTAL	900	gallons/day

7. Wastewater will be treated by:

X On-Site Sewage Facility (OSSF/Septic Tank):
An on-site sewage facility will be used to treat and dispose of the wastewater. The **appropriate licensing authority's written approval is attached directly behind this page.** It states that the land is suitable for the use of an on-site sewage facility or identifies areas that are not suitable.

X I verify that 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 registered engineer or sanitarian and installed by a licensed installer in compliance with 30 TAC §285.

N/A Sewage Collection System (Sewer Lines):

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

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

N/A The SCS was previously submitted on _____.

N/A The SCS was submitted with this application.

N/A 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 N/A (name) Treatment Plant. A letter from the owner of the Treatment Plant indicating that the plant has sufficient capacity and accepting the wastewater is attached directly behind this page.

8. N/A All private service laterals will be inspected as required in 30 TAC 213.5(c)(3)(I).

Comal County

OFFICE OF COMAL COUNTY ENGINEER

November 3, 1998

Sac 'N' Pac Store
Sac 'N' Pac, Inc.
1405 United Drive, Ste. 115
San Marcos, TX 78666

Re: Lot 48B, Eden Ranch, Section II, within Comal County, Texas

Dear Property Owner(s):

We have completed the field inspection of the referenced for the recommendation for private sewage facilities and have found the property to be approved with the condition that individual septic systems permits shall be required for this property.

Please be advised that these individual permits will be required to meet 30 TAC 285.40, SubChapter E. (copy attached) Please specifically reference the one acre minimum lot size and 150 foot distance requirement to recharge features.

Should you have any questions, please feel free to contact us.

Sincerely,

Thomas H. Hornseth, P.E.
Comal County Engineer

195 David Jonas Drive • New Braunfels, Texas 78132-3760 • (830) 608-2090 FAX (830) 608-2009

SITE PLAN

Items 9 through 16 must be included on the Site Plan.

9. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = 40 '.

10. X **Layout of the development** (Location of lots, recreation centers, buildings, roads, etc.) is shown and labeled.

11. X A narrative description of any on-site chemical storage is provided directly behind this page.

12. **Geologic or manmade features** which are associated with this project:

X All **geologic or manmade** features identified in the Geologic Assessment are shown and labeled. Features associated with this project are those located on-site and those located either one-half mile downgradient or to the Recharge Zone boundary, whichever is shorter, and within the 100-year floodplain. **{Note: Site is not in 100 year flood plain.}**

____ **No geologic or manmade features** were identified in the Geologic Assessment.

____ A Geologic Assessment is not required; however, **geologic or manmade** features were found and are shown and labeled.

____ A Geologic Assessment is not required and no **geologic or manmade** features were found.

13. X Existing topographic contours are shown and labeled. The contour interval is 1 feet. (Contour interval must not be greater than 5 feet).

14. X **Finished topographic contours** are shown and labeled. The contour interval is 1 feet. (Contour interval must not be greater than 5 feet).

____ Finished topographic contours will not differ from the existing topographic configuration and are not shown.

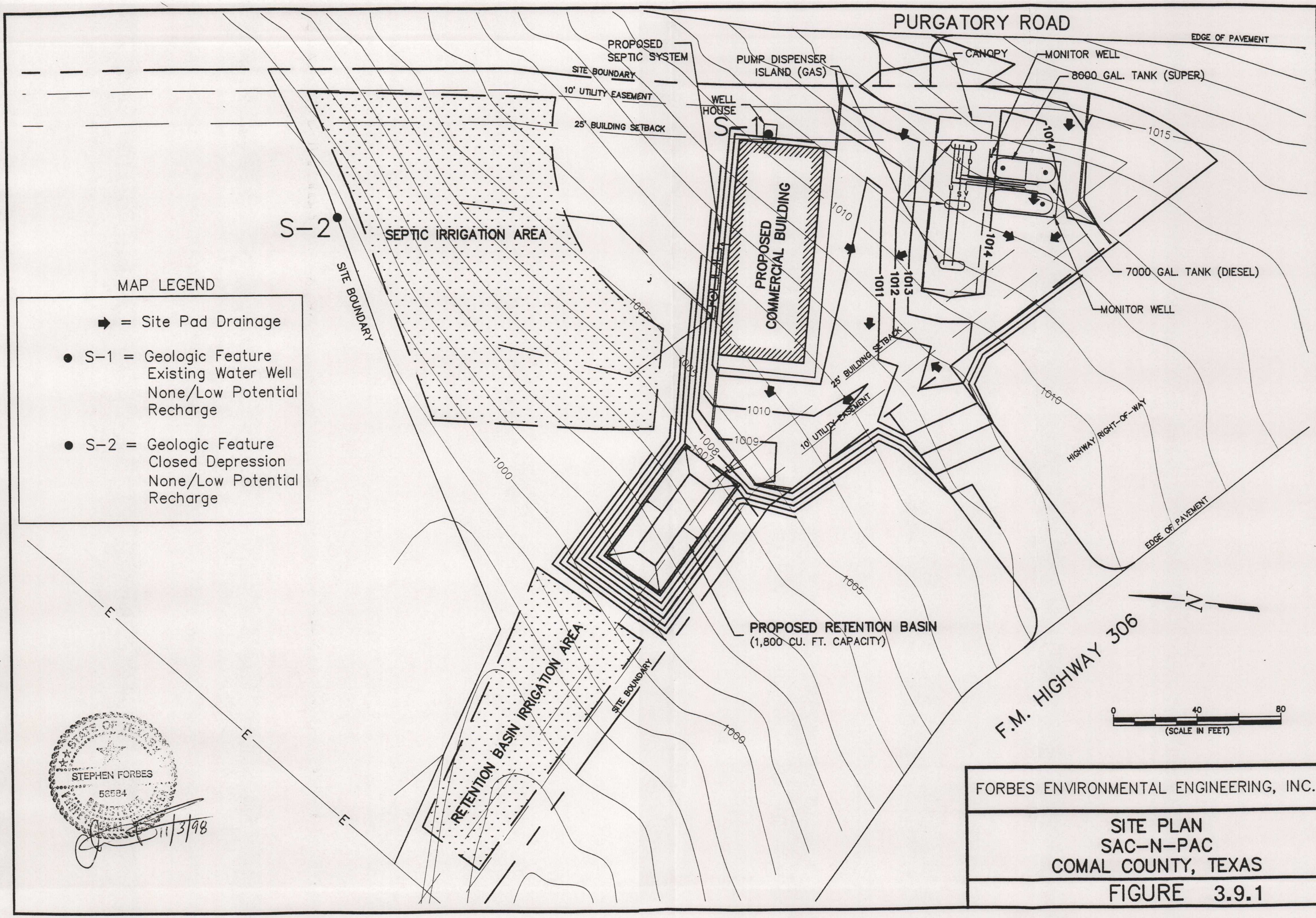
15. **100-year floodplain boundaries**

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

X **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):

FIRM, COMAL COUNTY, TEXAS & UNINCORPORATED AREAS
PANEL NO. 485463 0090 C, SEPTEMBER 29, 1986.


PURGATORY ROAD
EDGE OF PAVEMENT
PROPOSED SEPTIC SYSTEM
PUMP DISPENSER ISLAND (GAS)
CANOPY
MONITOR WELL
8000 GAL. TANK (SUPER)
SITE BOUNDARY
10' UTILITY EASEMENT
25' BUILDING SETBACK
WELL HOUSE
S-1
S-2
SEPTIC IRRIGATION AREA
PROPOSED COMMERCIAL BUILDING
1015
1014
1013
1012
1011
1010
1009
1008
1007
1005
1000
7000 GAL. TANK (DIESEL)
MONITOR WELL
MAP LEGEND
= Site Pad Drainage
S-1 = Geologic Feature Existing Water Well None/Low Potential Recharge
S-2 = Geologic Feature Closed Depression None/Low Potential Recharge
SITE BOUNDARY
25' BUILDING SETBACK
10' UTILITY EASEMENT
HIGHWAY RIGHT-OF-WAY
EDGE OF PAVEMENT
PROPOSED RETENTION BASIN
(1,800 CU. FT. CAPACITY)
N
F.M. HIGHWAY 306
0 40 80
(SCALE IN FEET)
RETENTION BASIN IRRIGATION AREA
E
STATE OF TEXAS
STEPHEN FORBES
58584
11/3/98

FORBES ENVIRONMENTAL ENGINEERING, INC.

SITE PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.9.1

RESPONSE TO SECTION 3.0 ITEM 11

Chemical storage will be limited to typical household and commercial cleaning agents, and normal consumer products stocked on display shelving for purchase.

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

__X__ There are __1__ (#) well 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.

__X__ The wells are in use and comply with 30 TAC §238.

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

ADMINISTRATIVE INFORMATION

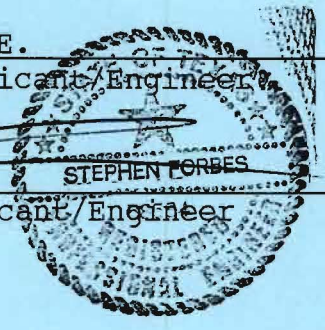
17. __X__ One (1) original and three (3) copies of the following forms, in the **order listed below,** have been provided.

* **GENERAL INFORMATION FORM**
* **GEOLOGIC ASSESSMENT**
* **UST APPLICATION**
* **THIS FORM**
* **TEMPORARY STORMWATER SECTION**
* **PERMANENT STORMWATER SECTION**
* **All THE ADDITIONAL REQUIREMENTS LISTED ON THE APPLICATION GUIDELINES**
* **AGENT AUTHORIZATION FORM, if submitted by agent**
* **FEE FORM**

18. **Any modification of this WPAP will require TNRCC approval, prior to construction, and may require submission of a revised application, with appropriate fees.**

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** is hereby submitted for TNRCC review. The application was prepared by:

STEPHEN FORBES, P.E.
Print Name of Applicant/Engineer



Signature of Applicant/Engineer

11/3/98
Date

TEMPORARY STORMWATER SECTION

FOR

REGULATED ACTIVITIES

ON THE EDWARDS AQUIFER RECHARGE ZONE

AND RELATING TO 30 TAC §213.5(b)(4), EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: SAC-N-PAC STORE #604

PROJECT DESCRIPTION

1. Geologic or manmade features identified on the project site in the geologic assessment are shown below:

#[1]	Feature Type	Relative Infiltration Rate (refer to Geologic Assessment)	Sensitivity of Feature	Temporary Pollution Abatement Measures (Design attached at the end of this form)
S-1	MM	0	POSSIBLE	PUMP HOUSE
S-2	CD	0	NONE	NONE REQUIRED

1 If there are no features present, enter NONE in this column.

POTENTIAL SOURCES OF CONTAMINATION

2. If asphalt is to be used for paving, roofing, etc. describe measures that will be taken during construction to prevent seal coat, emulsion, or other asphaltic products from washing off the project site.

____ No asphalt products will be used on this project.

__X__ Asphalt products will be used on this project. After placement of asphalt, emulsion or coatings, the applicant will be responsible for immediate clean-up should an unexpected rain occur. For the duration of the asphalt product curing time, the applicant should maintain standby personnel and equipment to contain any asphalt wash-off should an unexpected rain occur.

____ Other Measures. A narrative description is provided directly behind this page.

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

____ Aboveground storage tanks with a cumulative storage capacity of less that 250 gallons will be stored on the site for less than one (1) year. A lined earthen berm providing 150% containment is recommended for the temporary aboveground fuel storage tank.

____ 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. A lined earthen berm providing 150% containment will be provided for temporary aboveground fuel storage.

____ Aboveground storage tanks with a cumulative storage capacity

of 500 gallons or more will be stored on the site. An **Aboveground Hydrocarbon and Hazardous Substance Application** must be submitted to the appropriate Regional Office of the TNRCC prior to moving the tanks onto the project.

__X__ Fuels and hazardous substances will be provided by an off-site facilities.

4. __X__ A description of the measures that will be taken to contain any spill of hydrocarbons or hazardous substances is provided directly behind this page.

5. __X__ No temporary aboveground hydrocarbon and hazardous substance storage tank system is installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

6. __X__ Construction equipment/vehicles will be limited, where possible, to traveling within the limits of the project site. Any soil, mud, etc. carried from the project onto public roads will be cleaned up within 24 hours.

7. __X__ All soil, sand, gravel and excavated materials stockpiled on-site will have appropriately sized erosion and sedimentation controls placed downgradient.

8. __X__ Intentional release of vehicle or equipment fluids onto the ground is prohibited. Contaminated soil resulting from accidental spills will be removed and disposed of properly.

9. __X__ All waste construction material and debris will be disposed of properly at an authorized facility.

10. ____ Other potential sources of contamination. A narrative description is provided directly behind this page.

__X__ The are no other potential sources of contamination.

RESPONSE TO SECTION 4.0 ITEM 4

Precaution will be taken to avoid spillage and response plans, supplies and equipment for cleanup of accidental spills will be maintained on site by the contractor.

SITE PLAN

Items 11 through 15 must be included on the Site Plan.

11. __X__ Layout of development (Location of lots, buildings, roads, etc.) is shown and labeled.

12. Temporary pollution abatement measures for Sensitive Features:

__X__ Geologic or manmade features and temporary pollution abatement measures are shown and labeled.
____ There are no geologic or manmade features associated with this project.
____ No geologic assessment is required.

13. __X__ Stabilized Construction Exits are shown and labeled.

14. Appropriate temporary erosion and sedimentation controls are shown and labeled:

__X__ Silt fences (for drainage areas <2 acres)
____ Rock berms (for drainage areas <5 acres)
____ Sedimentation basins (drainage <100 acres)

____ Other measures. A narrative description is provided directly behind this page.

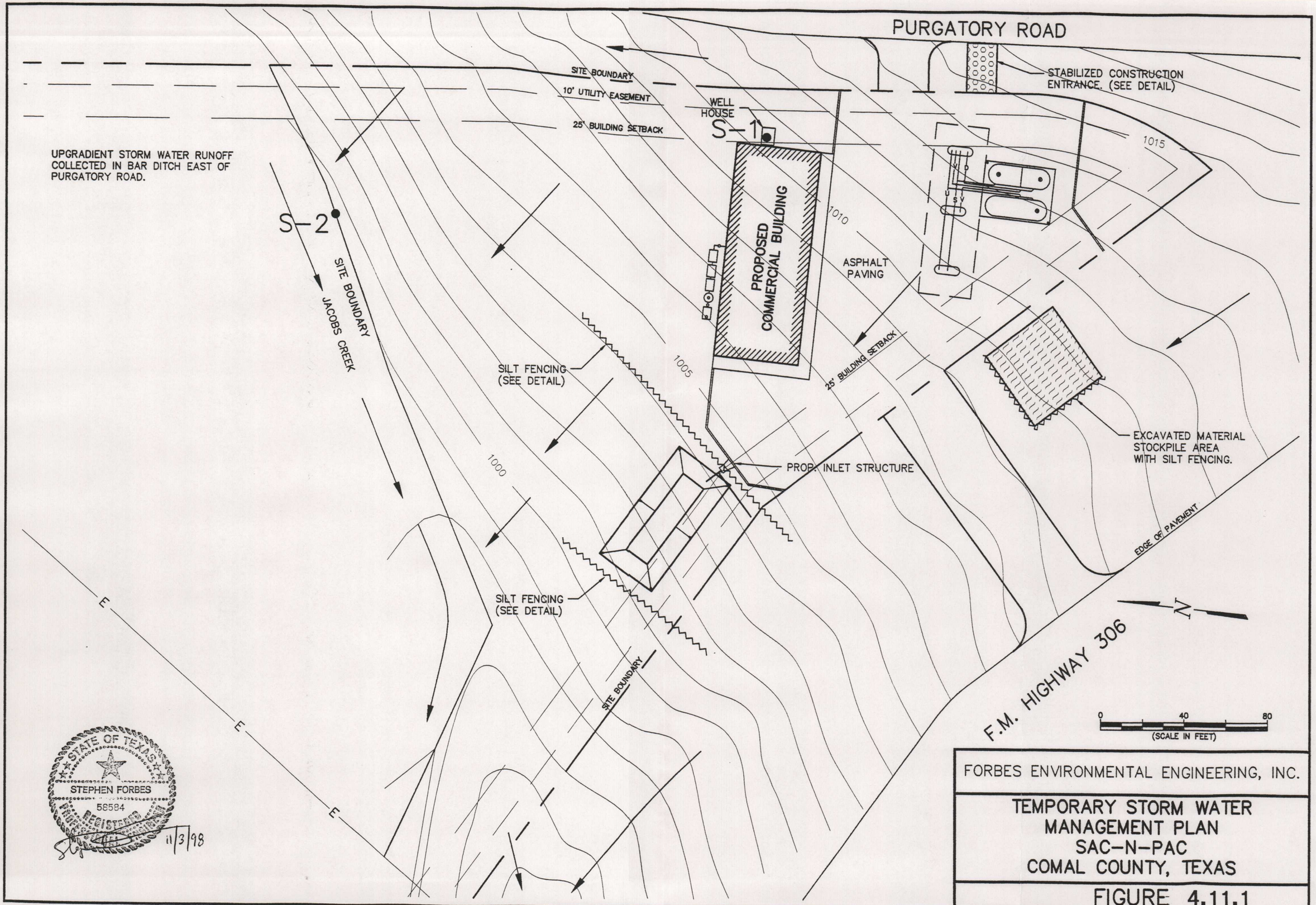
15. Measures to be taken to prevent pollution of stormwaters **originating on-site or upgradient** of the site.

__X__ Stormwater will be directed around the project site with diversion berms/channels/swales labeled on the TEMPORARY WPAP Site Plan. Approval has been obtained from the appropriate regulating authority.
____ Stormwater flow from upgradient will **flow across** the project site. A narrative description is provided directly behind this page.
____ Other measures are shown and labeled on the TEMPORARY WPAP Site Plan. A narrative description is provided directly behind this page.

ADMINISTRATIVE INFORMATION

16. __X__ All structural controls will be maintained according to the submitted and approved operation and maintenance plan for the project.

17. __X__ 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 TNRCC Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TNRCC has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

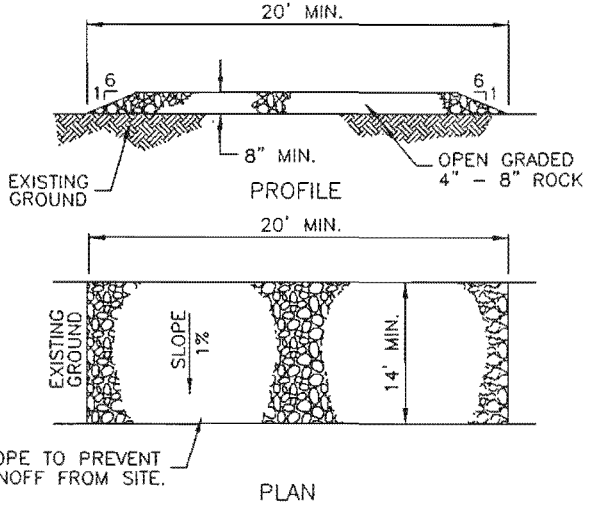


STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED PROFESSIONAL ENGINEER
11/3/98

FORBES ENVIRONMENTAL ENGINEERING, INC.

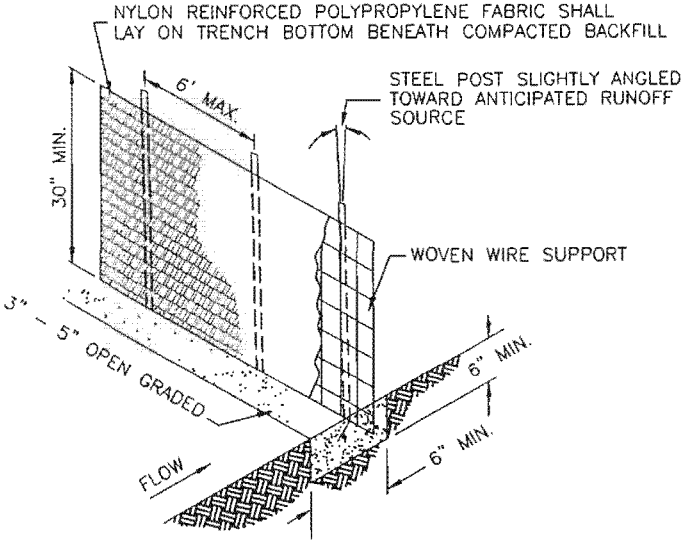
TEMPORARY STORM WATER MANAGEMENT PLAN SAC-N-PAC COMAL COUNTY, TEXAS

FIGURE 4.11.1



STABILIZED CONSTR. ENTRANCE

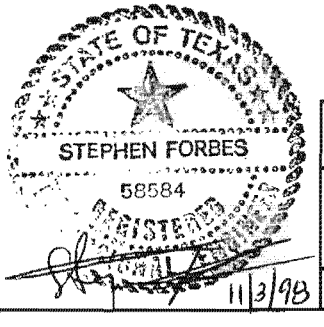
N.T.S.



TENSILE STRENGTH	90 LBS.
PUNCTURE RATING	60 LBS
MULLEN BURST RATING	280 PSI
APPARENT OPENING SIZE, U.S. SIEVE NO.	20

SILT FENCE

N.T.S.



FORBES ENVIRONMENTAL ENGINEERING

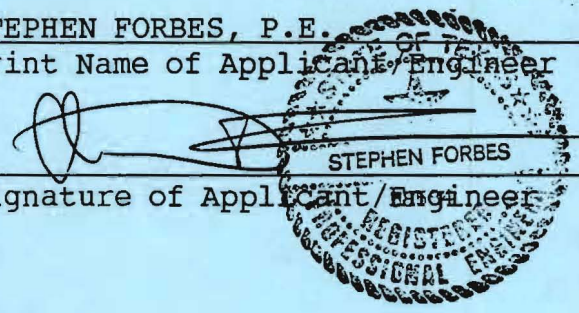
MISCELLANEOUS DETAILS
SAC–N–PAC
COMAL COUNTY, TEXAS

FIGURE 4.11.2

18. __X__ Contractor will construct and maintain silt fences, diversion berms, and other temporary erosion and sediment controls as appropriate to prevent pollutants from entering sensitive features discovered during construction.

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 TNRCC review. The application was prepared by:

STEPHEN FORBES, P.E.
Print Name of Applicant/Engineer



Signature of Applicant/Engineer

11/3/98
Date

PERMANENT STORMWATER SECTION
FOR
REGULATED ACTIVITIES
ON THE EDWARDS AQUIFER RECHARGE ZONE
AND RELATING TO 30 TAC §213.5(b)(4), EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: SAC-N-PAC STORE #604

PROJECT DESCRIPTION

1. Geologic or manmade features identified on the project site in the geologic assessment are shown below:

#[1]	Feature Type	Relative Infiltration Rate (refer to Geologic Assessment)	Sensitivity of Feature	Permanent Pollution Abatement Measure[2] (Design attached at the end of this form)
S-1	**MM**	**0**	**POSSIBLE**	**PUMP HOUSE**
S-2	**CD**	**0**	**NOT**	**NONE REQUIRED**

1 If there are no features present, enter NONE in this column.
2 If the sensitivity value for a feature is indicated as "NOT", no permanent measures are required.

2. The sealing of naturally occurring sensitive features as a pollution control measure will be avoided where reasonable and practicable alternatives exist and will be evaluated by the executive director on a case-by-case basis.

_____No naturally occurring geologic features were found on the project.

POTENTIAL SOURCES OF CONTAMINATION

3. List any potential sources of contamination associated with this project after construction is complete:

1. RUNOFF DRAINAGE
2. GASOLINE AND LUBRICANTS LEAKS FROM PARKED VEHICLES
3. SPILLS FROM UNLOADING OF FUELS/FILLING OF TANKS
4. ASPHALT PARKING AREAS

FOR MULTI-FAMILY, COMMERCIAL, INDUSTRIAL DEVELOPMENTS ANSWER ITEMS 4 THROUGH 6; OTHERWISE GO TO ITEM 7.

4. Measures to be taken to prevent pollution of stormwaters **originating on-site or upgradient** of the site.

__X__ Stormwater will be directed around the project site with diversion berms/channels/swales labeled on the Permanent WPAP Site Plan. Approval has been obtained.
{Note: Existing offsite bar ditches.}

____ Stormwater flow from upgradient will flow across the project site and will be included in sizing calculations for any pollution abatement measures. A narrative description is provided directly behind this page.

__X__ Other measures are shown and labeled on the Permanent WPAP Site Plan. A narrative description is provided directly behind this page.

5. For multi-family residential, commercial, or industrial projects permanent stormwater pollution controls will be:

_____Sedimentation/Filtration basins designed to capture the first 3/4 inch of stormwater runoff. The criteria used for design of the permanent stormwater controls is from:

____ City of Austin Environmental Criteria Manual
- ____ Full sedimentation/filtration basin system
- ____ Partial sedimentation/filtration basin system

_____Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual
- ____ Full sedimentation/filtration basin system
- ____ Partial sedimentation/filtration basin system
- ____ Other. A detailed explanation of the design criteria is provided directly behind this page.

_____Vegetated filter strips (Buffer Zone) designed to treat stormwater runoff. The criteria used for design of the vegetated filter strips is from:

_____City of Austin Environmental Criteria Manual

_____Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual

____ Other. A detailed explanation of the design criteria is provided directly behind this page.

__X__ **Alternative method.** A detailed explanation of the design criteria, including calculations showing pollutant removal rates, is provided directly behind this page. All submittals shall be signed and sealed by a registered professional engineer.

____ This is a single-family residential subdivision.

6. __X__ Scaled plans, profiles, and details are included which illustrate that the proposed treatment system is sized appropriately. Supporting calculations are shown on the plan sheet, including:
- __X__ Volume of stormwater to be treated
- __X__ Sizing of permanent pollution abatement measures.

SECTION 5.0 ITEMS 4 & 5

DESIGN CRITERIA and CALCULATIONS for RETENTION BASIN

Edward Aquifer Recharge Zone	Project Name:	SAC-N-PAC STORE #604
Water Pollution Abatement Plan	Location:	Comal County, Texas
Permanent Storm Water Section	Designed by:	Stephen Forbes, P.E.
	Date:	November 3, 1998

For: Retention Basin with Irrigation

Reference Method: Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual (Effective Date February 1, 1990, amended August 12,1992) {Referred to as LCRA Technical Manual}

{Note: Section 4.2.8(in regard to Retention Basin) from LCRA Technical Manual attached.}

Project: Construction of new facilities including convenience store and installation of new UST System, and support systems including, retention basin, dedicated irrigation area, and septic system.

Step 1 - % Impervious Cover of the Project Site

Project Site: Use 1.7 acres (See Project Detailed Site Map Section 3.0 Figure 3.2) .

Total Impervious Cover:	Structures/rooftops:	5,968 square feet	0.14 acres
	Paved surfaces:	18,421 square feet	0.42 acres
	Total	24,389 square feet	0.56 acres

$$\frac{\text{Total Impervious Cover(acres)}}{\text{Total Project Site Acreage}} \times 100 = \% \text{ Total impervious cover for project site}$$

$$\% \text{ Total impervious cover: } \frac{0.56 \text{ acres}}{1.75 \text{ acres}} \times 100 = 32\%$$

Step 2 - Identify Target Reduction Level
(Source: LCRA Technical Manual)

Given Performance Standards Based on Slope of Site				
Location of Site	Slope of Property	Required Reduction Level of Indicator Pollutant		
		TSS	TP	O&G
More than 500 feet from notable recharge features	under 10%	70%	70%	70%
	10% -20%	80%	75%	75%
	over 20%	90%	85%	85%
Less than 500 feet from notable recharge features	under 10%	75%	75%	75%
	10% - 20%	90%	85%	85%
	over 20%	90%	85%	85%

Since slopes across the project site are under 10% and significant recharge features are located within 500 feet of the project site, a target reduction level of 75% for all three indicator pollutants is selected.

Step 3 - Select a Capture Volume
(Source:LCRA Technical Manual)

Removal Efficiencies Percent of Indicator Pollutants										
Capture Volume (inches)	% Impervious Cover of Project Site									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0.50	78	75	70	66	61	57	54	51	48	46
0.75	79	78	75	72	69	66	63	61	58	56
1.00	80	79	78	76	74	71	69	67	65	62
1.50	80	79	79	78	77	76	75	73	72	70
2.00	80	80	79	79	79	78	77	76	75	74

Using the 30% of impervious cover from Step 1 and the 75% reduction levels from Step 2 the capture volume to use for the retention basin design is 0.75 inch.

Step 4 - Size of Retention Basin

a) Capture volume =0.75 inch = 0.0625 feet — See Step 4
b) Capture area = 24,389 square feet — See Step 1

24,389 square feet x 0.0625 feet = 1,524 cubic feet of storage capacity
use 1,800 cubic feet
1,800 cubic feet x 7.48 gal/cu.ft = 13,464 gallons

{Note: total safety factor = 15% not counting safety factor introduced by tables}

Step 5 - Irrigation Area Requirements

LCRA Technical Manual irrigation operating parameters:

Application rate	Maximum 0.1 inches per hour
Irrigation cycle	Maximum 12 hours per day
Collected volume to be removed	within 72 hours after rainfall event

a) Daily application rate:

12 hours/day x 0.1 inch/hour = 1.2 inches/day

b) Total application depth within 72 hours:

1.2 inches/day x 3.0 days = 3.6 inches of application allowed over irrigation area
= 0.3 feet

Total Application Time = 12 hours per day x 3 days= 36 hours

c) Total application area:

$$\text{Area} = \frac{\text{Retention Basin Storage Capacity}(ft^3)}{\text{Total Application Depth}(ft)}$$

$$\text{Required Irrigation Area} = \frac{1{,}800\ ft^3}{0.3\ ft} = 6{,}000\ ft^2$$

Step 6 Discharge Rate

Retention Basin Storage Capacity: 13,464 gallons — See Step 4
Total Application Time: 36 hours — See Step 5b

$$\text{Discharge Rate} = \frac{13{,}464 \text{ gallons}}{36 \text{ hours}} = 374 \text{ gph or } 6.2 \text{ gpm}$$

Step 7 Final Design

Final Retention basin design criteria(see attached detail):

- Capture volume — 0.75 inch
- Capacity — 1,800 cu. ft. = 13,464 gals.
- Water Surface Elevation — 1,006 feet msl
- Bottom elevation — 1,004 feet msl
  - ◊ Freeboard — 1,007 feet msl(1 foot)
  - ◊ Side Slopes — 3:1
- Bypass — greater than 13,464 gallons
  - ◊ Line pipe soffit elevation — 1,006 feet msl (invert at 1,005.33 ft msl)
  - ◊ Branch pipe invert elevation — 1,006 feet msl
- Drain pipe to basin — 8"
  - ◊ max. hrly intensity 100 yr storm — i = 4" per hour
  - ◊ drainage area — A= 6,000 square foot
  - ◊ surface coefficient — C= .95
  - ◊ Drainage area discharge Q=CiA

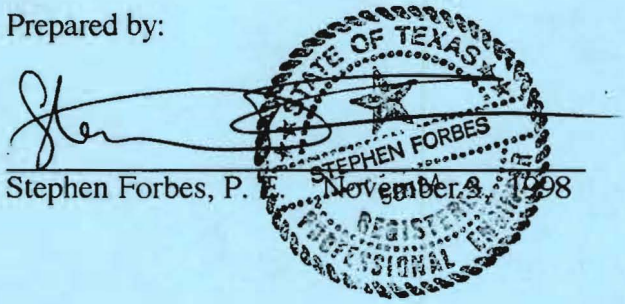
Q= .95(.33 fph)(6,000 sq.ft)= 1,900 cf/hr = 0.53 cfs or 237 gpm

(6" or 8" sufficient; use 8" pipe Sch. 40 PVC for worse case scenario)

Irrigation System:

- Basin to be emptied within 72 hours after rainfall event
- Application rate 0.1 inch per hour
- Irrigation area requirements: 6,000 square feet
- Maximum discharge rate : 6.2 gpm at 40 ft head
- 1 gpm per sprinkler head; 6 sprinkler heads @ 1 gal. ea.
- 1/2 hp submersible pump, 115v

Prepared by:



Stephen Forbes, P. E. November 3, 1998

OPERATION AND MAINTENANCE PROCEDURES

7. _X_ The maintenance plan and schedule for each permanent pollution abatement structure or measure is provided directly behind this page.

STREAM CONTAMINATION AND/OR EROSION

8. If construction of the project will increase flashing, create stronger flow and stream velocity, or otherwise increase instream erosion and the degradation of water quality, measures to avoid or minimize the surface stream contamination or changes in the way that stormwater enters the stream must be taken.

_X_ The project will not increase the peak of the downgradient instream stormwater hydrograph or the downgradient velocity of the stream.

____ The project will increase the peak of the downgradient instream stormwater hydrograph and/or the downgradient velocity of the stream. A description of the measures to avoid or minimize the effects of the regulated activity on the downgradient stream is provided directly behind this page.

SITE PLAN
Items 9 through 15 must be included on the Site Plan.

9. _X_ Layout of development (Location of lots, buildings, roads, etc.) is shown and labeled.

10. _X_ Geologic or manmade features are shown and labeled.
____ There are no geologic or manmade features associated with this project.

11. ____ Vegetated filter areas are shown and labeled.
_X_ There are no vegetated filter areas associated with this project.

12. ____ Sedimentation/filtration basins are shown and labeled.
_X_ There are no sedimentation/filtration basins associated with this project.

13. ____ Berms, channels, etc. showing velocity controls are shown and labeled.
_X_ There are no berms, channels, etc. associated with this project. **{There are existing offsite bar ditches.}**

14. _X_ Areas of concentrated runoff with appropriately sized energy dissipators at each outfall are shown and labeled.
____ There are no areas of concentrated runoff (channels, culverts, drainage pipe discharges, etc.) associated with this project.

RESPONSE TO SECTION 5.0, ITEM 7

OPERATION & MAINTENANCE PLAN

RETENTION BASIN:

Monthly: The vegetated growth in the retention basin will be checked monthly, and if necessary, mowed or otherwise controlled to prevent growth from exceeding 12" in height.

Pump will be checked at least monthly for proper operation.

Quarterly: Silt depth will be checked every three months. If depth of silt exceeds 6", it will be removed and redeposited of onsite over the vegetated area.

The basin will be checked for the accumulation of trash or debris and removed.

After Rainfall: The basin should be checked after each storm event exceeding 1" for excessive accumulation of silt. Silt accumulations above 6" shall be removed from the basin.

Sediment which accumulates in front of the energy dissipater (saw tooth curb) at the inlet structure to the retention basin will be removed following each significant storm event. This material will be redeposited across the vegetated areas.

VEGETATED IRRIGATION AREA

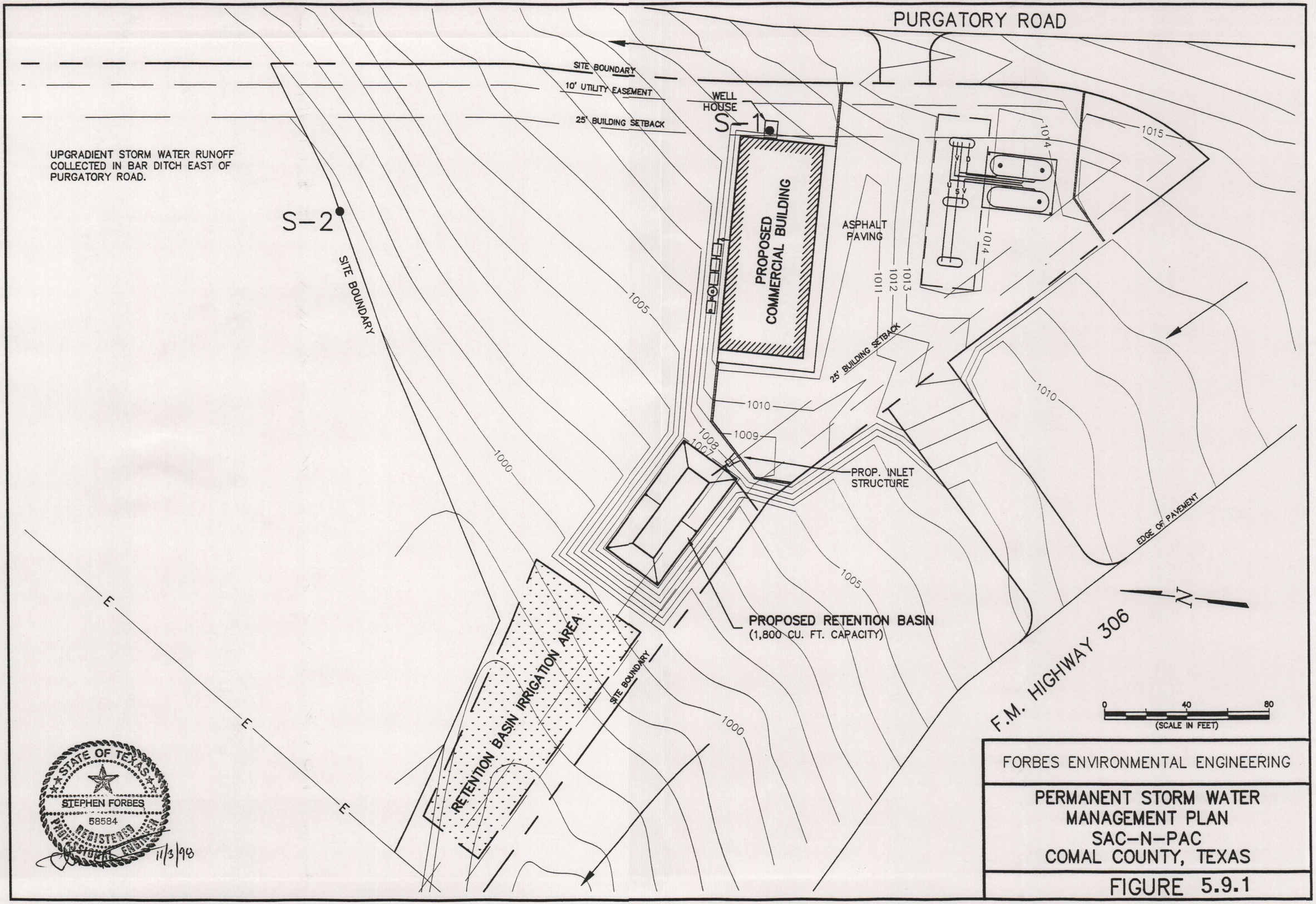
1. The vegetated irrigation area will be maintained with uniform slopes to encourage sheet flow, even distribution and percolation of irrigated area. Areas of channeled flows will be filled, leveled, and a vegetative cover established.

2. A healthy vegetative cover will be maintained. The vegetation will be mowed as needed to keep grass height below 6" and to prevent the establishment of woody perennial species.

IRRIGATION SYSTEM

1. The operator will ensure that the system, including switches, valves, sprinkler heads, pump, and other components are regularly inspected (no less than once per month) to unsure proper working condition.

2. During operation of the irrigation system, the operator will ensure that the system is applying appropriate volumes of stormwater at no greater than 0.1 inch per hour. The design irrigation schedule is to empty the pond within 72 hours after a rainfall event irrigating for 12 hours per day at a rate of no greater than 6 gpm. If the system is not operating within these parameters, adjustments to or modification of the system shall be performed.

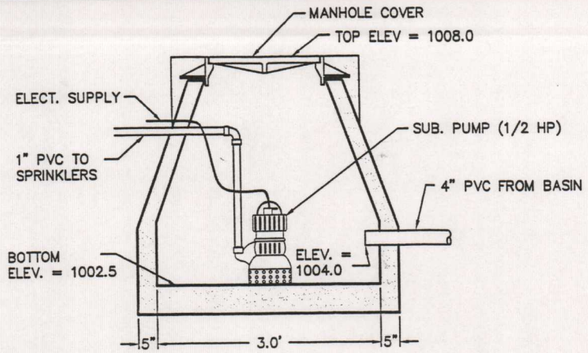


STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED
PROFESSIONAL ENGINEER
11/3/98

FORBES ENVIRONMENTAL ENGINEERING

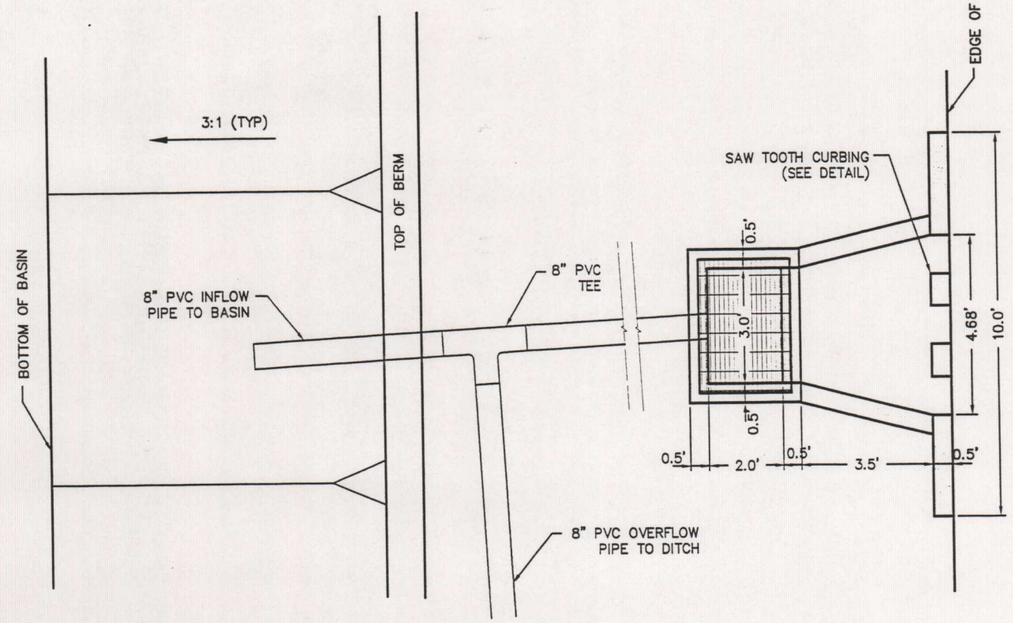
PERMANENT STORM WATER MANAGEMENT PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 5.9.1



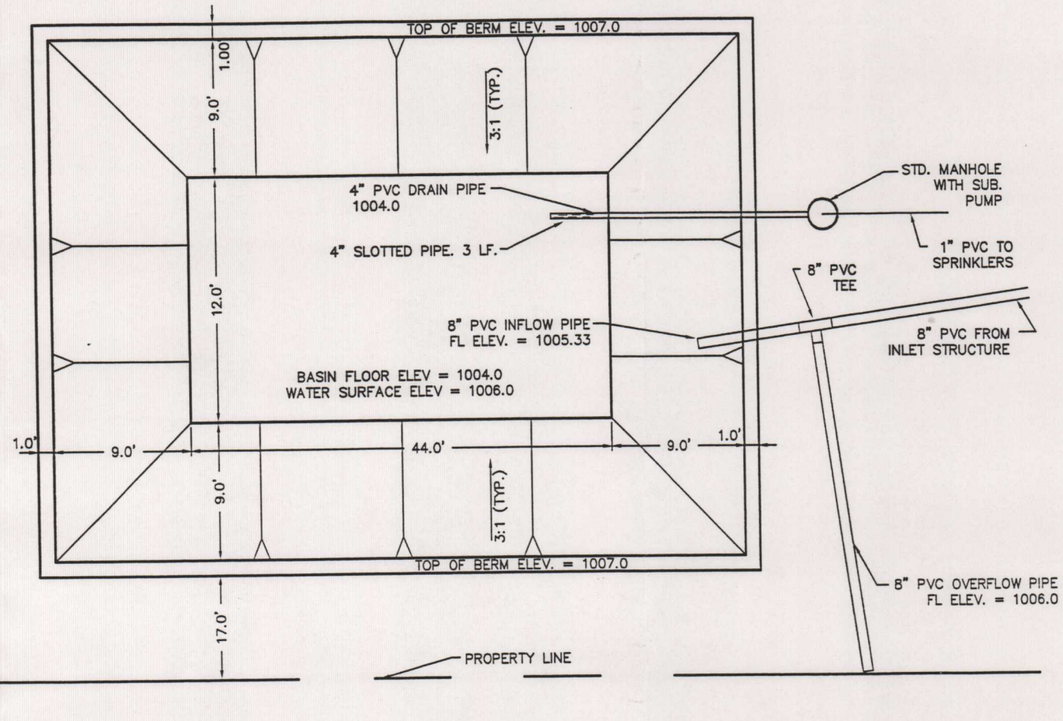
STD. MANHOLE WITH SUB. PUMP

NOT TO SCALE



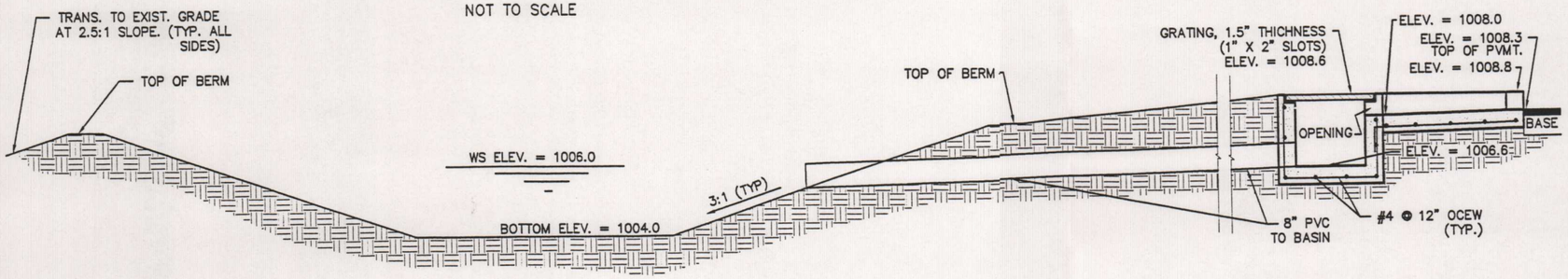
PLAN VIEW
INLET STRUCTURE TO BASIN

NOT TO SCALE



RETENTION BASIN PLAN

1" = 10'



SECTION
INLET STRUCTURE TO BASIN

NOT TO SCALE

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED PROFESSIONAL ENGINEER
11/3/98

FORBES ENVIRONMENTAL ENGINEERING

RETENTION BASIN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 5.9.2

15. __X__ Other pollution abatement measures are shown and labeled. A narrative description is provided directly behind this page. (SEE ITEM 4 & 5)

ADMINISTRATIVE INFORMATION

16. __X__ All structural controls will be maintained according to the submitted and approved operation and maintenance plan for the project.

17. __X__ 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 TNRCC Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TNRCC has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

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 TNRCC review. The application was prepared by:

STEPHEN FORBES, P.E.
Print Name of Applicant/Engineer

STEPHEN FORBES 68584 REGISTERED

Signature of Applicant/Engineer

11/3/98
Date

AGENT AUTHORIZATION FORM
FOR SUBMITTAL OF
EDWARDS AQUIFER PROTECTION PLANS
FOR REGULATED ACTIVITIES ON THE
EDWARDS AQUIFER RECHARGE/TRANSITION ZONES
AND RELATING TO 30 TAC §213.4(d), EFFECTIVE DECEMBER 27, 1996

I Janelle Warren
Print Name

Owner
Title - Owner/President/Other

of SAC-N-PAC STORES, INC.
Corporation/Partnership/Entity Name

have authorized STEPHEN FORBES, P.E.
Print Name of Agent/Engineer

of FORBES ENVIRONMENTAL ENGINEERING, INC.
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 Edwards Aquifer Protection Plan application to the Texas Natural Resource Conservation Commission (TNRCC) for the review and approval consideration for construction of regulated activities on the Edwards Aquifer Recharge Zone or Transition Zone (30 TAC §213.4(d)).

I also understand that:

1. No regulated activity is allowed to commence prior to the executive director's approval of the Edwards Aquifer protection plan. If unauthorized construction begins before the approval is granted or if any aspect of the project does not conform to 30 Texas Administrative Code §213 and any condition of the TNRCC's approval letter, the TNRCC is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. Before beginning any construction related to the approved regulated activity, the appropriate TNRCC regional office must be given 24 to 48 hour written notice of the date when the regulated activity will commence.

3. **A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and the forms must accompany the completed submittal.**

4. Application fees accompanied by an Edwards Aquifer Application Fee Form are due and payable at the time the application is submitted. The application fee must be sent to the Revenues Section of the TNRCC or to the appropriate regional office. **The application will not be considered until the correct fee is received by the commission.**

Janelle Warren
Applicant's Signature

11-4-98
Date

THE STATE OF TEXAS §

County of Hays §

BEFORE ME, the undersigned authority, on this day personally appeared Janelle Warren 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 4th day of November, 1998.

Lori E. Klaver

LORI E. KLAVER NOTARY PUBLIC STATE OF TEXAS EXPIRES 2002

Signatories to Applications 30 TAC §213.4(d)

(1) Required Signature. All applications must be signed as follows.

(A) For a corporation, a principal executive officer (president, vice-president, or a duly authorized representative) must sign the application. A representative must submit written proof of the authorization.

(B) For a partnership, a general partner must sign the application;

(C) For a political entity such as a municipality, state, federal or other public agency, either a principal executive officer or a duly authorized representative must sign the application. A representative must submit written proof of the authorization.

(D) For an individual or sole proprietorship, the individual or sole proprietor must sign the application.

(2) Proof of Authorization to Sign. The executive director requires written proof of authorization for any person signing an application.

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

EDWARDS AQUIFER PROTECTION PROGRAM

APPLICATION FEE FORM

NAME OF PROPOSED PROJECT: SAC-N-PAC STATE HIGHEAY 306 & PURGATORY ROAD

PROJECT LOCATION: INTERSECTION OF STATE HIGHWAY 306 & PURGATORY ROAD, NEW BRAUNFELS, TEXAS.

NAME OF OWNER/DEVELOPER: MR. WARNER GARLAND

OWNER'S ADDRESS: 1405 UNITED DRIVE, SUTIE 115, SAN MARCUS, TEXAS 78666

CONTACT PERSON: MR. TOM SCHOTT (Please Print) PHONE: (512)392-6494

AUSTIN REGIONAL OFFICE

- ☐ Hays
- ☐ Travis
- ☐ Williamson

SAN ANTONIO REGIONAL OFFICE

- ☐ Bexar
- ☒ Comal
- ☐ Kinney
- ☐ Medina
- ☐ Uvalde

APPLICATION FEES MUST BE PAID BY CHECK, CERTIFIED CHECK, OR MONEY ORDER, PAYABLE TO THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION. YOUR CANCELED CHECK WILL SERVE AS YOUR RECEIPT. **TO ENSURE CREDIT TO THE PROPER ACCOUNT PLEASE RETURN THIS FORM WITH YOUR FEE PAYMENT. THIS PAYMENT IS BEING SUBMITTED TO (CHECK ONE):**

☒ **SAN ANTONIO REGIONAL OFFICE**

☐ **Mailed to TNRCC:**
TNRCC - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ **AUSTIN REGIONAL OFFICE**

☐ **Overnight Delivery to TNRCC:**
TNRCC - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
512/239-0347

Type of Application	Size	Fee Due		
		New (3373)	Modification (3374)	
WPAP	1.7 Acres	$ 3,000	$	PAP
SCS	L.F.	$	$	SCS
Lift Stations without sewer lines	Acres	$	$	
UST/AST	2 Tanks	$ 1,000	$	HHS
Piping System(s) (Installed without tanks)	Each	$	$	PSM
Extension of Time	Each	$	$	EXT

Signature

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED

11/3/98
Date

TNRCC-0574 (2/4/97)

FORBES
ENVIRONMENTAL
ENGINEERING, INC.

November 1998

COPY 2

UNDERGROUND HYDROCARBON AND HAZARDOUS SUBSTANCE APPLICATION FOR STORAGE ON THE EDWARDS AQUIFER RECHARGE ZONE

SAC-N-PAC STORE #604
HIGHWAY 306 & PURGATORY ROAD
COMAL COUNTY, TEXAS

FORBES
ENVIRONMENTAL
ENGINEERING

435 Isom Rd., Suite 228
San Antonio, Texas 78216
(210)342-8382; Fax: 344-5407

NOTICE

To: Texas Natural Resource Conservation Commission **Date:** November 5, 1998
Region 13 San Antonio
140 Heimer Road, Suite 360
San Antonio, Texas 78233-5042
(210) 490-3096

From: Stephen Forbes, P.E.

Re: Underground Hydrocarbon Application for Storage on the Edwards Aquifer Recharge Zone

The attached application is submitted on behalf of Sac-N-Pac Stores, Inc.(SNP) of San Marcos, Texas for the construction of a two underground hydrocarbon storage tanks (UST) and storage for the fuel products. The UST system is to be installed on a 1.75 acre SNP property located at the intersection of State Highway 306 and Purgatory Road, in Comal County, Texas. (See Site Aerial Map attached)

The application fee of $4,000 (SNP Check No.27449 dated11/3/98 made out to the "TNRCC") is submitted as part of this application to the Texas Natural Resource Conservation Commission (TNRCC). The fee covers two USTs($1,000), and the Water Pollution Abatement Plan Application for projects for greater than 1 acre($3,000)(submitted separately and concurrently with this Application).

One(1) original and three (3) copies of the Application have been provided. Each copy is laid out in the following order:

Section 1	General Information
Section 2	Geologic Assessment
Section 3	UST Application
Section 4	Temporary Stormwater Plan
Section 5	Permanent Stormwater Plan
Section 6	Agent Authorization Form
Section 7	Fee Form

All documents are certified by a registered professional engineer and signed by applicant where appropriate and as required.

Any questions regarding this application should be directed to Stephen Forbes, P.E. at (210)342-8382 or Mr. Tom Schott of Sac N Pac at (512)392-6484.

The following is a detailed summary of the Application.

SECTION 1.0 GENERAL INFORMATION

The planned project is to construct a convenience store with fueling capabilities at the intersection of Purgatory Road and State Highway 306 approximately 10 miles north of New Braunfels, Texas in the County of Comal. The project site is 1.75 acres located on the recharge zone of the Edward Aquifer(EARZ). Therefore, a Water Abatement Pollution Abatement Plan (WPAP) Application is required and submitted concurrently but separately along with this Application.

Section 1.0 of the application includes the following attachments:

- General Information Form
- Detailed Description of Proposed Project(summarized below)
- Road Map
- Site Aerial Map
- USGS Quadrangle showing recharge boundaries and drainage path.

SECTION 2.0 GEOLOGIC ASSESSMENT

The geologic assessment was performed by a qualified geologist. The Site is located on the EARZ. It is not located within the 100 year flood plain. The assessment identified two potential recharge features onsite S-1 and S-2. The relative infiltration rates for both features are zero. S-1 is water well completed in the Glen Rose formation and is enclosed in a pump house. It is considered by the geologist to be a possible sensitive feature with none to low potential for recharge. S-2 is a small closed depression determined not to be a sensitive feature with none to low potential for recharge.

S-1 water well is located upgradient of the UST system, but less than 150 feet from the USTs. The well is an active well, which will be maintained as non-drinking water supply well. Therefore, the system tankhold and pipe chase will be lined with an external tertiary liner(see Item 9.0, Section 1.0)

Section 2.0 of the application includes the following attachments:

- Geologic Assessment Form
- Stratigraphic Column
- Existing Site Plan and Geologic Map
- Geologic Assessment Table
- Feature Comments
- Site Photographs
- List of References

SECTION 3.0 UST APPLICATION FORM

The UST system is designed to meet or exceed the Technical Standards of Subchapter C of 30 TAC 334 for the installation of new petroleum underground storage tanks, and the equipment complies with all appropriate and applicable standards.

The proposed facility includes two USTs with the capacities of 15,000 gallons. One tank will store regular unleaded gasoline, the other is a split tank which will store 8,000 gallons of super unleaded and 7,000 gallons of diesel. The bedding and backfill material will be crushed rock.

The tanks will be constructed of double walled fiberglass reinforced plastic (FRP). The FRP will be the principal corrosion protection method. The production line will be 2" FRP with 3" secondary containment FRP piping. The vent recovery lines will be a single wall 2" FRP pipe. The pump stainless steel braided flexible connectors will be placed in high density polyethylene (HDPE) protective sumps to isolate then from the backfill material.

Metal components (e.g. tank risers, and vent couplings) exposed directly to the backfill will be wrapped with a dielectric tape to isolate the fittings.

Secondary containment will be provided by the outer secondary FRP wall of the storage tanks and 3" secondary piping for the production lines, and the protective HDPE sumps at the pump and dispenser connections.

Spill and overspill protection will be an integral part of the fill system, including a spill containment reservoir, tight-fill adapter and an automatic shut off valve at 95% of tank capacity.

Leak detection probes will be placed between the tank walls, on the production line, and in the pump secondary containment. The production lines will be continuously tested and equipped with an automatic shut off valve. The tank fuel level will be measured with an automatic tank inventory gauge. All the detection sensors will be monitored by a programmable central onsite monitor with a visual and audible alarm. Two 4" PVC screened observation wells will be installed in opposite diagonal corners of the tank hole.

Tertiary Containment will be an external liner placed within the tankhold and pipe chase due to the location of the water well within the 150 radius(i.e. approximately 80 Feet). The liner will be fabricated from impervious 20 mil NPC material reinforced with an underlying geofabric. It will be prefabricated to fit the size of the tankhold without open seams.

The UST application Sections consists of the following documents:

- Signed application form.
- Detailed description of UST System
- Existing Site Plan
- Detailed Final Site Plan
- List of Equipment
- Figures of UST layout and cross-sections.

SECTION 4.0 TEMPORARY STORMWATER SECTION

The temporary stormwater section provides the temporary water pollution abatement measures to be implemented during site construction.

In general, precautions will be taken to minimize impact of construction by appropriately managing surface run off, spills, excavated soils, and construction debris and material.

Stabilized construction rock pad will be placed at the site entrance and exit during construction. Project site and stockpile stormwater run-on and run-off will be filtered through with silt fences. Silt fences will be placed around the onsite geologic features. A temporary silt fence will be placed along the upper embankment of the creek adjacent to the site. A bar ditch along Purgatory Road will prevent up gradient stormwater run-on on to the site.

S-1 water well is enclosed in a pump house which is located upgradient and adjacent to the Site pad. Care will be taken to prevent run-off from entering the enclosure. S-2 is not in the drainage pattern of the construction activities, or final operations.

If any geologic features are discovered during construction, construction in the vicinity of the feature will be suspended and the TNRCC regional office will be notified.

Section 4.0 includes the following attachments:

- Fuel servicing practices
- Spoil material management
- Construction material management practices
- Temporary Stormwater Management Site Plan

SECTION 5.0 PERMANENT STORMWATER SECTION

The criteria used for the design of the proposed permanent Stormwater Manage Plan(SMP) was from the Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual(effective February 1, 1990 and amended August 12, 1992) referred to a LCRA Technical Manual.

The basic SMP is to prevent run-on by diverting flow around the site in the existing bar ditch along Purgatory Rd. The facility runoff will be collected in a Retention Basin designed to collect the first 0.75 inch of storm water based on calculation methods presented in the LCRA Technical Manual and provided in Application(Section 5.0). Excess storm water above the first 0.75 inch is designed to bypass the basin and discharge into the existing natural drainage.

The collected stormwater will be pumped from the basin to a vegetated area specifically set aside for irrigating with a sprinkler system. The stormwater will be dispersed in 12 hour cycles over a 72 hour period, at an application rate of 0.1 inches per hour in accordance with the LCRA Technical Manual.

The water well(S-1) is enclosed in a pump house structure. The feature(S-2) is not within the facility drainage path.

SECTION 6.0 AGENT AUTHORIZATION FORM

This section provides notarized authorization by the owner of Sac-N-Pac Stores, Inc. for Forbes Environmental Engineering, Inc. to prepare and submit the Application on their behalf.

SECTION 7.0 FEE FORM

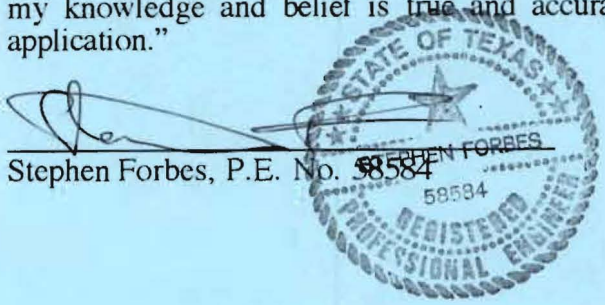
New Facility Application Fees Due:

WPAP	1.75 acres	$3,000.00
UST	2 tanks	$1,000.00
Total Due		$4,000.00

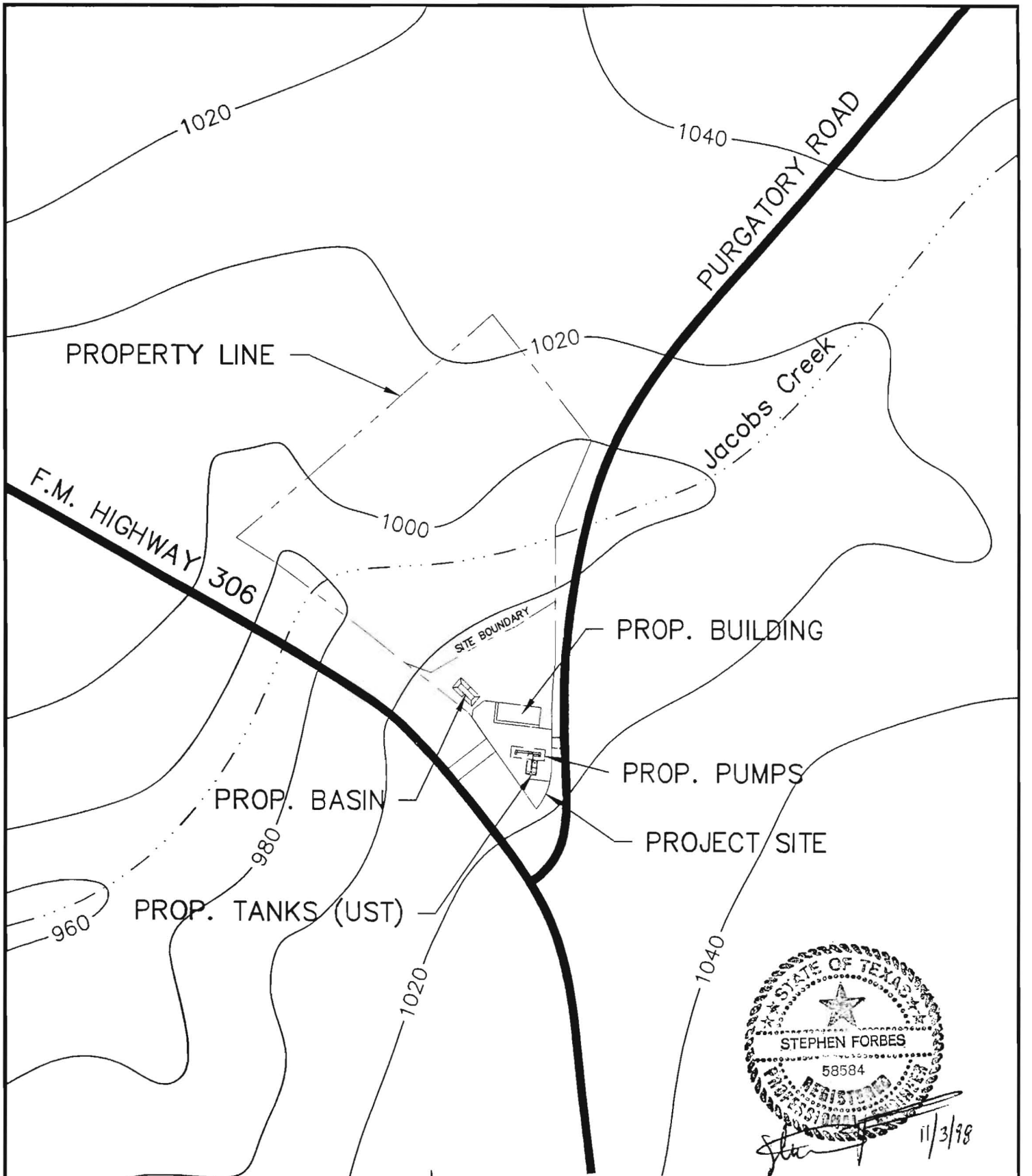
The fees are submitted to San Antonio Regional Office, along with the two respective applications submitted concurrently.

Certification

"I certify that this document and all the attachments were prepared under my direction or supervision. Based on my inquiry of the person or persons who provided the information herein, the information as submitted, to the best of my knowledge and belief is true and accurate within the scope of the application."



Stephen Forbes, P.E. No. 58584



FORBES ENVIRONMENTAL ENGINEERING, INC.

SITE AREAL MAP
SAC–N–PAC
COMAL COUNTY, TEXAS

FIGURE

UNDERGROUND HYDROCARBON
And
HAZARDOUS SUBSTANCE
APPLICATION
FOR
STORAGE
ON THE
EDWARDS AQUIFER
RECHARGE ZONE

for

SAC-N-PAC STORE #604
Highway 306 & Purgatory Road
Comal County, Texas

Prepared for
Texas Natural Resource Conservation Commission
Regional Office 13
San Antonio Texas

On behalf of
Sac and Pac Stores, Inc.
San Marcos, Texas

Prepared By

Stephen Forbes, P.E.
Forbes Environmental Engineering, Inc.
San Antonio, Texas

November 1998

TABLE OF CONTENTS

GENERAL INFORMATION FORM

FOR
REGULATED ACTIVITIES
ON THE EDWARDS AQUIFER RECHARGE ZONE
AND RELATING TO 30 TAC §§213.4 & 213.5, EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: SAC-N-PAC STORE No. 604

COUNTY: COMAL County STREAM BASIN: JACOBS CREEK

TYPE: ____ WPAP ____ AST ____ EXCEPTION
____ SCS __X__ UST ____ MODIFICATION

Do not write in this box. TNRCC use only.	

Received by Region	

Fee Due:	$

Payment Verified:	

Inspection Date:	

Judged Administratively ____ complete ____ incomplete	

Written Comments Received From City/County: UWCD within 30 Days:	__ Yes __ No __ Yes __ No

____ Approved ____ Incomplete and Returned	

APPLICANT INFORMATION

1. Applicant:

Contact Person: MR. TOM SCHOTT
Entity: SAC-N-PAC STORES, INC.
Mailing Address: 1405 UNITED DRIVE, SUITE 115
City, State: SAN MARCOS, TX Zip: 78666
Telephone: (512)392-6494 Fax: (512) 392-6333

2. Agent/Representative (If any):

Contact Person: MR. STEPHEN FORBES, P.E.
Entity: FORBES ENVIRONMENTAL ENGINEERING, INC.
Mailing Address: 435 ISOM ROAD, SUITE 228
City, State: SAN ANTONIO, TX Zip: 78216
Telephone: (210)342-8382 Fax: (210)344-5407

PROJECT LOCATION

3. Site Address: SAC-N-PAC STORE#604
Street: STATE HIGHWAY 306 & PURGATORY ROAD
City: NEW BRAUNFELS, TX Zip: 78132

4. ____ This project is inside the city limits of the City of _____.

__X__ This project is outside the city limits but inside the ETJ (extra-territorial jurisdiction) of the City of NEW BRAUNFELS.

____ This project is not located within any city's limits or ETJ, but is located within _____ County.

5. The location of the project site is described below. Provide sufficient detail and clarity so that the TNRCC's Regional staff can easily locate the project for a field investigation.

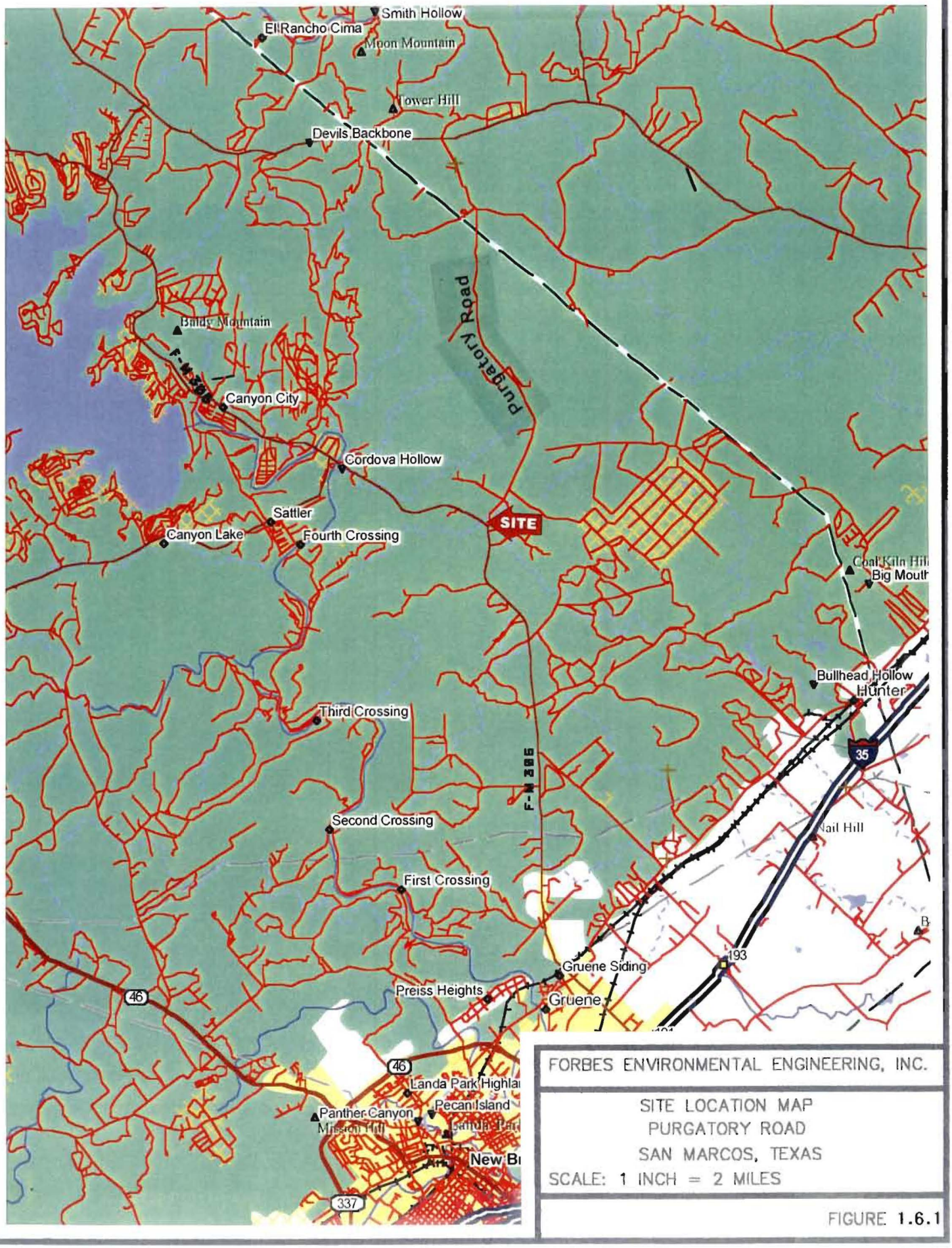
THE PROJECT SITE IS LOCATED AT THE INTERSECTION OF PURGATORY ROAD AND HIGHWAY 306 APPROXIMATELY 10 MILES NORTH OF NEW BRAUNFELS, TEXAS. THE SITE IS THE PROPERTY ON THE NORTHWEST QUADRANT OF THE INTERSECTION.

ROAD AND RECHARGE ZONE MAPS

6. __X__ A **Road Map** is attached behind this sheet showing directions to and location of project site.

7. __X__ A copy of the official 7 1/2 minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached behind this sheet. The map(s) should clearly show:

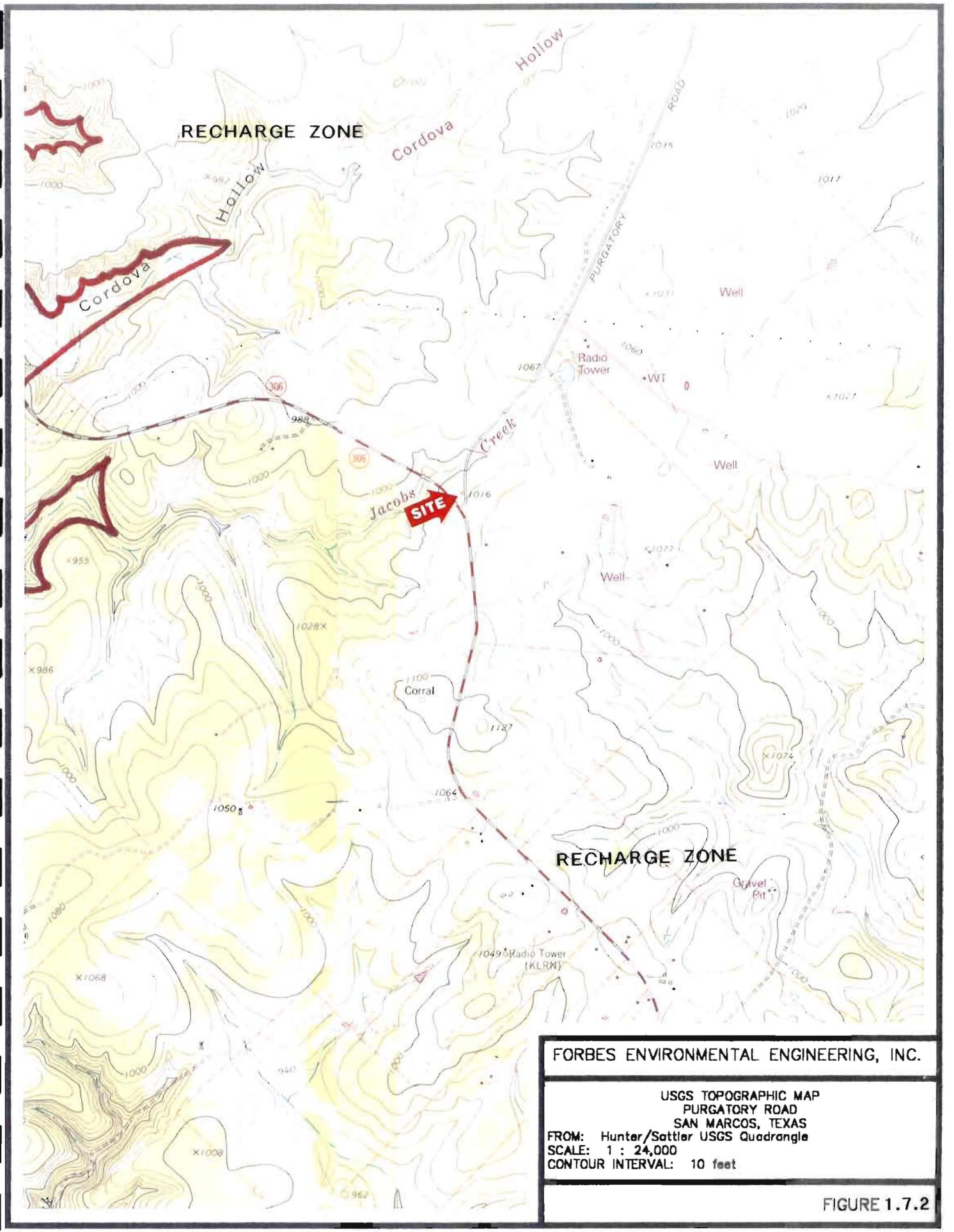
__X__ **Project site.**
__X__ **USGS Quadrangle Name.**
__X__ **Boundaries of the Recharge Zone.**
__X__ **Drainage path from the project to the boundary of the Recharge Zone.**



FORBES ENVIRONMENTAL ENGINEERING, INC.

SITE LOCATION MAP
PURGATORY ROAD
SAN MARCOS, TEXAS
SCALE: 1 INCH = 2 MILES

FIGURE **1.6.1**



FORBES ENVIRONMENTAL ENGINEERING, INC.

USGS TOPOGRAPHIC MAP
PURGATORY ROAD
SAN MARCOS, TEXAS
FROM: Hunter/Sattler USGS Quadrangle
SCALE: 1 : 24,000
CONTOUR INTERVAL: 10 feet

FIGURE 1.7.2

Recharge/Transition Zone Maps are available from:
Accugraphics 512/459-4929
Barton Springs/Edwards Aquifer Con. District 512/282-8441
Edwards Aquifer Authority 210/222-2204
Ferguson Map Company 210/829-7629

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

PROJECT DESCRIPTION

9. __X__ A detailed narrative description of the proposed project is provided directly behind this page.

10. Existing project site conditions are noted below:
__X__ Existing commercial site
____ Existing industrial site
____ Existing residential site
____ Existing paved and/or unpaved roads
____ Undeveloped (Cleared)
____ Undeveloped (Undisturbed/Uncleared)
____ Other: _____

SOLID AND HAZARDOUS WASTES

11. Solid wastes and/or hazardous wastes:

____ There are areas of trash, debris or other solid waste and hazardous waste on this property which will be disposed of properly at an authorized facility prior to commencing construction.
__X__ There are no areas of trash, debris or other solid waste or hazardous waste existing on this property.
____ Other. A narrative description is provided directly behind this page.

12. Will there be any on-site land disposal of Municipal Solid Waste as defined in 30 TAC §330?
____ Yes
__X__ No

PROHIBITED ACTIVITIES

13. __X__ 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 §331 of

RESPONSE TO ITEM NO. 9.0

INTRODUCTION

The following is a description of the proposed project to be conducted at Sac-N-Pac Store No. 604, located at the intersection of purgatory road and highway 306 approximately 10 miles north of New Braunfels, Texas. This item includes a description of the Geologic Assessment(Section 2 of the Application), the UST system(Section 3.0 of the Application), the Water Pollution Abatement Plan Application(Section 3.0 of separate WPAP Application submitted concurrently, includes OSSF letter of Suitability), construction or temporary storm water management plan (Section 5.0 of this application), and the permanent stormwater management plan(Section 6.0 of WPAP application). Figures are located in the appropriate sections. The Figure numbers indicate the Section, and sequence, respectively.

The "project site"(Site) is defined as a commercial 1.75 acre lot owned by Sac-N-Pac, Inc. Sac-N-Pac plans to install a convenience store with fueling capabilities on the project site as referenced in the UST and WPAP applications. The site figures identify the project site area and show physical features including geologic formation and drainage pathways within the general vicinity of the Site. There is an existing water well onsite which is to be maintained as an active well for irrigation and non drinking water supply. A new water well is planned to be drilled on the adjacent lot as a public drinking water well. The water system will be designed and constructed in accordance with the appropriate and applicable TNRCC regulations {30 TAC §290}.

The Site is located on the Edwards Aquifer Recharge Zone(EARZ) as delineated in the Official Edwards Aquifer Recharge Zone Map (30 TAC 313 Subchapter A) Hunter/Sattler Quadrangle(Figure 1.3). The Site is approximately 0.66 miles southeast of the upper recharge boundary , and approximately 5 miles northwest of the lower boundary. The Site is adjacent to a Jacobs Creek which is is an intermittent basin drainage stream. The Creek crosses the upper EARZ boundary approximately 1. 25 ground miles.

GEOLOGICASSESSMENT

Since the project site is located on the EARZ a Geologic Assessment is required in accordance with 30 TAC §313.4. The assessment was conducted by a qualified geologist on September 1, 1998. The following summarizes the findings of the assessment as presented in Section 2.0 of the Application.

The site is located entirely within the recharge zone of the Edwards Aquifer. No downgradient assessment of geology was performed since the 100 year flood zone is not located in the downgradient area. Stratigraphically the site appears to be located within the Dolomitic member of the Edwards Group, Kainer Formation.

During the site geologic investigation two site features were mapped(see Figure 2.1). Feature S-1 is an on-site water well and feature S-2 is a small closed depression. S-1 is completed in the Glen Rose formation. It was identified as being a possible sensitive feature with no or low potential recharge capacity.

Feature S-2 measures approximately 5 foot by 6 foot with 1.5 to 2.5 foot of relief. No significant openings to the subsurface were located in association with this feature. This feature was determined not to be sensitive with no or low potential recharge capacity.

Several animal burrows in and around rocks were noted on-site. These features were not mapped as recharge features due to their small size and lack of apparent connection to the subsurface. The northern boundary of the site is the southern bank of a drainage creek. The creek bed which lies offsite may represent a fault.

In general, the site has significant soil and vegetation cover with some rock outcrop along the creek bank. Most of the outcrop had too much soil and vegetation cover to assess the amount of "in-place rock" versus "float rock". During site grading and tankhold construction activities additional exposure of lithologic features may occur. The tankhole will be assessed for potential recharge features prior to tank placement, and if discovered the TNRCC will be notified, and construction terminated until appropriate action taken.

UST SYSTEM

In general, the design of UST facilities will meet or exceed the technical standards of Subchapter C of 30 TAC 334 regarding for the installation of new petroleum underground storage tanks, as well as 30 TAC 313 relating to the Edwards Aquifer Recharge Zone.

The specific applicable regulations are cited in each pertinent section of Item 5.O of Section 3.0, which also includes a complete equipment and corresponding figures. The following is summarizes the UST system design.

TANK DESIGN

The proposed new UST system will consist of two new double-wall composite Fiberglass Reinforced Plastic(FRP). The tanks will be equipped with a factory-applied external 100 mils fiberglass wrap. Both tank sizes will be 15,000 gallons. Tank 1 will store unleaded gasoline. Tank 2 will consist of two compartments with 8,000 gallon and 7,000 gallon capacities which will store super unleaded gasoline and diesel fuel respectively. Crushed rock will be used for tank bedding and tank hole backfill. Due to the presence of a water well within 150 feet upgradient of the UST system, an external liner is to be installed in the tankhold and pipe chase. The liner is to be fabricated of 20mil NPVC material supported with a geotextile fabric. The liner will be prefabricated to fit the tankhold without any open seams.

FILL TUBE WITH OVERSPILL PREVENTION

The tank fill for each tank will be protected with overspill prevention provided by an automatic shut-off valve set to shut off flow into the tanks when the volume of fuel in the tank reaches 95% of the tank capacity. A 5 gallon spill containment manhole will be fitted on each fill tube at the surface. The drop tube is a complete assembly which includes the automatic shut off valve, a tight-fill fitting and liquid tight lid.

VAPOR VENT SYSTEM

Vapors will be vented from the tanks through an extractor valve located on the vapor recovery riser. The tank vent riser will be equipped with liquid tight cap and adapter). All the vapor recovery lines will be single wall 2" FRP pipe to the vent riser. The vent lines from the gasoline storage tanks will be connected into a common manifold. The diesel tank will have a separate vent line which will run parallel with the gasoline vapor manifold. The gasoline and diesel vent lines will connect to separate risers near the respective pump islands. The risers will be 2" schedule 40 galvanized pipe. The risers will be coupled to the FRP vent line with double 90° galvanized swing coupling fitted with a FRP to pipe thread adapter. A pressure vacuum vent will be threaded on top of the gasoline vapor riser to maintain the required pressure in the storage tanks and prevent vapor loss. The diesel vapor riser will be outfitted with an open vent.

TANK INVENTORY GAUGE

Each tank will be equipped with an automatic product level monitoring system and tied into the central monitoring system as discussed under leak detection system.

PRODUCT PUMP AND PIPING SYSTEM

Each gasoline storage tank will be equipped with a 1.5 horse power, 4-inch diameter submersible pumps. The diesel tank will be equipped with a 3/4 horsepower pump. All product lines will be double wall FRP consisting of a 2" diameter primary pipe and 3" diameter secondary containment pipe. The slope of the product delivery lines will be 1/8" per foot in the direction of the tank. A safety shear/impact valve will be installed on each product line at the dispenser island to assure automatic shut-off of product flow during emergencies. Stainless steel braided flexible connectors will be used to connect the product line to the dispenser unit and to connect the product line to the submersible pump. Each connector will be placed in liquid tight secondary containment sump as discussed under Corrosion Protection Method.

INTERSTITIAL TANK PROBE

An interstitial tank probe will be installed in the monitoring space between the outer FRP wall and inner steel wall located at the end of each tank. The probes will consist of liquid discrimination sensors to detect any liquid which may have intruded into the secondary confined space.

CORROSION PROTECTION METHOD

The primary corrosion protection method is to use FRP for the tanks and product lines as described above. The submersible pump housings and pump end flexible connectors will be placed within a liquid tight high density polyethylene secondary containment sump. The dispenser end flexible connector will also be placed in a liquid tight high density polyethylene secondary containment

sump. The sumps will provide isolation from the corrosive elements of the backfill material while also providing secondary containment for any leaks from the enclosed components. All metal parts exposed to backfill soils will be wrapped with dielectric tape. This includes: the vapor recovery riser at the tank, the below grade vent riser, the fill tube riser, the interstitial tank probe riser, and the automatic tank gauge system riser.

LEAK DETECTION SYSTEM

Each tank will be equipped with a liquid sensor probe installed in the interstitial space between the walls of the double wall tanks, and an automatic tank gauging probe as discussed above.

Each product piping system will be monitored by a liquid discrimination sensor located adjacent to the submersible pump in the secondary containment sump. The product lines will be equipped with an automatic electronic positive flow shut-off sensor designed to stop product flow in the event of a leak, and perform continuous leak detection tests.

All the tank probes and sensors will be connected to a multi-channel central programmable control unit placed in the store building and will provide visual and audible alarms when hydrocarbon liquids, and water is detected. This system will combine tank inventory monitoring and in-tank leak detection.

Two 4-inch diameter slotted(0.020 inches) PVC observation wells will be placed in diagonal corners of the tank pit to detect fuel spills and vapors in the backfilled tank hole area within 35 days. The wells will be installed to a depth of 2 feet below the bottom of the tank to an approximate depth of the 15'.

Each tank riser and observation well will be covered with an appropriate access vault or ("street box") properly covered and designed to divert surface runoff away from the manways.

Temporary Stormwater Management Plan(TSMP)

The Temporary Stormwater management plan is included in Section 4.0 of both the UST and WPAP applications..
The following summarizes the construction storm water management practices to be implemented during construction and before a permanent system is in place. Figure 4.1 and 4.2 in Section 4.0 show the plan detail.

The UST surface area will be covered with concrete, and the new store access and parking areas will be covered with asphalt. Precautions will be taken to contain and collect any wash off from the surfaced area during an intermittent rain. Other than portable containers five gallons or less, equipment fuel will not stored on Site, and equipment will be serviced by offsite vehicles. Care will be taken to minimize spillage and any spills which do occur will be addressed immediately. Construction debris and material will be placed in onsite disposal containers, and disposed in an approved landfill. Excavated soils will be placed in designated stockpile area and enclosed by silt filter fence. The soils will be used on Site for fill and berms-if suitable. Excess soils will be shipped to an appropriate disposal facility.

Site access and egress will be over a stabilized construction entrance/exit. Run on will be prevented from entering the construction areas by installing temporary berm above the construction area. Silt fencing will be placed downgradient of the entire construction area to treat stormwater runoff that may be impacted by the activities. Silt fencing will be placed across the bar ditch at the northwest corner of the property as a secondary backup filter, to assure final discharge adequately treated. The fencing will not be placed to intercept runoff that is not affected by construction activity.

PERMANENT STORMWATER MANAGEMENT PLAN

The project site permanent storm water management plan(SMP) is based on the design criteria for a Retention Basin and irrigation system taken from the Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual dated February 1, 1990 and amended August 12, 1992(referred to as "LCRA Technical Manual"). The calculations and figures are located in the Permanent Storm Water Section(i.e. Section 5.0).

The project site does not receive a significant amount run-on from the upgradient areas due to diversion of run-on by bar ditches along Purgatory Road.

The stormwater from the new facility pad will be diverted by slope design and elevations to converge at the site discharge point in the northwest corner of surfaced area(see Figure 5.1). The converged runoff will be dissipated by a saw tooth

curb and flow into a grated catchment drain box. An 8" Schedule 40 PVC drain pipe will convey the flow from the box into the retention basin located in the north east corner of the project site. The retention basin is designed to collect the first 0.75" of rain from the new facility impervious surface based on the LCRA Technical Manual guidelines using 30% impervious cover for the project site, and 75% reduction of potential pollutant loads. The new facility surface area is calculated to be 24,389 square feet. Therefore, the first 0.75"(0.0625 ft) of rain will produce 1,800 cubic feet of storm water or 13,464 gallons, which is the design capacity of the retention basin from the top(soffit) of the inlet drain pipe, plus an additional one foot freeboard.

The excess storm water above the design capacity will diverted from the basin via an 8" 'T' with a branch extension to the natural drainage to the west of the site. The invert elevation of the branch pipe at the bar ditch will be set at the soffit elevation of the line pipe. Flow carried from new facility impervious cover via the line pipe will flow into the basin until the elevation differential is overcome at it design capacity. The 8" drain pipe is used to handle a 100 year storm in accordance with the LCRA Technical Manual, which is equivalent to approximately 2 cubic feet per second (cfs) for the impervious cover.

Irrigation System

The retention basin will drain via 4" Schedule 40 PVC pipe into a lift station outfitted with a small(1/3 to 1/2 hp) submersible pump. After the rain event the collected water will be pumped from the lift station through a one(1) inch forced main to a sprinkler system which irrigates a dedicated vegetated area set aside specifically for this use. All the water will be pumped out within 72 hours and in 12 hour cycle times at a rate of 6.2 gpm in order not to exceed the 0.1 inch per hour application rate in accordance with the LCRA Technical Manual. The necessary irrigation area requirement is 6,000 square feet. There is more area available.

PURGATORY ROAD

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE

S-1

RAILROAD TIE PLATFORM

SHED

1015

1010

S-2

SITE BOUNDARY

LOG CABIN

1005

45' BUILDING SETBACK

1000

SITE BOUNDARY

EDGE OF PAVEMENT

F.M. HIGHWAY 306

N

0 40 80

(SCALE IN FEET)

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED PROFESSIONAL ENGINEER
11/3/98

FORBES ENVIRONMENTAL ENGINEERING

EXISTING SITE PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 1.9.3

PURGATORY ROAD

EDGE OF PAVEMENT

PROPOSED SEPTIC SYSTEM

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE

S-1

PUMP DISPENSER ISLAND (GAS)

CANOPY

MONITOR WELL

8000 GAL. TANK (SUPER)

S-2

SEPTIC IRRIGATION AREA

SITE BOUNDARY

PROPOSED COMMERCIAL BUILDING

7000 GAL. TANK (DIESEL)

MONITOR WELL

25' BUILDING SETBACK

10' UTILITY EASEMENT

HIGHWAY RIGHT-OF-WAY

EDGE OF PAVEMENT

1000

1005

1009

1010

1011

1012

1013

1014

1015

PROPOSED RETENTION BASIN
(1,800 CU. FT. CAPACITY)

RETENTION BASIN IRRIGATION AREA

SITE BOUNDARY

F.M. HIGHWAY 306

N

0 40 80
(SCALE IN FEET)

MAP LEGEND

➡ = Site Pad Drainage

● S-1 = Geologic Feature
Existing Water Well
None/Low Potential
Recharge

● S-2 = Geologic Feature
Closed Depression
None/Low Potential
Recharge

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED
ENGINEER
11/3/98

FORBES ENVIRONMENTAL ENGINEERING, INC.

FINISHED SITE PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 1.9.4

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).

14. N/A 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 §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

15. Under 30 TAC §213.14, application fees are due and payable at the time the application is filed. I understand that if the correct fee is not submitted, the TNRCC 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:

____ Austin central office

____ Austin regional office (for projects in Hays, Travis, and Williamson Counties)

__X__ San Antonio regional office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

16. __X__ One (1) original and three (3) copies of the completed application shall be submitted to the appropriate Regional Office for distribution by the TNRCC to the local municipality or county, groundwater conservation districts, and the TNRCC's Central Office.

17. __X__ All items required for this development, as listed in the **APPLICATION GUIDELINES**, are attached.

18. As applicant for the proposed project I am aware that:

__X__ **It is the applicant's responsibility to use the current TNRCC Edwards Aquifer application forms.**

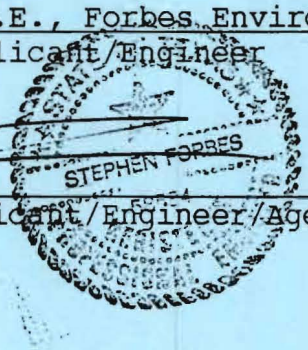
__X__ The executive director must declare that the application is administratively complete or deficient within 30 days of receipt by the appropriate regional office and must complete

the review of an application within 90 days after determining that it is administratively complete. Grounds for a deficient application include, but are not limited to, failure to pay all applicable application fees.

__X__ No person shall commence any regulated activity until a Water Pollution Abatement Plan for such activity has been filed with and approved by the TNRCC.

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 TNRCC review. The application was prepared by:

STEPHEN FORBES, P.E., Forbes Environmental Engineering, Inc.
Print Name of Applicant/Engineer



Signature of Applicant/Engineer/Agent

11/3/98
Date

GEOLOGIC ASSESSMENT

FOR

REGULATED ACTIVITIES

ON THE EDWARDS AQUIFER RECHARGE/TRANSITION ZONES
AND RELATING TO 30 TAC §213.5(b)(3), EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: Purgatory Road Sac-N-Pac Store #604

TYPE OF PROJECT: x WPAP ____ AST ____ SCS ____ UST

PROJECT INFORMATION

1. Project is on the: x Recharge Zone ___ Transition Zone ___ Both

Recharge Zone Boundary:

____ The Recharge Zone boundary is located on-site. **This Geologic Assessment includes a description of the geologic or manmade features identified on-site.**

____ The Recharge Zone boundary is located within the downgradient area.

x The Recharge Zone boundary is not located within the downgradient area.

2. **100-year floodplain boundaries:**

____ The 100-year floodplain is located on-site. **This Geologic Assessment includes a description of the geologic or manmade features identified on-site and within the 100-year floodplain downgradient of the site for a distance of one-half mile or to the Recharge Zone boundary, whichever is less.**

____ The 100-year floodplain is located downgradient of the site within a distance of one-half mile or the Recharge Zone boundary, whichever is less. **This Geologic Assessment includes a description of the geologic or manmade features identified on-site and within the 100-year floodplain downgradient of the site for a distance of one-half mile or to the Recharge Zone boundary, whichever is less.**

x No part of the area downgradient of the site is located within the 100-year floodplain. **This Geologic Assessment includes a description of the geologic or manmade features identified on-site.**

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s):
FIRM, Comal County Texas & Unincorporated Areas, Panel No. 4854630090 C, September 29, 1986.

3. ____ This project is part of a multi-phase project. The Geologic Assessment is site specific and covers only that area undergoing review at this time.
__x__ This is not a multi-phase project.

4. __x__ Geologic or manmade features are described and evaluated using the attached GEOLOGIC ASSESSMENT TABLE.

5. Soil cover on the project site is __0 - 1.5__ feet thick. In general, the soil present appears to have the ability to:

____ transmit fluid flow to the subsurface.
__X__ impede fluid flow to the subsurface.

6. __x__ A **stratigraphic column(s)** is attached **directly behind this page.** The outcropping unit is at the top of the stratigraphic column.

7. __x__ A narrative description of the site specific geology for this project is provided directly behind this page.

8. __x__ Appropriate Geologic Map(s) are provided:

SITE GEOLOGIC MAP

The Site Geologic Map must be the same scale as the applicant's Site Plan.

Applicant's Site Plan Scale 1" = __40__ '

Site Geologic Map Scale 1" = __40__ '

Items 9 through 13 must be included on the Site Geologic Map.

9. __x__ The Project Site is shown and labeled.

10. __x__ Surface Geologic Units are shown and labeled.

11. **Geologic or manmade features.**

__X__ 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.

Purgatory Road
Sac-N-Pac
Stratigraphic Column

Lower Cretaceous	Edwards Group	Kainer Formation	Dolomitic Member (Exposed at Site Surface)	110 – 130 feet maximum thickness
			Basal Nodular Member	50 – 60 feet maximum thickness
	Glen Rose	Upper Glen Rose	Upper Glen Rose Formation (Lower Confining Unit)	350 – 500 feet maximum thickness

Column based on field assessment and Small and Hansen 1994.

Purgatory Road
Sac-N-Pac
Site Narrative for Geologic Features

This site is located entirely within the recharge zone of the Edwards Aquifer. No downgradient assessment of geology was performed since the 100 year flood zone is not located in the downgradient area. Stratigraphically the site appears to be located within the Dolomitic member of the Edwards Group, Kainer Formation (Small & Hanson 1994). This is based upon the presence of burrowed limestone and the presence of chert. In addition the presence of iron staining in some of the site lithology was noted. Although iron stains are often associated with the Leached Collapsed member of the Edwards, site investigation and personal communication with Ted Small – USGS, concerning this site indicate the Dolomitic member is the outcropping unit for the site.

During the site geologic investigation two site features were mapped. Feature S-1 is an on-site water well and feature S-2 is a small closed depression, possibly indicative of a incipient sinkhole. Although no well log was available, feature S-1 is reportedly a Glen Rose Well. This seems quite likely since the total stratigraphic thickness of the Edwards on-site is estimated at 100 to 190 feet and the Dolomitic and Basal Nodular members are not likely water bearing units in this setting. Feature S-2 measures approximately 5 foot by 6 foot with 1.5 to 2.5 foot of relief. No significant openings to the subsurface were located in association with this feature. Although not found, or noted on the site geologic map, it appears probable a septic system may exist on-site associated with an existing on-site building (planned for removal from the site). If present, the septic system should be removed from the site during site construction activities.

Several animal burrows in and around rocks were noted on-site. These features did not warrant mapping as recharge features due to their small size and lack of apparent connection to the subsurface. The northern boundary of the site is the southern bank of a drainage (dry creek bed) that traverses in an approximate east-west direction north of the site. Although not mapped as a site feature due to its apparent off-site location, this creek may represent a fault mapped by Small and Hanson 1994.

The site in general has significant soil cover and vegetation cover, with some rock outcrop along the creek bank. Most of the outcrop observed had enough soil and vegetative cover to make assessing the amount of "in-place rock" versus "float rock" somewhat difficult. During site grading and tankhold construction activities additional exposure of lithologic features may occur. The tankhold will be assessed for potential recharge features prior to tank placement.

12. ____ The Recharge Zone boundary and the 100-year floodplain is shown and labeled, if appropriate.

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

__x__ There are __1__ (#) 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.
- __x__ The wells are in use and comply with 30 TAC §238.

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

DOWNGRADIENT GEOLOGIC MAP *

Downgradient Geologic Map Scale 1" = __n/a__ '

No downgradient investigation was performed since the floodplain does not exist within the ½ mile downgradient limit.

Items 14 through 16 must be included on the Downgradient Geologic Map.

14. __n/a__ Surface Geologic Units are shown and labeled.

15. **Geologic or manmade features:**

__n/a__ Geologic or manmade features were discovered within the downgradient area. They are shown and labeled on the Downgradient Geologic Map and described in the attached Geologic Assessment Table.

__n/a__ No geologic or manmade features were discovered within the downgradient area.

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

__n/a__ 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 30 TAC §238.

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

ADMINISTRATIVE INFORMATION

17. X One (1) original and three (3) copies of the following forms, in the order listed below, have been provided.
    * **THIS FORM**
    * **GEOLOGIC ASSESSMENT TABLE**
    * **SITE GEOLOGIC MAP**
    * **DOWNGRADIENT GEOLOGIC MAP, if needed**

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 **GEOLOGIC ASSESSMENT** is hereby submitted for TNRCC review. The application was prepared by:

Date(s) Geologic Assessment was performed: 9/1/98
Date(s)

J. MARK HAMILTON — 210-271-0925
Print Name of Geologist — Telephone

210-271-3061
FAX

Signature of Geologist — 9/11/98
Date

Representing: EARTH TECH, INC.
(Name of Company)

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Purgatory Road Sac-N-Pac

FEATURE ID			FEATURE CHARACTERISTICS																								PHYSICAL SETTING																						
1A	1B	1C	2	3				4			5	6		7			8			9				10			11	12			13				14					15	16			17
LOCATION	TYPE (1)	POINTS	GEOLOGIC FORMATION	VERTICAL FEATURE (FEET)			HORIZONTAL FEATURE (FEET)			LENGTH & WIDTH (FEET)	TREND (C, CD, FR, FZ, SC, SH)		DENSITY (FR, VF)			APERTURE (FR, VR)			INFILLING (C, CD, FR, FZ, SC, SH, VR)				RELATIVE INFILTRATION RATE			SUB-TOTAL	SENSITIVITY			DRAINAGE AREA (ACRES)				TOPOGRAPHY (2)					SUB- TOTAL	POTENTIAL RECHARGE			COM-MENTS
				C, CD, SC, SH			C, SC			FZ, FR, VR, Z																																						
				X	Y	Z	X	Y	Z		DIRECTION	DOMINANT	LOW	MODERATE	HIGH	SMALL	MEDIUM	LARGE	CEMENTED	FINE	COARSE	NONE	NONE/LOW	MODERATE	HIGH		NOT <25	POSSIBLE 25 - 60	SENSITIVE >60	<1	<10	<50	>50	WALL	HILLTOP	HILLSIDE	FLOOD PLAIN	STREAM BED		NONE/LOW <15	MODERATE 15 -20	HIGH >20	YES
S-1	MM	35	Kek																							35		35			5				10			15	15			YES
S-2	CD	10	Kek	5	6	1.5													5				0			15	15				5				10			15	15			YES

(1) C = 35, CD = 10, FR = 0, FZ = 15, MM = 35,
SC = 10, SH = 20, VR = 0, ZONE = 35

(2) WALL = Vertical/near veritical wall above 100-yr floodplain
FLOODPLAIN = 100-yr floodplain
STREAM BED = Ordinary High Water Mark

TNRCC - 0629 (2/1/97)

I have read, understood, and followed the Texas Natural Resource Conservation Commission's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.

Geologist signature

9/11/98
Date

Sheet 1 of 1

PURGATORY ROAD

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE

S-1

RAILROAD TIE PLATFORM

SHED

1015

1010

LOG CABIN

25' BUILDING SETBACK

S-2

SITE BOUNDARY

JACOBS CREEK

Kek-D

1005

1000

Kek-D

EDGE OF PAVEMENT

N

F.M. HIGHWAY 306

SITE BOUNDARY

0 40 80

(SCALE IN FEET)

MAP LEGEND

Kek-D = Kainer Formation Dolomitic Member

● S-1 = Site Feature 1 Glen Rose Water Well

● S-2 = Site Feature 2 Closed Depression

Flow Arrow = ←

E E E

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED
PROFESSIONAL ENGINEER
11/3/98

FORBES ENVIRONMENTAL ENGINEERING, INC.

SITE GEOLOGICAL MAP
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 2.8.1

Purgatory Road
Sac-N-Pac
Additional Comments for Geologic Features

Feature S-1: A water well, depth not know, however, reported to be a Glen Rose (Trinity Aquifer) well, not an Edwards Aquifer well. This seems probable, since the Edwards limestones in the site setting are not likely water bearing units.

Feature S-2: A small closed depression along the northern site boundary just inside of the tree line. The feature may represent an incipient sink-hole, or collapse feature. No significant conduit to the subsurface was apparent during the investigation of this feature.

View of intersection of State 306 and Purgatory Road
view is to the south along southern site boundary

View of site looking to the north-northwest

View of site to the north - along the eastern site boundary

View of site to the north - along the western site boundary

View of site feature S-2, a small closed depression

View of tree line along northern portion of site. Feature S-2 is located inside of tree line on right hand side of photo

Purgatory Road
Sac-N-Pac
List of References

Federal Emergency Management Agency, (1991), *FIRM Flood Insurance Rate Map, Comal County, Texas and Unincorporated Areas*, Panel No. 485493 0090 C, September 29, 1986.

Small, Ted A. – Personal communication – September 8, 1998.

Small, Ted A. and Hanson, John A., (1994), *Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Comal County, Texas*, Water Resources Investigations Report 94-4117.

UNDERGROUND HYDROCARBON AND HAZARDOUS SUBSTANCE APPLICATION
FOR STORAGE ON THE
EDWARDS AQUIFER RECHARGE AND TRANSITION ZONES
AND RELATING TO 30 TAC §213.5(d), EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: SAC-N-PAC STORE No. 604

PROJECT DESCRIPTION

1. ____ Project is on the TRANSITION Zone
   __X__ Project is on the RECHARGE Zone

2. Underground storage tank (UST) information:

UST Number	Size (Gallons)	Substance to be Stored	Double-wall Tank Material
1	15,000	UNLEADED FUEL	FRP
2	8,000	SUPER FUEL	FRP
2	7,000	DIESEL	FRP

__X__ This installation will use fiberglass-reinforced plastic or polyester tanks which meet UL Standard 1316 or ASTM Standard D 4021 as appropriate.
_____ This installation will use steel tanks which meet STI Standards, UL Standard 58, or other applicable UL standards for double-wall steel tanks.
_____ This installation will use tanks other than fiberglass reinforced or steel.

Information required by 30 TAC 334.43 relating to Variances and Alternative Procedures is attached directly behind this page.

3. A Water Pollution Abatement Plan (WPAP) is required for construction of any associated commercial, industrial or residential project located on the Recharge Zone.

____ The WPAP application for this project was approved by letter dated _____. A copy of the approval letter is attached at the end of this application.
__X__ The WPAP application for this project was submitted to the TNRCC concurrent with this application, but has not been approved.
____ A WPAP application is required for an associated project, but it has not been submitted.
____ There will be no building or structure associated with this project. In the event a building or structure is needed in the future I will submit the required WPAP for approval consideration to the TNRCC.
____ The proposed UST is located on the **Transition Zone** and a WPAP is not required.

4. **Any new underground hydrocarbon and hazardous substance storage tank system that does not incorporate a method for tertiary containment shall be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature as required by 30 TAC §213.5(d)(1)(B).**

_____ This underground hydrocarbon and hazardous substance storage tank system is not to be installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

__X__ This underground hydrocarbon and hazardous substance storage tank system is to be installed within 150 feet of a **domestic**, industrial, irrigation, or public **water supply well**, or other sensitive feature and tertiary containment is provided. A description of the method to provide tertiary containment is provided directly behind this page(see Items 5.1 and 5.5).

UST SYSTEM

5. A detailed narrative description of this project will be provided directly behind this page.

6. New UST corrosion protection equipment to be installed:

Equipment	Corrosion Protection (Method)	Comments
Tanks	FIBERGLASS REINFORCED PLASTIC	
Piping	FIBERGLASS REINFORCED PLASTIC	
Submersible Pumps	SUBMERSIBLE PUMP CONNECTIONS WILL BE PLACED IN A LIQUID TIGHT HIGH DENSITY POLYETHYLENE SECONDARY CONTAINMENT SUMP	
Flex Connector (dispenser end)	FLEX CONNECTOR WILL BE PLACED IN A LIQUID TIGHT HIGH DENSITY POLYETHYLENE SECONDARY CONTAINMENT SUMP	
Flex connector (pump end)	FLEX CONNECTOR WILL BE PLACED IN A LIQUID TIGHT HIGH DENSITY POLYETHYLENE SECONDARY CONTAINMENT SUMP	
Vapor recovery piping	WRAPPED WITH DIELECTRIC TAPE	
Drop tubes	ISOLATION INSIDE TANK	

7. The depth of the tank excavation will be sufficient to accommodate piping fall requirements, tank diameter, bedding, and a minimum cover of three (3) feet [30 TAC §334.46]. The depth of the tank excavation will be __15__ feet.

RESPONSE TO ITEM 5

5.0 DETAILED DESCRIPTION OF UST SYSTEM

In general, the design of UST facilities will meet or exceed the technical standards of Subchapter C of 30 TAC 334 regarding for the installation of new petroleum underground storage tanks, as well as 30 TAC 313 relating to the Edwards Aquifer Recharge Zone. The specific applicable regulations are cited in each pertinent section.

The bold equipment reference numbers shown in parenthesis {e.g. **(1)**} correspond to the attached equipment list indicating manufacturer and model and the respective numbers shown in the correlated figures. The bold letters{e.g. **(A)**} refer to drawing cross section details.

5.1 TANK DESIGN

The proposed new UST system will consist of two new double-wall composite Fiberglass Reinforced Plastic(FRP). The tanks will be equipped with a factory-applied external 100 mils fiberglass wrap. Both tank sizes will be 15,000 gallons. Tank 1**(1)** will store unleaded gasoline. Tank 2**(2)** will consist of two compartments with 8,000 gallon and 7,000 gallon capacities which will store super unleaded gasoline and diesel fuel respectively. Crushed rock will be used for tank bedding and tank hole backfill. Due to the presence of water well within 150 feet upgradient of the UST system, an external liner is to be installed in the tankhold and pipe chase. The liner is to be fabricated of 20mil NPVC material supported with a geotextile fabric. The liner will be prefabricated to fit the tankhold without any open seams.

Applicable Technical Standards:

30 TAC§334.45(b)(1)(D)	{regarding tank construction}.
30 TAC§334.45(d)(3)(A)	{regarding double wall secondary containment}.
30 TAC§334.45(d)(3)(B)	{regarding external liner, i.e. tertiary containment}.
30 TAC§334.46(a)(5)(1)	{regarding bedding and backfill}.

5.2 FILL TUBE WITH OVERSPILL PREVENTION**(A)**

The tank fill for each tank will be protected with overspill prevention provided by an automatic shut-off valve**(15)**, set to shut off flow into the tanks when the volume of fuel in the tank reaches 95% of the tank capacity. A 5 gallon spill containment manhole**(14)** will be fitted on each fill tube at the surface. The drop tube**(13)** is a complete assembly which includes the automatic shut off valve, a tight-fill fitting and liquid tight lid**(22)**.

Applicable Technical Standards:

30 TAC§334.45(e)(2)	{regarding fill pipes}.
30 TAC §334.51(b)(2)(A)	{regarding Spill & Overfill Prevention & Control}.
30 TAC §334.51(b)(2)(B)	{regarding Spill & Overfill Prevention & Control}.
30 TAC §334.51(b)(2)((C)(i & iii)	{regarding Spill & Overfill Prevention & Control}.

5.3 VAPOR VENT SYSTEM**(B)**

Vapors will be vented from the tanks through an extractor valve**(23)** located on the vapor recovery riser. The tank vent riser will be equipped with liquid tight cap**(24)** and adaptor**(25)**. All the vapor recovery lines**(7)** will be single wall 2" FRP pipe to the vent riser. The vent lines from the gasoline storage tanks will be connected into a common manifold. The diesel tank will have a separate vent line which will run parallel with the gasoline vapor manifold. The gasoline and diesel vent lines will connect to separate risers near the respective pump islands. The risers will be 2" schedule 40 galvanized pipe**(28)**. The risers will be coupled to the FRP vent line with double 90° galvanized swing coupling **(27)** fitted with a FRP to pipe thread adapter**(26)**. A pressure vacuum vent**(29)** will be threaded on top of the gasoline vapor riser to maintain the required pressure in the storage tanks and prevent vapor loss. The diesel vapor riser will be outfitted with an open vent**(30)**.

Applicable Technical Standards:

30 TAC§334.45(c)(1)(A)	{regarding pipe material}.
30 TAC§334.45(e)(1)	{regarding vent lines}.
30 TAC§334.49(b)(6)	{regarding corrosion protection}.

5.4 TANK INVENTORY GAUGE**(B)**

Each tank will be equipped with an automatic product level monitoring system**(19)** and tied into the central monitoring system as discussed under leak detection system.

Applicable Technical Standard:

30 TAC§334.50(d)(4)(A&B) {regarding release detection}.

5.5PRODUCT PUMP AND PIPING SYSTEM**(C)**

Each gasoline storage tank will be equipped with a 1.5 horse power, 4-inch diameter submersible pumps**(4)**. The diesel tank will be equipped with a 3/4 horse power pump**(4a)**. All product lines will be double wall FRP consisting of a 2" diameter primary pipe**(5)** and 3" diameter secondary containment pipe**(6)**. The slope of the product delivery lines will be 1/8" per foot in the direction of the tank. A safety shear/impact valve**(12)** will be installed on each product line at the dispenser island to assure automatic shut-off of product flow during emergencies. Stainless steel braided flexible connectors will be used to connect the product line to the dispenser unit**(8)** and to connect the product line to the submersible pump**(9)**. Each connector will be placed in liquid tight secondary containment sump as discussed under Corrosion Protection Method.

Applicable Technical Standards:

30 TAC§334.45(c)(1)(A) {regarding pipe material}.
30 TAC§334.45(d)(4)(A) {regarding secondary containment for piping}.
30 TAC§334.45(d)(4)(B) {regarding external liner, i.e. tertiary containment}.
30 TAC§334.45(c)(3)(a) {regarding shear/impact valve}.
30 TAC§334.45(c)(3)(b) {regarding flexible connectors}.
30 TAC§334.46(c)(2) {regarding pipe slope}.

5.6 INTERSTITIAL TANK PROBE**(D)**

An interstitial tank probe**(18)** will be installed in the monitoring space between the outer FRP wall and inner steel wall located at the end of each tank. The probes will consist of liquid discrimination sensors to detect any liquid which may have intruded into the secondary confined space.

Applicable Technical Standards:

30 TAC§334.50(d)(7) {regarding leak detection}.

5.7 CORROSION PROTECTION METHOD

The primary corrosion protection method is to use FRP for the tanks and product lines as described above. The submersible pump housings and pump end flexible connectors will be placed within a liquid tight high density polyethylene secondary containment sump **(11)**. The dispenser end flexible connector will also be placed in a liquid tight high density polyethylene secondary containment sump**(10)**. The sumps will provide isolation from the corrosive elements of the backfill material while also providing secondary containment for any leaks from the enclosed components. All metal parts exposed to backfill soils will be wrapped with dielectric tape**(31)**. This includes: the vapor recovery riser at the tank, the below grade vent riser, the fill tube riser, the interstitial tank probe riser, and the automatic tank gauge system riser.

Applicable Technical Standards:

30 TAC§334.49(b)(3) {regarding corrosion protection}.
30 TAC§334.49(b)(6) {regarding corrosion protection}.

5.8 LEAK DETECTION SYSTEM

Each tank will be equipped with a liquid sensor probe**(18)** installed in the interstitial space between the walls of the double wall tanks, and an automatic tank gauging probe**(19)** as discussed above.

Each product piping system will be monitored by a liquid discrimination sensor**(20)** located adjacent to the submersible pump in the secondary containment sump. The product lines will be equipped with an automatic electronic positive flow shut-off sensor**(21)** designed to stop product flow in the event of a leak, and perform continuous leak detection tests.

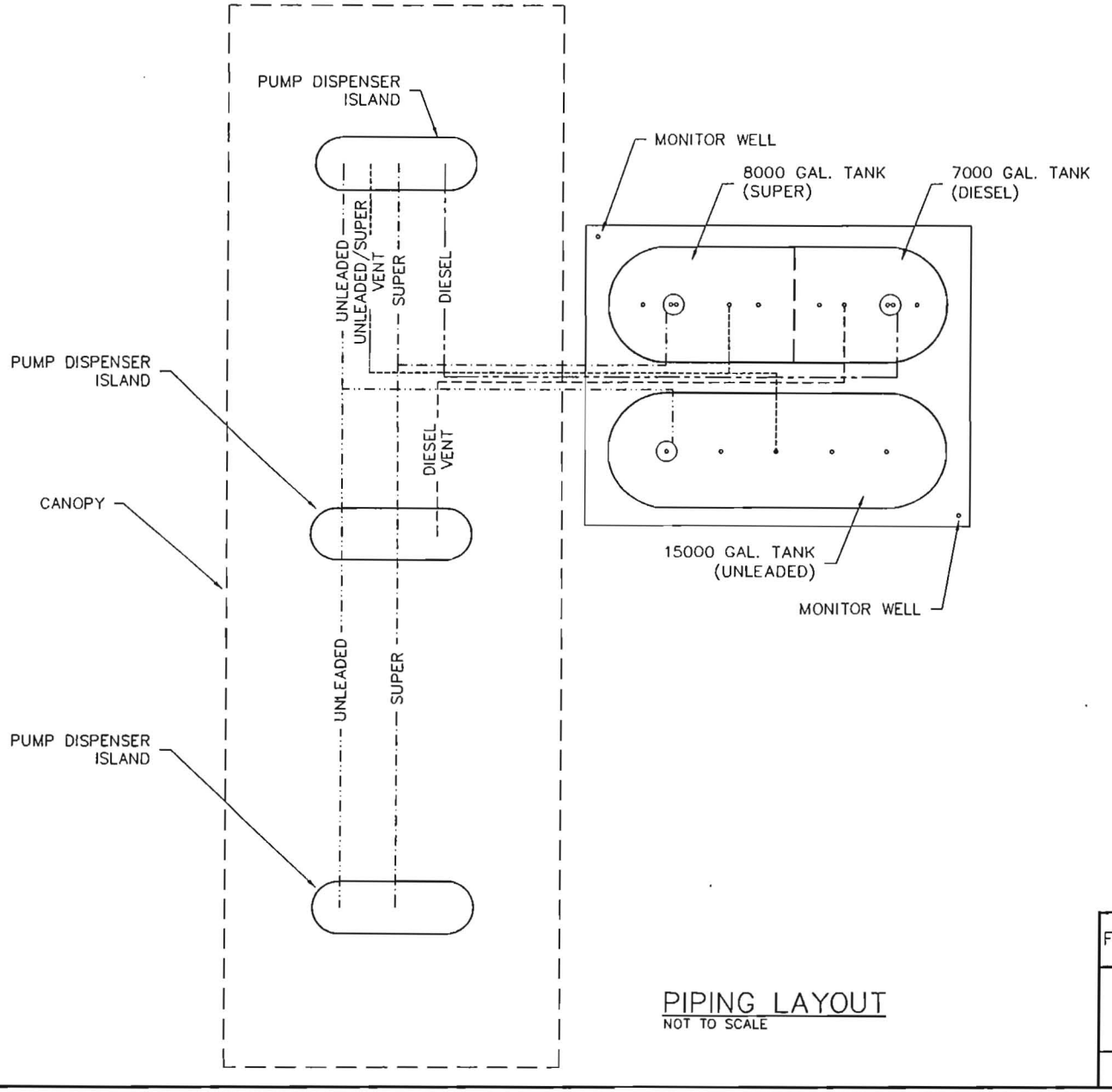
All the tank probes and sensors will be connected to a multi-channel central programmable control unit**(17)** placed in the store building and will provide visual and audible alarms when hydrocarbon liquids, and water is detected. This system will combine tank inventory monitoring and in-tank leak detection. The system is in compliance with EPA regulation 40 CFR Part 280 for performing continuous leak detection tests, and is certified by 3rd party

Two 4-inch diameter slotted(0.020 inches) PVC observation wells**(16)** will be placed in diagonal corners of the tank pit to detect fuel spills and vapors in the backfilled tank hole area within 35 days. The wells will be installed to a depth of 2 feet below the bottom of the tank to an approximate depth of the 15'.

Each tank riser and observation well will be covered with an appropriate access vault or ("street box") properly covered and designed to divert surface runoff away from the manways**(32-36)**.

Applicable Technical Standards:

30 TAC§334.50(c)(B)	{regarding release detection in secondary containment}.
30 TAC§334.50(b)(2)	{regarding release detection in piping}.
30 TAC§334.50(d)(5)	{regarding vapor monitoring in backfill}
30 TAC§334.50(d)(6)	{regarding vapor monitoring groundwater}
30 TAC§334.45(e)(4)(B)(ii)	{regarding number of observation wells}
30 TAC§334.46(g)	{regarding observation well installation}



PIPING LAYOUT
NOT TO SCALE

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58584
REGISTERED
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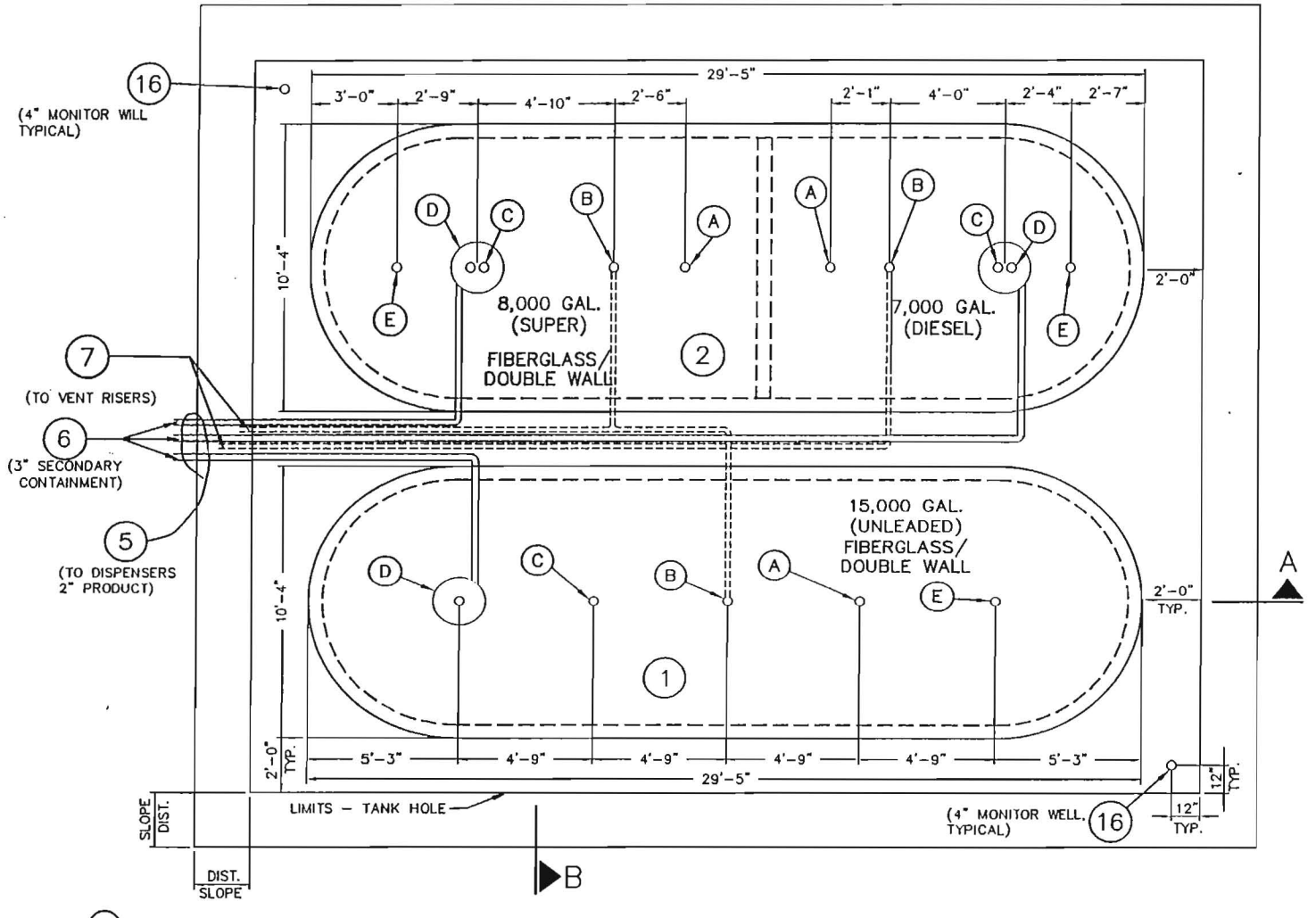
UST SYSTEM LAYOUT
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.5.1



(A) FILL TUBE WITH OVERFILL PROTECTION
(B) VAPOR VENT
(C) TANK INVENTORY GUAGE
(D) SUBMERSIBLE PUMP
(E) INTERSTITIAL TANK PROBE

TANK LAYOUT

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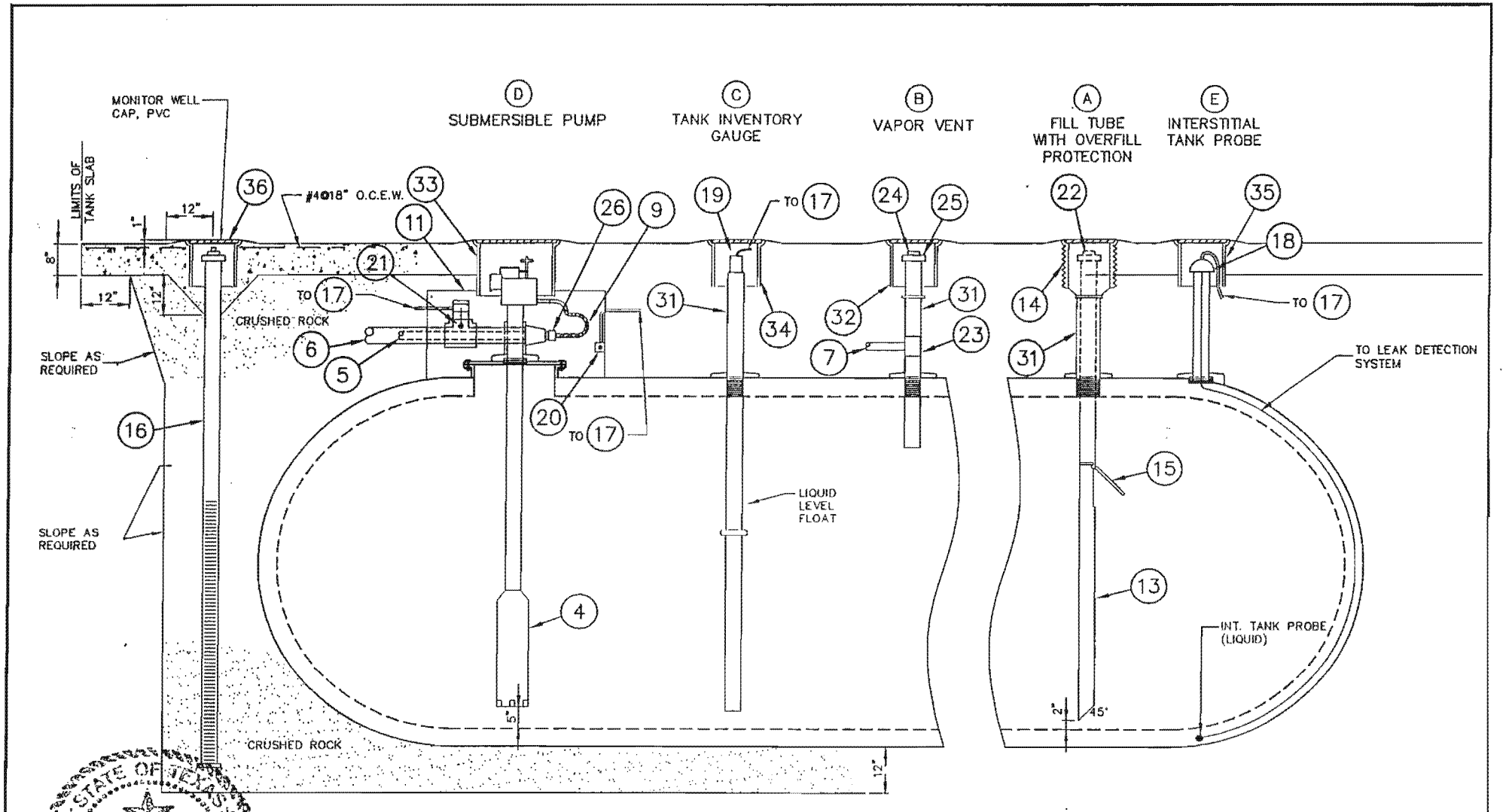
TANK LAYOUT
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.5.2



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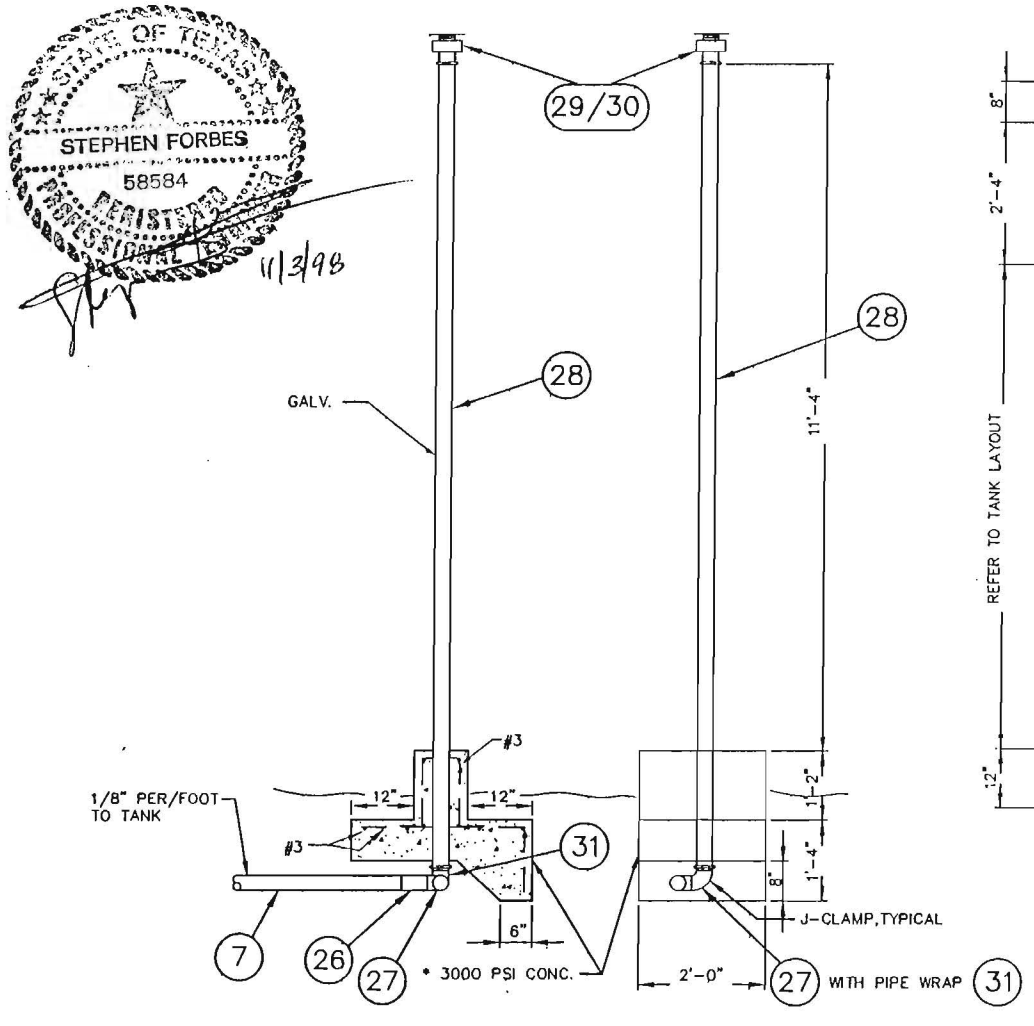
SECTION A

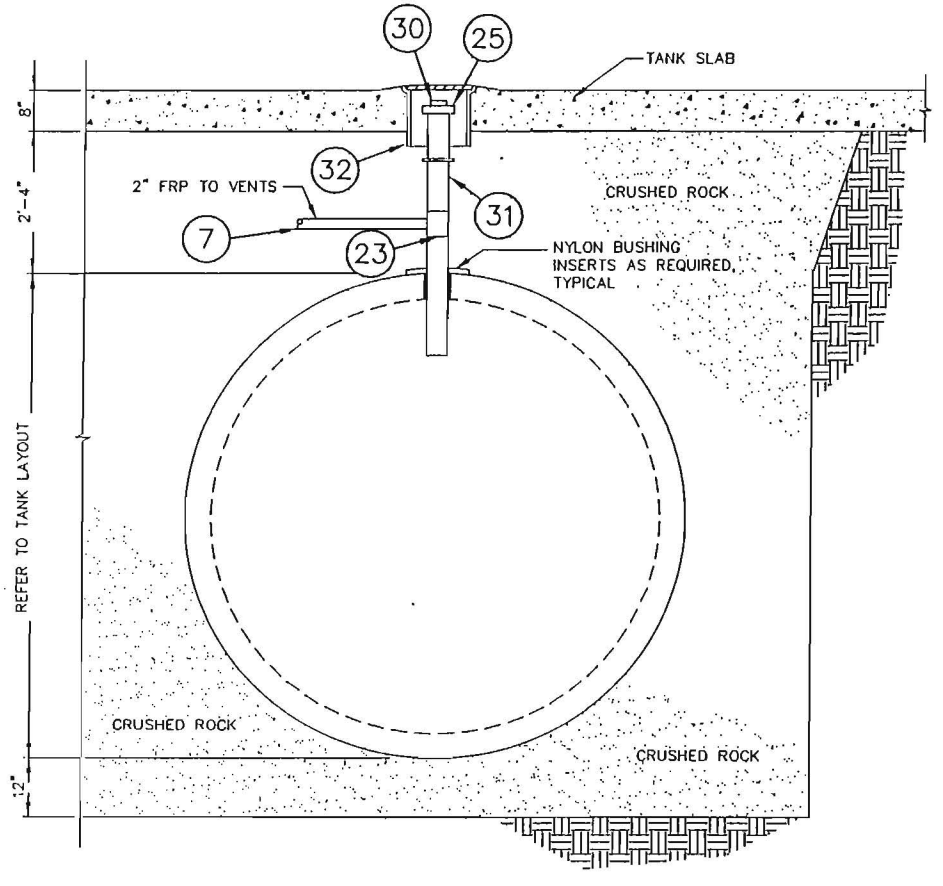
FORBES ENVIRONMENTAL ENGINEERING, INC.

TYPICAL TANK SECTION
SAC–N–PAC
COMAL COUNTY, TEXAS

FIGURE 3.5.3



VENT PIPE RISERS

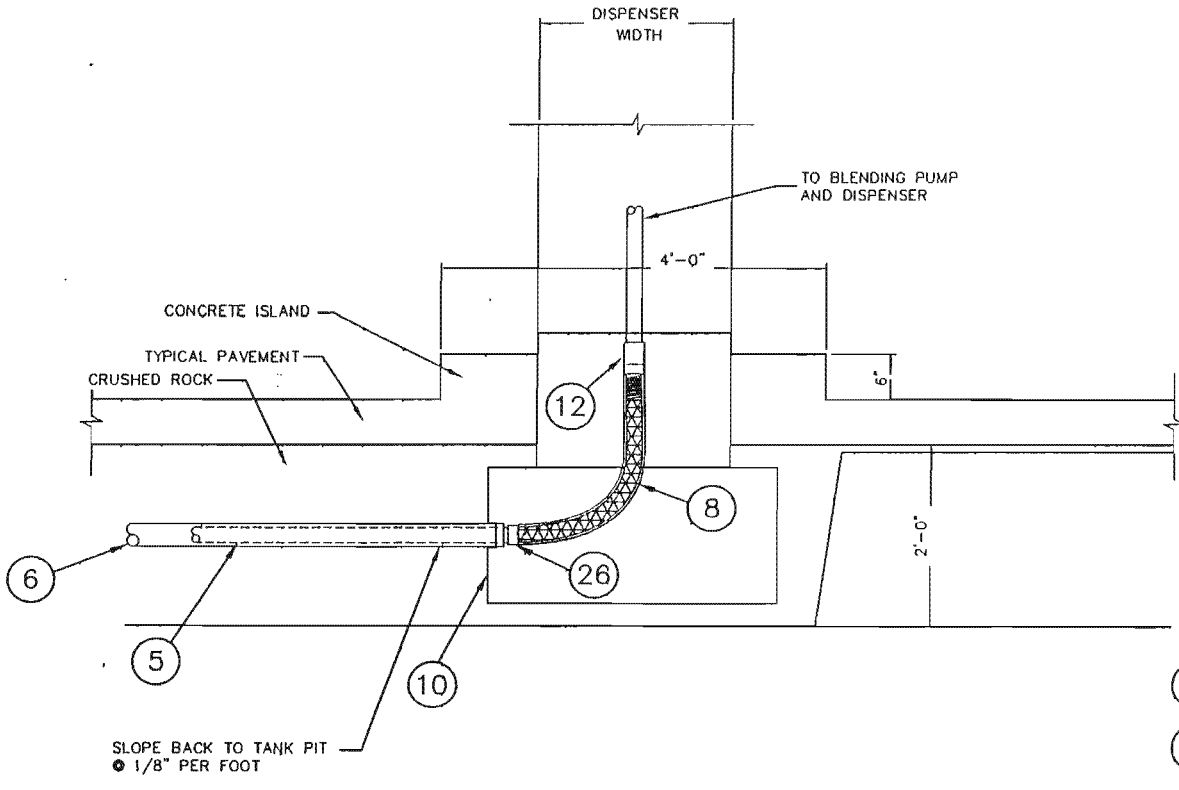


SECTION B
VAPOR RECOVERY

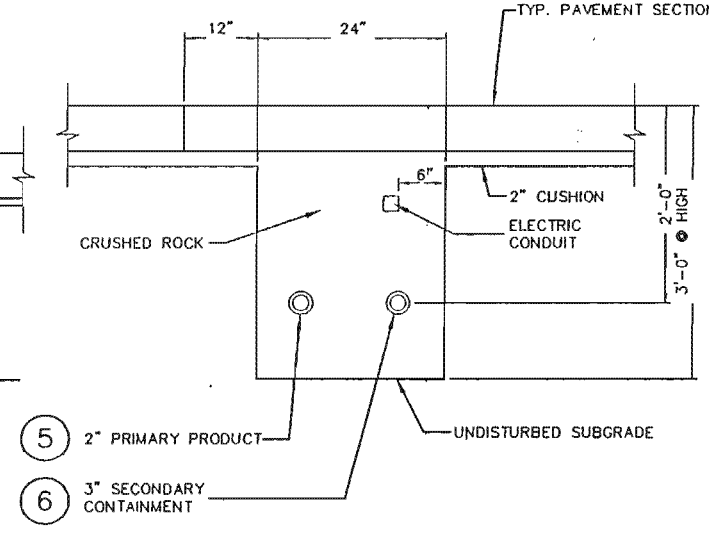
FORBES ENVIRONMENTAL ENGINEERING

TANK SECTIONS
SAC-N-PAC
COMAL COUNTY, TEXAS

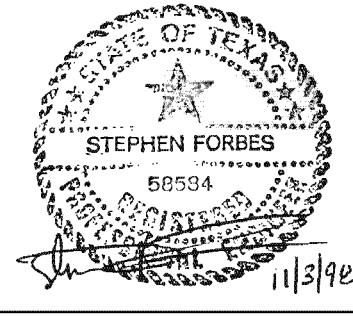
FIGURE 3.5.4



DISPENSER CONNECTION



TRENCH DETAIL



FORBES ENVIRONMENTAL ENGINEERING

DISPENSER & TRENCH DETAIL MAP
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.5.5

UST EQUIPMENT LIST
(Sac N Pac Store #604)

REFERENCE NO.	EQUIPMENT	MANUFACTURER	MODEL #	COMMENTS
NEW UST EQUIPMENT TO BE INSTALLED				
	FRP Double Wall USTs			
1	15,000 gallons	XERXES	DWT 15000	Unleaded gasoline
2	8,000 gallons	XERXES	DWT 8000/7000	Super unleaded gasoline
2	7,000 gallons	XERXES	DWT8000/7000	Diesel
4	Submersible Pumps	Red Jacket	P150S1-19-909	2 gasoline 1.5 hp
4a	Submersible pump	Red Jacket	P75-1--909	1 diesel 3/4
5	2" diameter primary product pipe(FRP)	AO Smith	Red Thread II	FRP
6	3" diameter secondary pipe(FRP)	AO Smith	Red Thread II	FRP
7	Single-wall Stage II vapor recovery pipe	AO Smith	Red Thread II	2" FRP
	Flexible connectors			
8	Dispenser end	Hosemaster	FSMM 1 1/2 x 24	Std. Stainless steel braid
9	Pump end	Hosemaster	FSMM 2 x 24	Std. Stainless steel braid
	Flexible connectors secondary containment			
10	Dispenser end	Total Containment	DV4816	High density polyethylene
11	Pump end	Total Containment	SM42331A	High density polyethylene
12	Shear/Impact Valves	OPW	10BM	
13	Drop Tubes	OPW	6IT736B	4"
14	Spill Containers	OPW	1C-2100	5 gallons
15	Overfill prevention valves	OPW	61SO-4000	Set @ 95% tank capacity
See 17	Audible or visual overfill alarms	Red Jacket	ST1401L	
16	Observation wells	Environmental Well	PVC Sch 40	4" X ±15', 0.020" slots
RELEASE DETECTION EQUIPMENT				
17	Central on-site monitor	Red Jacket	ST1401L	Items 18,19,20 & 21 monitor
18	Interstitial tank probe	Red Jacket	RE400-180-5	Liquid sensor
19	Tank gauge probe	Red Jacket	RE400-561-5	Auto. product inventory
20	Pump/Manway sump probe	Red Jacket	RE400-111-5	Liquid sensor
21	Automatic(electronic) line leak detectors	Red Jacket	RE400-612-5	Auto. shutoff/cont. leak tests
ADDITIONAL EQUIPMENT				
22	Fill Cap	OPW	634-TT-7085	
23	Extractor valve	OPW	233-V-4420	
24	Vapor recovery cap	OPW	1711-T7085	
25	Vapor recovery adaptor	OPW	1611-AV-1625	
26	FPR to Thread(mpt) adaptor	AO Smith	Red Thread II	
27	Double 90° galvanized swing coupling	Wheatland Tube	Sch 40 Galv fpt	2"
28	Vent galvanized riser with coupling	Wheatland Tube	Sch 40 Galv mpt	2"
	Vapor riser vents			
29	Gasoline	OPW	523-1100	Pressure vacuum vent
30	Diesel	OPW	23-0033	Open vent
31	Dielectric Pipe Wrap	Tapecoat	Tapecoat 20	
32	Vapor riser -Street box	OPW	104-A-1066	12"
33	Submersible pump -Street box	Pemco	106 36X10	36"
34	Tank Inventory gauge-Street box	Pemco	106 18X10	18"
35	Interstitial Test Port - Street box	OPW	104-A-1066	12"
36	Observation well-Street box	Pemco	103 12x12	12"

8. The minimum thickness of the tank bedding will conform to 30 TAC §334.46(a)(5)(C and D).The tank bedding thickness will be __12__ inches.

9. The material to be used as backfill will conform to 30 TAC §334.46(a)(5)(A) and will consist of:
   _____Clean washed non-corrosive sand (Sand backfill is not allowed if the tankhold is excavated by blasting.)
   _____Pea gravel.
   __X__Crushed rock.
   _____Other: _____

10. The slope of the product delivery line(s) will conform to 30 TAC §334.46(c)(2) and will be __1/8"__ (1/8" per foot minimum).

11. The type of overfill protection as required under 30 TAC §334.51(b)(2)(C) will consist of:

   _____Overfill prevention restrictor positioned at **90%** capacity.
   __X__Overfill prevention valve positioned at **95%** capacity.
   _____Overfill audible and visual alarm positioned at **90%** capacity.

12. __X__The installers of the release detection equipment are certified as required by 30 TAC §213.5(d)(1)(A).

13. New UST release detection equipment to be installed: (Check all of the following that apply)

   __X__Central on-site monitor
   __X__Interstitial tank probes
   _____Interstitial pipe probes
   __X__Tank gauge probe
   __X__Pump/manway sump probes
   _____Monitor well probes
   _____Mechanical line leak detectors(For pressurized lines only.)
   __X__Automatic (electronic) line leak detectors

14. A narrative description of the initial and continuing training of on-site personnel for operation of release detection equipment, as required by 30 TAC §334.50(a)(1)(B), is provided directly behind this page.

15. A narrative description of the program and schedule for maintaining release detection and cathodic protection equipment, per 30 TAC§334.50(a)(1)(B), is provided directly behind this page.

RESPONSE TO ITEM NO. 14

Description of initial training of onsite personnel for operation of release detection equipment

Upon completion of installation of the new UST facility, the installer on behalf of the equipment manufacturer will provide training to the onsite personnel for the operation and monitoring of the release detection equipment. The training will include a review of all operating procedures, maintenance, calibration, emergency response, and record keeping, in compliance with 30 TAC Subchapter 334.50(a)(1)(B).

Description of continuing training of onsite personnel for operation of release detection equipment

The system operations maintenance supervisor and site manager will be adequately familiar with the release detection equipment operations and maintenance to provide periodic update training of onsite personnel to assure they are sufficiently trained to monitor release detection equipment, in compliance with 30 TAC Subchapter 334.50(a)(1)(B).

RESPONSE TO ITEM NO. 15

Description of program and schedule for maintaining release detection equipment

All the release detection equipment will be tested on an annual basis by the installer on behalf of the equipment manufacturer. Records of all release detection operations including installation, manufacturer's performance claims, methods of sampling, testing, monitoring, inventory control reconciliation, and all service, calibration, maintenance and repair will be maintained at least 5 years in compliance with 30 TAC Subchapter 334.50(e)(1) & (2).

SOIL SPOILS AND STOCKPILES AT UST SITES

16. __X__ Temporary **stockpile** areas will have appropriate erosion and sedimentation controls and will be placed on and covered by plastic sheeting.

SITE PLAN

Items 17 through 22 must be included on the Site Plan. (Attached)

17. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = _____40_____ '.

18. __X__ **Layout** of the UST system is shown and labeled.
__X__ **Tanks** clearly labeled
__X__ **Piping** clearly labeled
__X__ **Observation wells** (including depth) clearly labeled
_____ **Test Station** for cathodic protection.

19. **Geologic or manmade features** which are associated with this Underground Static Hydrocarbon and Hazardous Substance Storage Tank facility:

__X__ All **geologic or manmade** features identified in the Geologic Assessment are shown and labeled. If the facility is located on the Recharge Zone, features associated with the facility are those located on-site and those located either one-half mile downgradient or to the Recharge Zone boundary, whichever is shorter, and within the 100-year floodplain. If the facility is located on the Transition Zone, features associated with the facility are those located on-site and 200 feet downgradient.

_____ **No geologic or manmade features** were identified in the Geologic Assessment.

____ A Geologic Assessment is not required; however, **geologic or manmade** features have been found and are shown and labeled.

____ A Geologic Assessment is not required and no **geologic or manmade** features have been found.

20. __X__ **Existing topographic contours** are shown and labeled. The contour interval is ____1____ feet. (Contour interval must not be greater than 5 feet).

21. __X__ **Finished topographic contours** are **shown and labeled.** The contour interval is ____1____ feet. (Contour interval must not be greater than 5 feet).

____ Finished topographic contours will not differ from the existing topographic configuration and are not shown.

PURGATORY ROAD

EDGE OF PAVEMENT

PROPOSED SEPTIC SYSTEM

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE S-1

PUMP DISPENSER ISLAND (GAS)

CANOPY

MONITOR WELL

8000 GAL. TANK (SUPER)

7000 GAL. TANK (DIESEL)

MONITOR WELL

PROPOSED COMMERCIAL BUILDING

S-2

SEPTIC IRRIGATION AREA

SITE BOUNDARY

1015

1014

1013

1012

1011

1010

1009

1008

1007

1005

1000

25' BUILDING SETBACK

10' UTILITY EASEMENT

HIGHWAY RIGHT-OF-WAY

EDGE OF PAVEMENT

PROPOSED RETENTION BASIN
(1,800 CU. FT. CAPACITY)

RETENTION BASIN IRRIGATION AREA

SITE BOUNDARY

F.M. HIGHWAY 306

N

0 40 80
(SCALE IN FEET)

E E E

MAP LEGEND

➡ = Site Pad Drainage

● S-1 = Geologic Feature
Existing Water Well
None/Low Potential
Recharge

● S-2 = Geologic Feature
Closed Depression
None/Low Potential
Recharge

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FORBES ENVIRONMENTAL ENGINEERING, INC.

FINISHED SITE PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.17.7

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

__X__ There are __1__(#) well 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.

__X__ The wells are in use and comply with 30 TAC §238.

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

GEOLOGIC ASSESSMENT

23. A Geologic Assessment is required for the installation of new or replacement tanks. For UST sites on the TRANSITION ZONE **only**, a Downgradient Geologic Map is not required. **(See Section 2.0)**

SITE PROFILE

24. __X__ A profile of the proposed UST system is attached with all components listed in Item 18 shown and labeled.

ADMINISTRATIVE INFORMATION

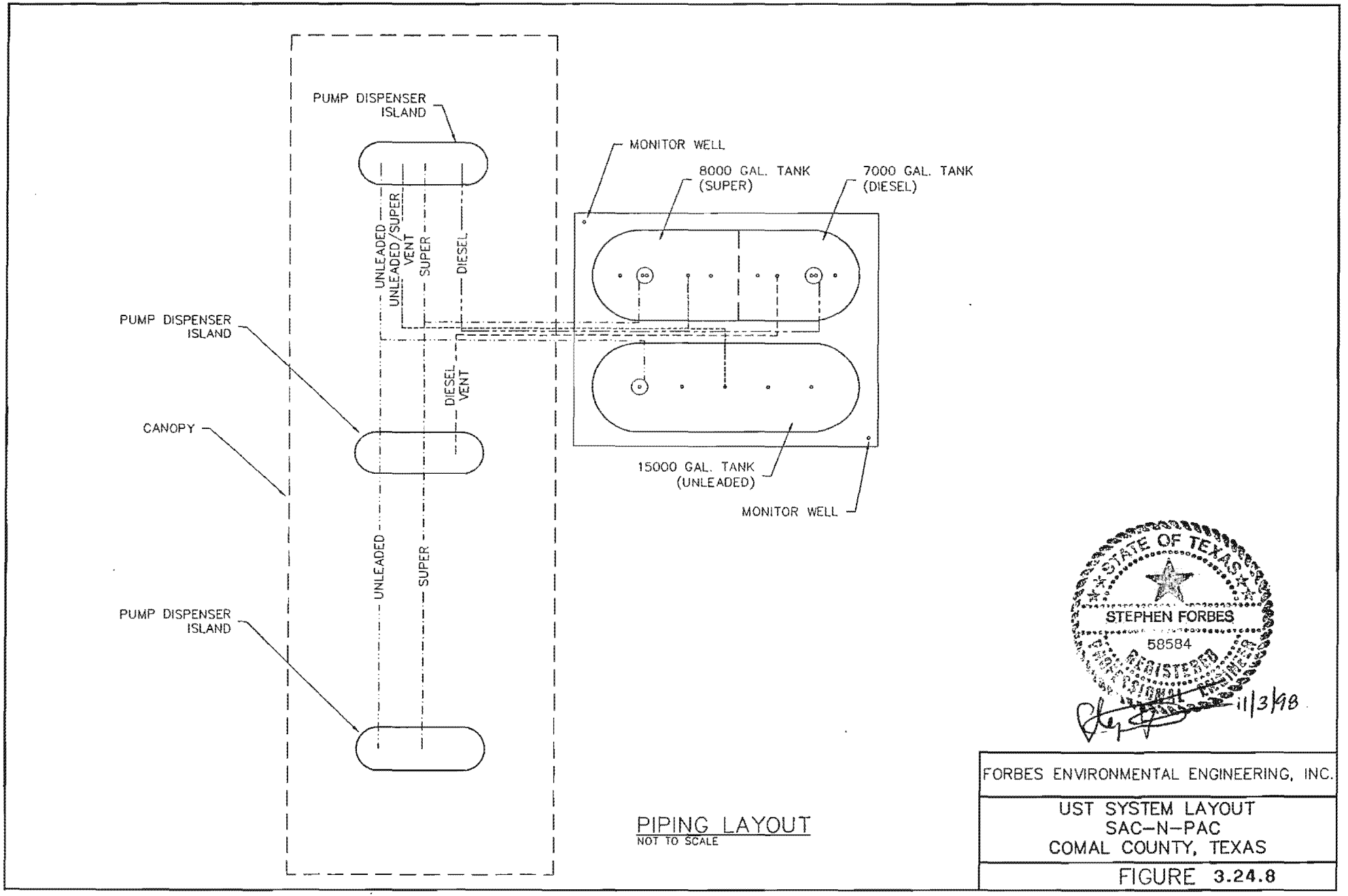
25. __X__ I am aware that this facility is subject to and must meet the requirements of 30 TAC §334, (including but not limited to the 30 day construction notification and reporting and cleanup of surface spills and overfills pursuant to 30 TAC §334.75).

26. __X__ I am aware that upon completion of the tankhold excavation, a geologist must certify that the excavation was inspected for the presence of sensitive features and that the certification must be submitted to the appropriate regional office.

27. __X__ One (1) original and three (3) copies of the following forms, in the **order listed below**, have been provided.

* **GENERAL INFORMATION FORM**
* **GEOLOGIC ASSESSMENT**
* **THIS FORM**
* **TEMPORARY STORMWATER SECTION**
* **PERMANENT STORMWATER SECTION**
* **All THE ADDITIONAL REQUIREMENTS LISTED ON THE APPLICATION GUIDELINES**
* **AGENT AUTHORIZATION FORM,if submitted by agent**
* **FEE FORM**

28. **Any modification of this UST application will require TNRCC approval, prior to construction, and may require**



PIPING LAYOUT
NOT TO SCALE

STATE OF TEXAS
STEPHEN FORBES
58584
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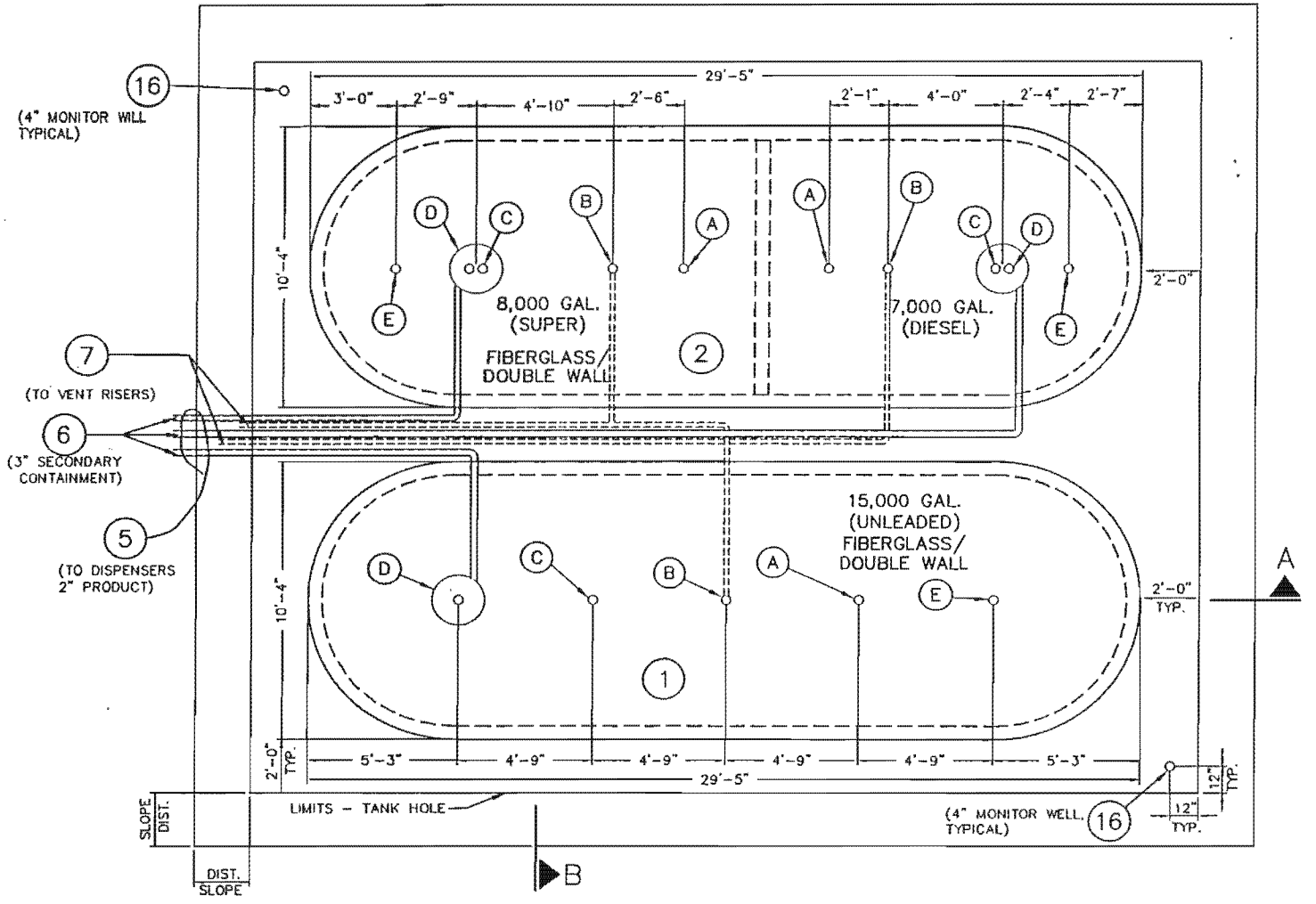
FORBES ENVIRONMENTAL ENGINEERING, INC.

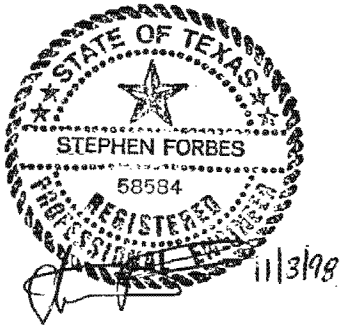
UST SYSTEM LAYOUT
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.24.8



(A) FILL TUBE WITH OVERFILL PROTECTION
(B) VAPOR VENT
(C) TANK INVENTORY GUAGE
(D) SUBMERSIBLE PUMP
(E) INTERSTITIAL TANK PROBE

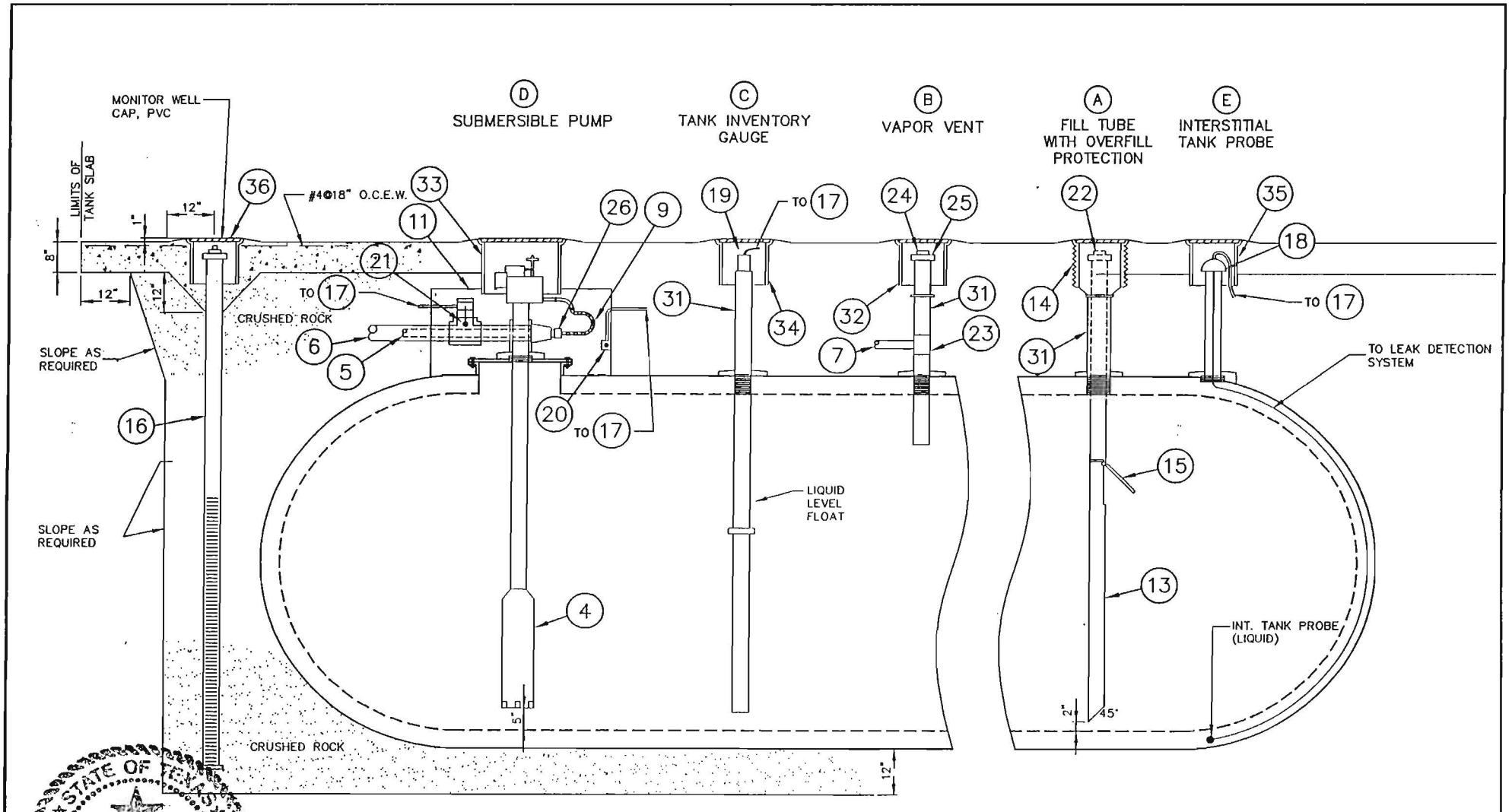
TANK LAYOUT



FORBES ENVIRONMENTAL ENGINEERING, INC.

TANK LAYOUT
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.24.9



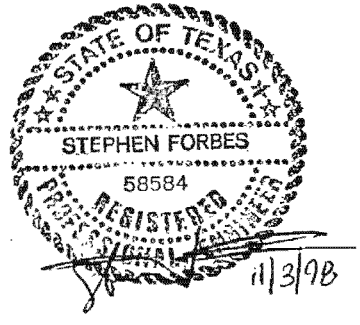
STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED PROFESSIONAL ENGINEER
11/3/90

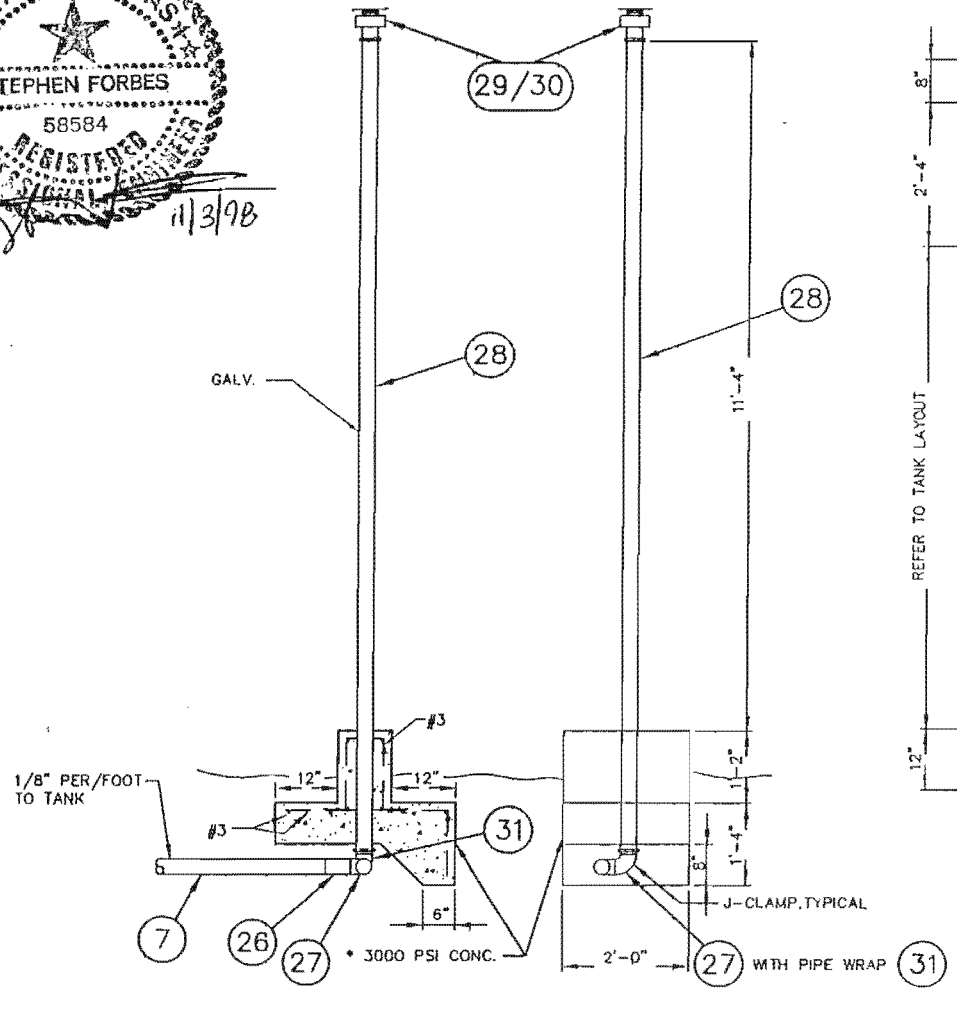
SECTION A

FORBES ENVIRONMENTAL ENGINEERING, INC.

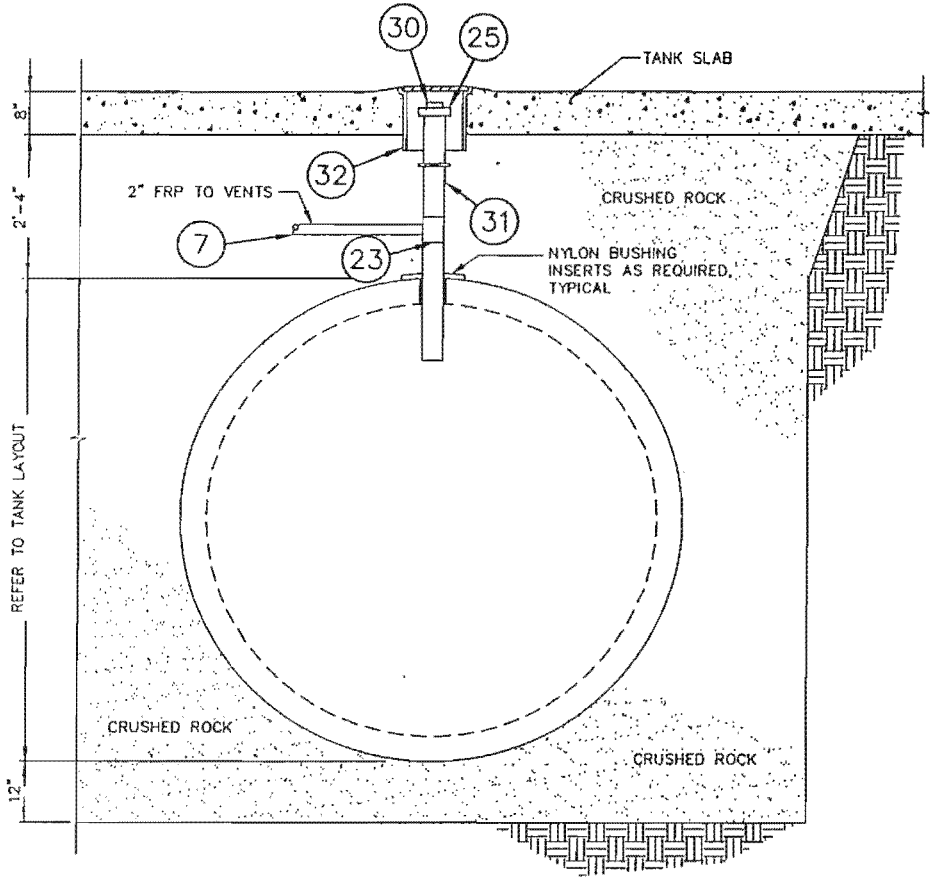
TYPICAL TANK SECTION
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.24.10





VENT PIPE RISERS

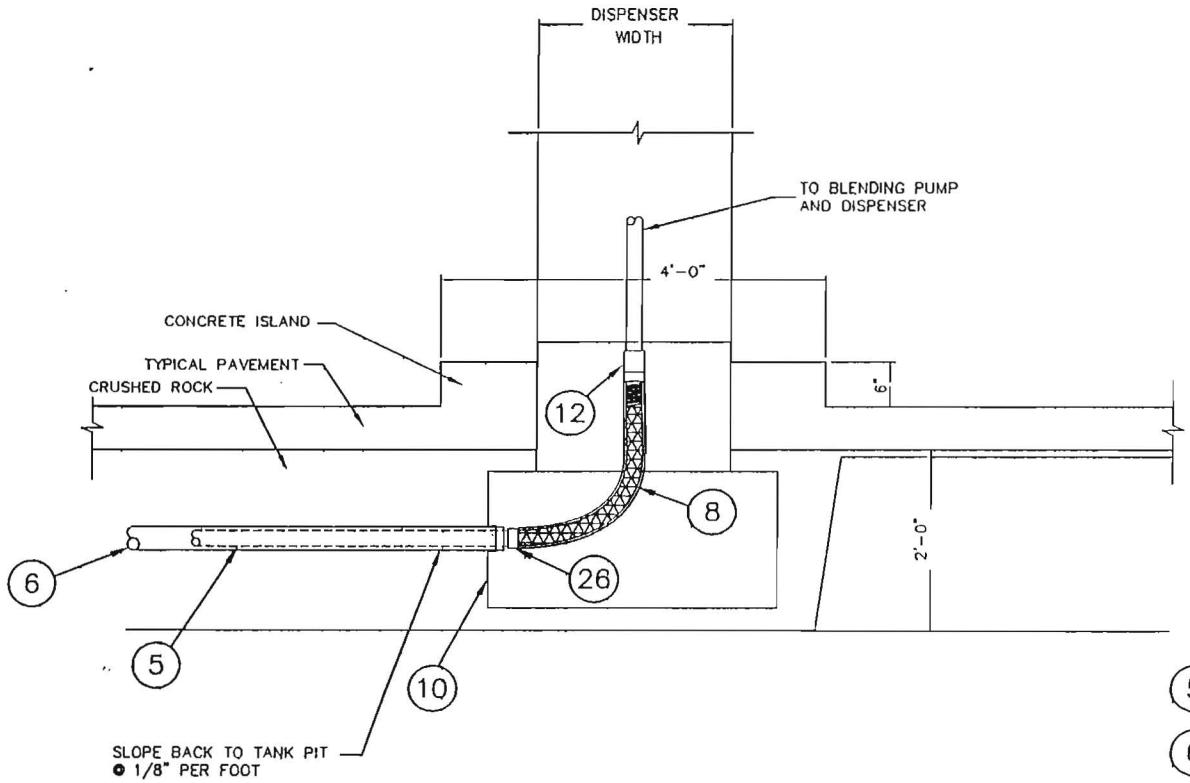


SECTION B
VAPOR RECOVERY

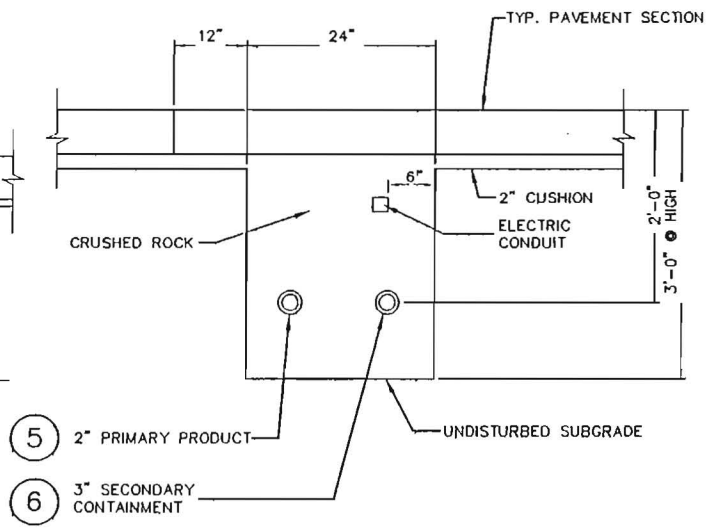
FORBES ENVIRONMENTAL ENGINEERING

TANK SECTIONS
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.24.11



DISPENSER CONNECTION



TRENCH DETAIL

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED
PROFESSIONAL ENGINEER
11/3/18

FORBES ENVIRONMENTAL ENGINEERING

DISPENSER & TRENCH DETAIL MAP
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 3.24.12

submission of a revised application, with appropriate fees.

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. All components used for this facility are U.L. listed or certified by a 3rd party and are compatible and will function pursuant to 30 TAC §213.5(d) and 30 TAC §334, Subchapter C. This **UNDERGROUND HYDROCARBON AND HAZARDOUS SUBSTANCE APPLICATION** is hereby submitted for TNRCC review. The application was prepared by:

TNRCC Registered Contractor # _____
Texas Registered P.E. Serial # 58584

Place engineer's seal here:

STEPHEN FORBES, P.E.
Print Name

Signature

11/3/98
Date

Mailing Address: 435 ISOM ROAD, SUITE 228
City, State: SAN ANTONIO, TX Zip: 78216
Telephone: (210)342-8382 Fax: (210)344-5407

29. When completed this UST system will be **owned by:**

SAC-N-PAC STORES, INC.
Company/Entity

I certify that all components used for this facility are certified by a 3rd party and are compatible and will function as required by 30 TAC §213.5(d) and 30 TAC §334, Subchapter C.

Any modification of this UST application will require TNRCC approval, prior to construction, and may require submission of a revised application, with appropriate fees.

TOM SCHOTT
Print Name of UST System Owner
(Or authorized employee)

Signature of UST System Owner
(Or authorized employee)

Date

TEMPORARY STORMWATER SECTION

FOR
REGULATED ACTIVITIES
ON THE EDWARDS AQUIFER RECHARGE ZONE
AND RELATING TO 30 TAC §213.5(b)(4), EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: SAC-N-PAC STORE #604

PROJECT DESCRIPTION

1. Geologic or manmade features identified on the project site in the geologic assessment are shown below:

#[1]	Feature Type	Relative Infiltration Rate (refer to Geologic Assessment)	Sensitivity of Feature	Temporary Pollution Abatement Measures (Design attached at the end of this form)
S-1	MM	0	POSSIBLE	PUMP HOUSE
S-2	CD	0	NONE	NONE REQUIRED

1 If there are no features present, enter NONE in this column.

POTENTIAL SOURCES OF CONTAMINATION

2. If asphalt is to be used for paving, roofing, etc. describe measures that will be taken during construction to prevent seal coat, emulsion, or other asphaltic products from washing off the project site.

____ No asphalt products will be used on this project.
__X__ Asphalt products will be used on this project. After placement of asphalt, emulsion or coatings, the applicant will be responsible for immediate clean-up should an unexpected rain occur. For the duration of the asphalt product curing time, the applicant should maintain standby personnel and equipment to contain any asphalt wash-off should an unexpected rain occur.
____ Other Measures. A narrative description is provided directly behind this page.

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

____ Aboveground storage tanks with a cumulative storage capacity of less that 250 gallons will be stored on the site for less than one (1) year. A lined earthen berm providing 150% containment is recommended for the temporary aboveground fuel storage tank.
____ 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. A lined earthen berm providing 150% containment will be provided for temporary aboveground fuel storage.
____ Aboveground storage tanks with a cumulative storage capacity

of 500 gallons or more will be stored on the site. An **Aboveground Hydrocarbon and Hazardous Substance Application** must be submitted to the appropriate Regional Office of the TNRCC prior to moving the tanks onto the project.

__X__ Fuels and hazardous substances will be provided by an off-site facilities.

4. __X__ A description of the measures that will be taken to contain any spill of hydrocarbons or hazardous substances is provided directly behind this page.

5. __X__ No temporary aboveground hydrocarbon and hazardous substance storage tank system is installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

6. __X__ Construction equipment/vehicles will be limited, where possible, to traveling within the limits of the project site. Any soil, mud, etc. carried from the project onto public roads will be cleaned up within 24 hours.

7. __X__ All soil, sand, gravel and excavated materials stockpiled on-site will have appropriately sized erosion and sedimentation controls placed downgradient.

8. __X__ Intentional release of vehicle or equipment fluids onto the ground is prohibited. Contaminated soil resulting from accidental spills will be removed and disposed of properly.

9. __X__ All waste construction material and debris will be disposed of properly at an authorized facility.

10. ____ Other potential sources of contamination. A narrative description is provided directly behind this page.

__X__ The are no other potential sources of contamination.

RESPONSE TO SECTION 4.0 ITEM 4

Precaution will be taken to avoid spillage and response plans, supplies and equipment for cleanup of accidental spills will be maintained on site by the contractor.

SITE PLAN

Items 11 through 15 must be included on the Site Plan.

11. __X__ Layout of development (Location of lots, buildings, roads, etc.) is shown and labeled.

12. Temporary pollution abatement measures for Sensitive Features:

__X__ Geologic or manmade features and temporary pollution abatement measures are shown and labeled.
____ There are no geologic or manmade features associated with this project.
____ No geologic assessment is required.

13. __X__ Stabilized Construction Exits are shown and labeled.

14. Appropriate temporary erosion and sedimentation controls are shown and labeled:

__X__ Silt fences (for drainage areas <2 acres)
____ Rock berms (for drainage areas <5 acres)
____ Sedimentation basins (drainage <100 acres)

____ Other measures. A narrative description is provided directly behind this page.

15. Measures to be taken to prevent pollution of stormwaters **originating on-site or upgradient** of the site.

__X__ Stormwater will be directed around the project site with diversion berms/channels/swales labeled on the TEMPORARY WPAP Site Plan. Approval has been obtained from the appropriate regulating authority.
____ Stormwater flow from upgradient will **flow across** the project site. A narrative description is provided directly behind this page.
____ Other measures are shown and labeled on the TEMPORARY WPAP Site Plan. A narrative description is provided directly behind this page.

ADMINISTRATIVE INFORMATION

16. __X__ All structural controls will be maintained according to the submitted and approved operation and maintenance plan for the project.

17. __X__ 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 TNRCC Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TNRCC has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

PURGATORY ROAD

STABILIZED CONSTRUCTION ENTRANCE. (SEE DETAIL)

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE

S-1

UPGRADIENT STORM WATER RUNOFF COLLECTED IN BAR DITCH EAST OF PURGATORY ROAD.

S-2

SITE BOUNDARY

JACOBS CREEK

PROPOSED COMMERCIAL BUILDING

1015

1010

ASPHALT PAVING

25' BUILDING SETBACK

1005

SILT FENCING (SEE DETAIL)

EXCAVATED MATERIAL STOCKPILE AREA WITH SILT FENCING.

PROP. INLET STRUCTURE

1000

EDGE OF PAVEMENT

SILT FENCING (SEE DETAIL)

SITE BOUNDARY

E

E

E

F.M. HIGHWAY 306

N

0 40 80

(SCALE IN FEET)

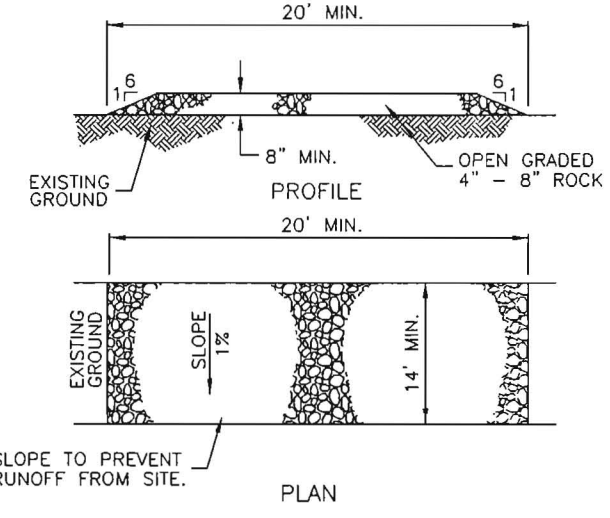
STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED PROFESSIONAL ENGINEER

11/3/98

FORBES ENVIRONMENTAL ENGINEERING, INC.

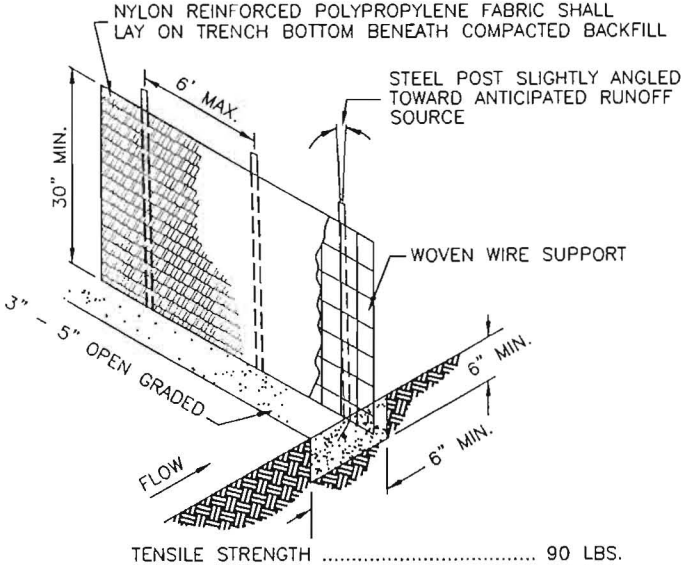
TEMPORARY STORM WATER MANAGEMENT PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 4.11.1



STABILIZED CONSTR. ENTRANCE

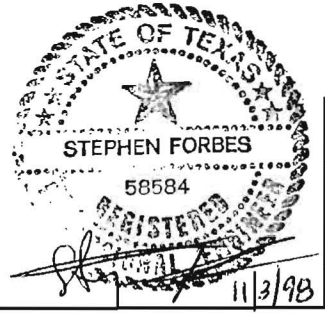
N.T.S.



TENSILE STRENGTH	90 LBS.
PUNCTURE RATING	60 LBS
MULLEN BURST RATING	280 PSI
APPARENT OPENING SIZE, U.S. SIEVE NO. 20	

SILT FENCE

N.T.S.



FORBES ENVIRONMENTAL ENGINEERING

MISCELLANEOUS DETAILS
SAC–N–PAC
COMAL COUNTY, TEXAS

FIGURE 4.11.2

18. __X__ Contractor will construct and maintain silt fences, diversion berms, and other temporary erosion and sediment controls as appropriate to prevent pollutants from entering sensitive features discovered during construction.

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 TNRCC review. The application was prepared by:

STEPHEN FORBES, P.E.
Print Name of Applicant/Engineer

STEPHEN FORBES

Signature of Applicant/Engineer

11/3/98
Date

PERMANENT STORMWATER SECTION
FOR
REGULATED ACTIVITIES
ON THE EDWARDS AQUIFER RECHARGE ZONE
AND RELATING TO 30 TAC §213.5(b)(4), EFFECTIVE DECEMBER 27, 1996

PROJECT NAME: SAC-N-PAC STORE #604

PROJECT DESCRIPTION

1. Geologic or manmade features identified on the project site in the geologic assessment are shown below:

#[1]	Feature Type	Relative Infiltration Rate (refer to Geologic Assessment)	Sensitivity of Feature	Permanent Pollution Abatement Measure[2] (Design attached at the end of this form)
S-1	MM	0	POSSIBLE	PUMP HOUSE
S-2	CD	0	NOT	NONE REQUIRED

1 If there are no features present, enter NONE in this column.
2 If the sensitivity value for a feature is indicated as "NOT", no permanent measures are required.

2. The sealing of naturally occurring sensitive features as a pollution control measure will be avoided where reasonable and practicable alternatives exist and will be evaluated by the executive director on a case-by-case basis.

_____No naturally occurring geologic features were found on the project.

POTENTIAL SOURCES OF CONTAMINATION

3. List any potential sources of contamination associated with this project after construction is complete:

1. RUNOFF DRAINAGE
2. GASOLINE AND LUBRICANTS LEAKS FROM PARKED VEHICLES
3. SPILLS FROM UNLOADING OF FUELS/FILLING OF TANKS
4. ASPHALT PARKING AREAS

FOR MULTI-FAMILY, COMMERCIAL, INDUSTRIAL DEVELOPMENTS ANSWER ITEMS 4 THROUGH 6; OTHERWISE GO TO ITEM 7.

4. Measures to be taken to prevent pollution of stormwaters **originating on-site or upgradient** of the site.

__X__ Stormwater will be directed around the project site with diversion berms/channels/swales labeled on the Permanent WPAP Site Plan. Approval has been obtained.
{Note: Existing offsite bar ditches.}

____ Stormwater flow from upgradient will flow across the project site and will be included in sizing calculations for any pollution abatement measures. A narrative description is provided directly behind this page.

__X__ Other measures are shown and labeled on the Permanent WPAP Site Plan. A narrative description is provided directly behind this page.

5. For multi-family residential, commercial, or industrial projects permanent stormwater pollution controls will be:

_____ Sedimentation/Filtration basins designed to capture the first 3/4 inch of stormwater runoff. The criteria used for design of the permanent stormwater controls is from:

____ City of Austin Environmental Criteria Manual
- ____ Full sedimentation/filtration basin system
- ____ Partial sedimentation/filtration basin system

_____ Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual
- ____ Full sedimentation/filtration basin system
- ____ Partial sedimentation/filtration basin system
- ____ Other. A detailed explanation of the design criteria is provided directly behind this page.

_____ Vegetated filter strips (Buffer Zone) designed to treat stormwater runoff. The criteria used for design of the vegetated filter strips is from:

_____ City of Austin Environmental Criteria Manual

_____ Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual

____ Other. A detailed explanation of the design criteria is provided directly behind this page.

__X__ **Alternative method.** A detailed explanation of the design criteria, including calculations showing pollutant removal rates, is provided directly behind this page. All submittals shall be signed and sealed by a registered professional engineer.

____ This is a single-family residential subdivision.

6. __X__ Scaled plans, profiles, and details are included which illustrate that the proposed treatment system is sized appropriately. Supporting calculations are shown on the plan sheet, including:
- __X__ Volume of stormwater to be treated
- __X__ Sizing of permanent pollution abatement measures.

SECTION 5.0 ITEMS 4 & 5

DESIGN CRITERIA and CALCULATIONS for RETENTION BASIN

Edward Aquifer Recharge Zone	Project Name:	SAC-N-PAC STORE #604
Water Pollution Abatement Plan	Location:	Comal County, Texas
Permanent Storm Water Section	Designed by:	Stephen Forbes, P.E.
	Date:	November 3, 1998

For: Retention Basin with Irrigation

Reference Method: Lower Colorado River Authority Lake Travis Nonpoint Source Pollution Control Ordinance Technical Manual (Effective Date February 1, 1990, amended August 12,1992) {Referred to as LCRA Technical Manual}

{Note: Section 4.2.8(in regard to Retention Basin) from LCRA Technical Manual attached.}

Project: Construction of new facilities including convenience store and installation of new UST System, and support systems including, retention basin, dedicated irrigation area, and septic system.

Step 1 - % Impervious Cover of the Project Site

Project Site: Use 1.7 acres (See Project Detailed Site Map Section 3.0 Figure 3.2) .

Total Impervious Cover:	Structures/rooftops:	5,968 square feet	0.14 acres
	Paved surfaces:	18,421 square feet	0.42 acres
	Total	24,389 square feet	0.56 acres

$$\frac{\text{Total Impervious Cover(acres)}}{\text{Total Project Site Acreage}} \times 100 = \% \text{ Total impervious cover for project site}$$

$$\% \text{ Total impervious cover: } \frac{0.56 \text{ acres}}{1.75 \text{ acres}} \times 100 = 32\%$$

Step 2 - Identify Target Reduction Level
(Source: LCRA Technical Manual)

Given Performance Standards Based on Slope of Site				
Location of Site	Slope of Property	Required Reduction Level of Indicator Pollutant		
		TSS	TP	O&G
More than 500 feet from notable recharge features	under 10%	70%	70%	70%
	10% -20%	80%	75%	75%
	over 20%	90%	85%	85%
Less than 500 feet from notable recharge features	under 10%	75%	75%	75%
	10% - 20%	90%	85%	85%
	over 20%	90%	85%	85%

Since slopes across the project site are under 10% and significant recharge features are located within 500 feet of the project site, a target reduction level of 75% for all three indicator pollutants is selected.

Step 3 - Select a Capture Volume
(Source:LCRA Technical Manual)

Removal Efficiencies Percent of Indicator Pollutants										
Capture Volume (inches)	% Impervious Cover of Project Site									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
0.50	78	75	70	66	61	57	54	51	48	46
0.75	79	78	75	72	69	66	63	61	58	56
1.00	80	79	78	76	74	71	69	67	65	62
1.50	80	79	79	78	77	76	75	73	72	70
2.00	80	80	79	79	79	78	77	76	75	74

Using the 30% of impervious cover from Step 1 and the 75% reduction levels from Step 2 the capture volume to use for the retention basin design is 0.75 inch.

Step 4 - Size of Retention Basin

a) Capture volume =0.75 inch = 0.0625 feet — See Step 4
b) Capture area = 24,389 square feet — See Step 1

24,389 square feet x 0.0625 feet = 1,524 cubic feet of storage capacity
use 1,800 cubic feet
1,800 cubic feet x 7.48 gal/cu.ft = 13,464 gallons

{Note: total safety factor = 15% not counting safety factor introduced by tables}

Step 5 - Irrigation Area Requirements

LCRA Technical Manual irrigation operating parameters:

Application rate	Maximum 0.1 inches per hour
Irrigation cycle	Maximum 12 hours per day
Collected volume to be removed	within 72 hours after rainfall event

a) Daily application rate:

12 hours/day x 0.1 inch/hour = 1.2 inches/day

b) Total application depth within 72 hours:

1.2 inches/day x 3.0 days = 3.6 inches of application allowed over irrigation area
= 0.3 feet

Total Application Time = 12 hours per day x 3 days= 36 hours

c) Total application area:

$$\text{Area} = \frac{\text{Retention Basin Storage Capacity}(ft^3)}{\text{Total Application Depth}(ft)}$$

$$\text{Required Irrigation Area} = \frac{1{,}800\ ft^3}{0.3\ ft} = 6{,}000\ ft^2$$

Step 6 Discharge Rate

Retention Basin Storage Capacity: 13,464 gallons — See Step 4
Total Application Time: 36 hours — See Step 5b

$$\text{Discharge Rate} = \frac{13{,}464 \text{ gallons}}{36 \text{ hours}} = 374 \text{ gph or } 6.2 \text{ gpm}$$

Step 7 Final Design

Final Retention basin design criteria(see attached detail):

- Capture volume — 0.75 inch
- Capacity — 1,800 cu. ft. = 13,464 gals.
- Water Surface Elevation — 1,006 feet msl
- Bottom elevation — 1,004 feet msl
  - ◊ Freeboard — 1,007 feet msl(1 foot)
  - ◊ Side Slopes — 3:1
- Bypass — greater than 13,464 gallons
  - ◊ Line pipe soffit elevation — 1,006 feet msl (invert at 1,005.33 ft msl)
  - ◊ Branch pipe invert elevation — 1,006 feet msl
- Drain pipe to basin — 8"
  - ◊ max. hrly intensity 100 yr storm — i = 4" per hour
  - ◊ drainage area — A= 6,000 square foot
  - ◊ surface coefficient — C= .95
  - ◊ Drainage area discharge Q=CiA

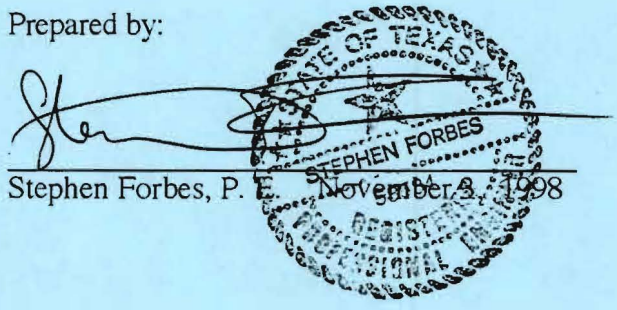
Q= .95(.33 fph)(6,000 sq.ft)= 1,900 cf/hr = 0.53 cfs or 237 gpm

(6" or 8" sufficient; use 8" pipe Sch. 40 PVC for worse case scenario)

Irrigation System:

- Basin to be emptied within 72 hours after rainfall event
- Application rate 0.1 inch per hour
- Irrigation area requirements: 6,000 square feet
- Maximum discharge rate : 6.2 gpm at 40 ft head
- 1 gpm per sprinkler head; 6 sprinkler heads @ 1 gal. ea.
- 1/2 hp submersible pump, 115v

Prepared by:



Stephen Forbes, P. E. November 3, 1998

OPERATION AND MAINTENANCE PROCEDURES

7. _X_ The maintenance plan and schedule for each permanent pollution abatement structure or measure is provided directly behind this page.

STREAM CONTAMINATION AND/OR EROSION

8. If construction of the project will increase flashing, create stronger flow and stream velocity, or otherwise increase instream erosion and the degradation of water quality, measures to avoid or minimize the surface stream contamination or changes in the way that stormwater enters the stream must be taken.

_X_ The project will not increase the peak of the downgradient instream stormwater hydrograph or the downgradient velocity of the stream.

____ The project will increase the peak of the downgradient instream stormwater hydrograph and/or the downgradient velocity of the stream. A description of the measures to avoid or minimize the effects of the regulated activity on the downgradient stream is provided directly behind this page.

SITE PLAN
Items 9 through 15 must be included on the Site Plan.

9. _X_ Layout of development (Location of lots, buildings, roads, etc.) is shown and labeled.

10. _X_ Geologic or manmade features are shown and labeled.
____ There are no geologic or manmade features associated with this project.

11. ____ Vegetated filter areas are shown and labeled.
_X_ There are no vegetated filter areas associated with this project.

12. ____ Sedimentation/filtration basins are shown and labeled.
_X_ There are no sedimentation/filtration basins associated with this project.

13. ____ Berms, channels, etc. showing velocity controls are shown and labeled.
_X_ There are no berms, channels, etc. associated with this project. **{There are existing offsite bar ditches.}**

14. _X_ Areas of concentrated runoff with appropriately sized energy dissipators at each outfall are shown and labeled.
____ There are no areas of concentrated runoff (channels, culverts, drainage pipe discharges, etc.) associated with this project.

PURGATORY ROAD

SITE BOUNDARY

10' UTILITY EASEMENT

25' BUILDING SETBACK

WELL HOUSE

S-1

UPGRADIENT STORM WATER RUNOFF COLLECTED IN BAR DITCH EAST OF PURGATORY ROAD.

S-2

SITE BOUNDARY

PROPOSED COMMERCIAL BUILDING

ASPHALT PAVING

25' BUILDING SETBACK

1005

1009

1010

1011

1012

1013

1014

1015

1000

1002

1007

PROP. INLET STRUCTURE

EDGE OF PAVEMENT

PROPOSED RETENTION BASIN
(1,800 CU. FT. CAPACITY)

RETENTION BASIN IRRIGATION AREA

SITE BOUNDARY

E

E

E

F.M. HIGHWAY 306

N

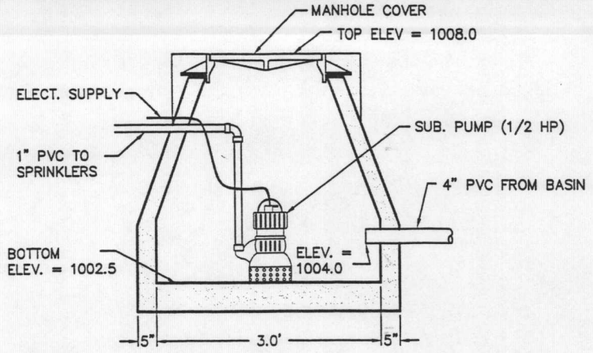
0 40 80
(SCALE IN FEET)

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED PROFESSIONAL ENGINEER
11/3/98

FORBES ENVIRONMENTAL ENGINEERING

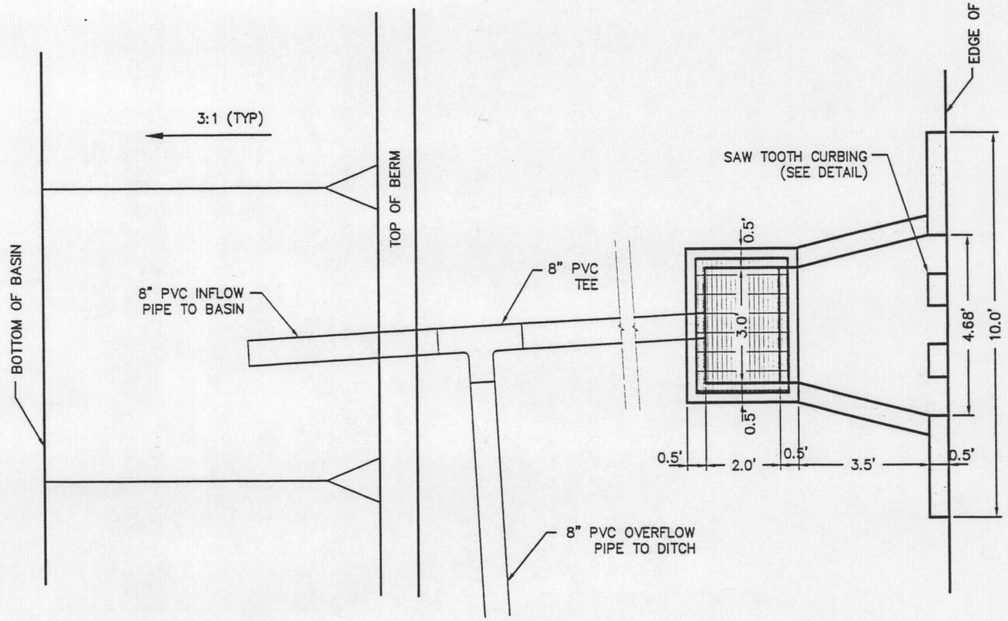
PERMANENT STORM WATER MANAGEMENT PLAN
SAC-N-PAC
COMAL COUNTY, TEXAS

FIGURE 5.9.1



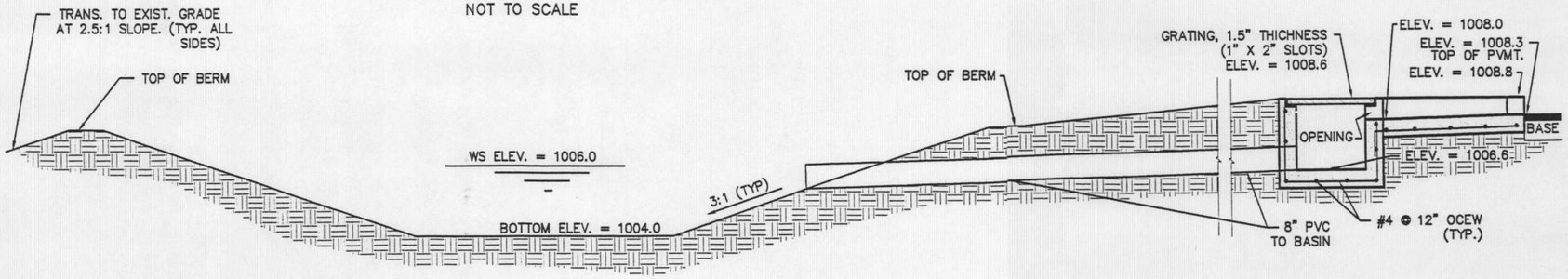
STD. MANHOLE WITH SUB. PUMP

NOT TO SCALE



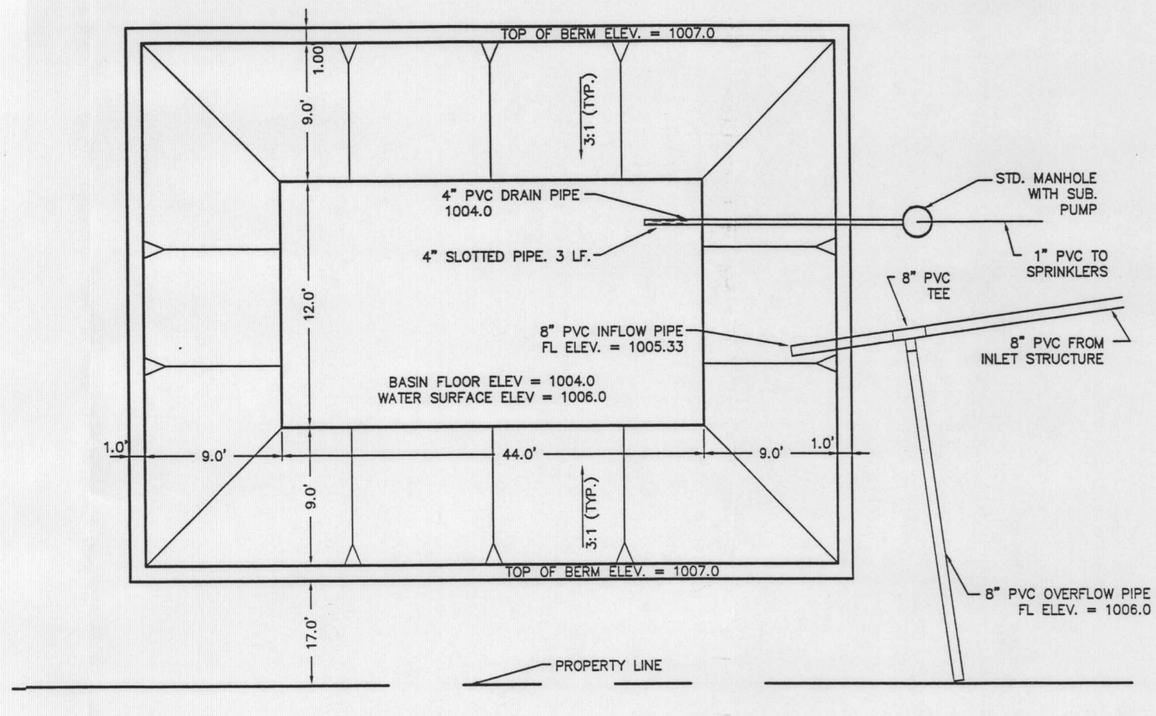
PLAN VIEW
INLET STRUCTURE TO BASIN

NOT TO SCALE



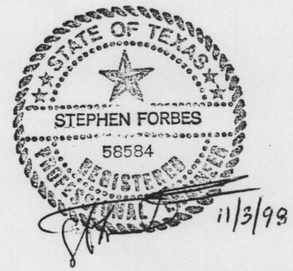
SECTION
INLET STRUCTURE TO BASIN

NOT TO SCALE



RETENTION BASIN PLAN

1" = 10'



FORBES ENVIRONMENTAL ENGINEERING

RETENTION BASIN
SAC–N–PAC
COMAL COUNTY, TEXAS

FIGURE **5.9.2**

RESPONSE TO SECTION 5.0, ITEM 7

OPERATION & MAINTENANCE PLAN

RETENTION BASIN:

Monthly: The vegetated growth in the retention basin will be checked monthly, and if necessary, mowed or otherwise controlled to prevent growth from exceeding 12" in height.

Pump will be checked at least monthly for proper operation.

Quarterly: Silt depth will be checked every three months. If depth of silt exceeds 6", it will be removed and redeposited of onsite over the vegetated area.

The basin will be checked for the accumulation of trash or debris and removed.

After Rainfall: The basin should be checked after each storm event exceeding 1" for excessive accumulation of silt. Silt accumulations above 6" shall be removed from the basin.

Sediment which accumulates in front of the energy dissipater (saw tooth curb) at the inlet structure to the retention basin will be removed following each significant storm event. This material will be redeposited across the vegetated areas.

VEGETATED IRRIGATION AREA

1. The vegetated irrigation area will be maintained with uniform slopes to encourage sheet flow, even distribution and percolation of irrigated area. Areas of channeled flows will be filled, leveled, and a vegetative cover established.

2. A healthy vegetative cover will be maintained. The vegetation will be mowed as needed to keep grass height below 6" and to prevent the establishment of woody perennial species.

IRRIGATION SYSTEM

1. The operator will ensure that the system, including switches, valves, sprinkler heads, pump, and other components are regularly inspected (no less than once per month) to unsure proper working condition.

2. During operation of the irrigation system, the operator will ensure that the system is applying appropriate volumes of stormwater at no greater than 0.1 inch per hour. The design irrigation schedule is to empty the pond within 72 hours after a rainfall event irrigating for 12 hours per day at a rate of no greater than 6 gpm. If the system is not operating within these parameters, adjustments to or modification of the system shall be performed.

15. __X__ Other pollution abatement measures are shown and labeled. A narrative description is provided directly behind this page. (SEE ITEM 4 & 5)

ADMINISTRATIVE INFORMATION

16. __X__ All structural controls will be maintained according to the submitted and approved operation and maintenance plan for the project.

17. __X__ 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 TNRCC Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TNRCC has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

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 TNRCC review. The application was prepared by:

STEPHEN FORBES, P.E
Print Name of Applicant/Engineer

STEPHEN FORBES 58[illegible]

Signature of Applicant/Engineer

11/3/98
Date

AGENT AUTHORIZATION FORM
FOR SUBMITTAL OF
EDWARDS AQUIFER PROTECTION PLANS
FOR REGULATED ACTIVITIES ON THE
EDWARDS AQUIFER RECHARGE/TRANSITION ZONES
AND RELATING TO 30 TAC §213.4(d), EFFECTIVE DECEMBER 27, 1996

I Janelle Warren
Print Name

Owner
Title - Owner/President/Other

of SAC-N-PAC STORES, INC.
Corporation/Partnership/Entity Name

have authorized STEPHEN FORBES, P.E.
Print Name of Agent/Engineer

of FORBES ENVIRONMENTAL ENGINEERING, INC.
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 Edwards Aquifer Protection Plan application to the Texas Natural Resource Conservation Commission (TNRCC) for the review and approval consideration for construction of regulated activities on the Edwards Aquifer Recharge Zone or Transition Zone (30 TAC §213.4(d)).

I also understand that:

1. No regulated activity is allowed to commence prior to the executive director's approval of the Edwards Aquifer protection plan. If unauthorized construction begins before the approval is granted or if any aspect of the project does not conform to 30 Texas Administrative Code §213 and any condition of the TNRCC's approval letter, the TNRCC is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. Before beginning any construction related to the approved regulated activity, the appropriate TNRCC regional office must be given 24 to 48 hour written notice of the date when the regulated activity will commence.

3. **A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and the forms must accompany the completed submittal.**

4. Application fees accompanied by an Edwards Aquifer Application Fee Form are due and payable at the time the application is submitted. The application fee must be sent to the Revenues Section of the TNRCC or to the appropriate regional office. **The application will not be considered until the correct fee is received by the commission.**

Janelle Warren
Applicant's Signature

11-4-98
Date

THE STATE OF TEXAS §

County of Hays §

BEFORE ME, the undersigned authority, on this day personally appeared JANELLE WARREN 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 4th day of November 1998.

Lori E. Glover

Signatories to Applications 30 TAC §213.4(d)

(1) Required Signature. All applications must be signed as follows.

(A) For a corporation, a principal executive officer (president, vice-president, or a duly authorized representative) must sign the application. A representative must submit written proof of the authorization.

(B) For a partnership, a general partner must sign the application;

(C) For a political entity such as a municipality, state, federal or other public agency, either a principal executive officer or a duly authorized representative must sign the application. A representative must submit written proof of the authorization.

(D) For an individual or sole proprietorship, the individual or sole proprietor must sign the application.

(2) Proof of Authorization to Sign. The executive director requires written proof of authorization for any person signing an application.

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

EDWARDS AQUIFER PROTECTION PROGRAM

APPLICATION FEE FORM

NAME OF PROPOSED PROJECT: SAC-N-PAC STATE HIGHEAY 306 & PURGATORY ROAD

PROJECT LOCATION: INTERSECTION OF STATE HIGHWAY 306 & PURGATORY ROAD, NEW BRAUNFELS, TEXAS.

NAME OF OWNER/DEVELOPER: MR. WARNER GARLAND

OWNER'S ADDRESS: 1405 UNITED DRIVE, SUTIE 115, SAN MARCUS, TEXAS 78666

CONTACT PERSON: MR. TOM SCHOTT PHONE: (512)392-6494

Please Print

AUSTIN REGIONAL OFFICE

- ☐ Hays
- ☐ Travis
- ☐ Williamson

SAN ANTONIO REGIONAL OFFICE

- ☐ Bexar
- ☒ Comal
- ☐ Kinney
- ☐ Medina
- ☐ Uvalde

APPLICATION FEES MUST BE PAID BY CHECK, CERTIFIED CHECK, OR MONEY ORDER, PAYABLE TO THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION. YOUR CANCELED CHECK WILL SERVE AS YOUR RECEIPT. **TO ENSURE CREDIT TO THE PROPER ACCOUNT PLEASE RETURN THIS FORM WITH YOUR FEE PAYMENT. THIS PAYMENT IS BEING SUBMITTED TO (CHECK ONE):**

☒ **SAN ANTONIO REGIONAL OFFICE**

☐ Mailed to TNRCC:
TNRCC - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ **AUSTIN REGIONAL OFFICE**

☐ Overnight Delivery to TNRCC:
TNRCC - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
512/239-0347

Type of Application	Size	Fee Due		
		New (3373)	Modification (3374)	
WPAP	1.7 Acres	$ 3,000	$	PAP
SCS	L.F.	$	$	SCS
Lift Stations without sewer lines	Acres	$	$	
UST/AST	2 Tanks	$ 1,000	$	HHS
Piping System(s) (Installed without tanks)	Each	$	$	PSM
Extension of Time	Each	$	$	EXT

Signature

STATE OF TEXAS
STEPHEN FORBES
58784

11/3/98
Date

TNRCC-0574 (2/4/97)