Bryan W. Shaw, Ph.D., *Chairman*
Buddy Garcia, *Commissioner*
Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 22, 2010

Mr. Glendon Eppler
New Braunfels Church of Christ
1665 Business Loop 35 South
New Braunfels, TX 78130

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ, located at 1665 Business Loop 35 South, New Braunfels, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2377.03, Investigation No. 781293
Regulated Entity No. RN104726906

Dear Mr. Eppler:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP Application for the above-referenced project submitted to the San Antonio Regional Office by The Schultz Group, Inc. on behalf of the New Braunfels Church of Christ on October 22, 2009. Final review of the WPAP was completed after additional material was received on December 30, 2009, January 7, 2010, and January 21, 2010. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

BACKGROUND

A WPAP application was submitted to the TCEQ San Antonio Regional Office on July 25, 2005. It was approved by letter dated July 18, 2006. Because regulated activities did not commence within two years of the approval, the plan expired.

PROJECT DESCRIPTION

The project site is about 11.58 acres. Regulated activities will include the construction of church buildings, driveways, parking areas, sidewalks, a sand filter basin to treat stormwater, and a separate stormwater detention pond. The impervious cover will be about 6.70 acres (58 percent). Project

wastewater will be disposed of by conveyance to the existing Gruene Road Wastewater Treatment Plant owned by New Braunfels Utilities.

PERMANENT POLLUTION ABATEMENT MEASURES

To mitigate pollution contained in stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, a partial sedimentation/filtration basin, designed using the TCEQ technical guidance document, *Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices* (2005), will be constructed to treat stormwater runoff. The basin will be sized to capture the first 1.60 inches of stormwater run-off from 6.60 acres of impervious cover within a 9.73 acre catchment area. It has been oversized to accommodate for 0.10 acre of impervious cover that will not be captured and treated by the basin. The basin will provide a total capture volume of 38,259 cubic feet (37,087 cubic feet required) to treat 6,014 pounds of total suspended solids. The sand filtration system will consist of 2,980 square feet of sand (2,949 square feet required), 18 inches thick, with underdrain piping surrounded by gravel. Sand and gravel layers will be separated with filter fabric and contained above concrete. The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

GEOLOGY

According to the geologic assessment included with the application, the site is situated on the cyclic and marine member and the leached and collapsed member of the Person Formation, Edwards Group. Clayey and cherty Rumple-Comfort association soils were identified and shown to be 0.5 to 2 feet thick at the site. The San Antonio Regional Office did not conduct a site assessment.

One sensitive feature, Feature S-10, was noted at the site. It is a former public water supply well, TWDB Well No. 6823317, and is located near the northern corner of the site. The well was reportedly purchased by New Braunfels Utilities in 1998. It is to be plugged and abandoned (if and when required) in accordance with applicable rules. A 6-inch stand up concrete curb is to be constructed around the well.

SPECIAL CONDITIONS

I. All permanent pollution abatement measures shall be operational prior to occupancy of the facility.

II. All sediment and/or media removed from the water quality basin during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.

2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the approved plan. Additional and separate approvals, permits, registrations and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, UIC) can be required depending on the specifics of the plan.

3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. Within 60 days of receiving written approval of an Edwards Aquifer Protection Plan, the applicant must submit to the San Antonio Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.

5. All contractors conducting regulated activities at the referenced 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. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.

7. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

8. 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 TCEQ 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.

9. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

During Construction:

10. During the course of regulated activities related to this project, the applicant or 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.

11. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during

construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 6, above.

12. If any sensitive feature (caves, solution cavities, sink holes, etc.) 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 potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

13. One well exists on the site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

14. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

15. Intentional discharges of sediment laden storm water are not allowed. If dewatering becomes necessary, the discharge will be filtered through appropriately selected best management practices. These may include vegetated filter strips, sediment traps, rock berms, silt fence rings, etc.

16. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

17. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction aetivities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

<u>After Completion of Construction</u>:

18. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the San Antonio Regional Office within 30 days of site completion.

19. The applicant shall be responsible for maintaining the permanent BMPs after construetion until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through the San Antonio

Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

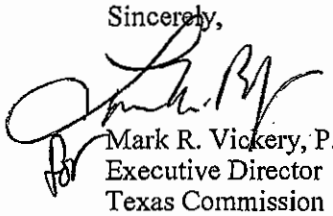
20. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

21. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

22. 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.

If you have any questions or require additional information, please contact Alan G. Jones of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4074.

Sincerely,



Mark R. Vickery, P.G.
Executive Director
Texas Commission on Environmental Quality

MRV/AGJ/eg

Enclosures: Deed Recordation Affidavit, Form TCEQ-0625
Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

cc: Mr. Michael G. Short, P.E., The Schultz Group, Inc.
Mr. James C. Klein, P.E., City Engineer, City of New Braunfels
Mr. Tom Hornseth, P.E., Comal County
Ms. Velma Reyes Danielson, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

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Protecting Texas by Reducing and Preventing Pollution

January 22, 2010

Mr. Glendon Eppler
New Braunfels Church of Christ
1665 Business Loop 35 South
New Braunfels, TX 78130

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Edwards Aquifer Protection Program ID No. 2377.03, Investigation No. 781293
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During Construction:

10. During the course of regulated activities related to this project, the applicant or 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.

11. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during

construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment. Refer to Standard Condition No. 6, above.

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After Completion of Construction:

18. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the San Antonio Regional Office within 30 days of site completion.

19. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through the San Antonio

Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.

20. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

21. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

22. 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.

If you have any questions or require additional information, please contact Alan G. Jones of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4074.

Sincerely,

Mark R. Vickery, P.G.
Executive Director
Texas Commission on Environmental Quality

MRV/AGJ/eg

Enclosures: Deed Recordation Affidavit, Form TCEQ-0625
Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

cc: Mr. Michael G. Short, P.E., The Schultz Group, Inc.
Mr. James C. Klein, P.E., City Engineer, City of New Braunfels
Mr. Tom Hornseth, P.E., Comal County
Ms. Velma Reyes Danielson, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC 212

Comal Co

THE Schultz Group INC.

P.O. BOX 310483 • NEW BRAUNFELS, TX 78131-0483 • Phone: (830) 606-3913 • Fax: (830) 625-2204

RECEIVED
JAN 26 2010
COUNTY ENGINEER

January 21, 2010

Mr. Allen Jones
Field Operation Division/San Antonio Region
Texas Commission of Environmental Quality
14250 Judson Rd.
San Antonio, TX 78233-4480

RECEIVED TCEQ
SAN ANTONIO
REGION
2010 JAN 21 PM 3:32

Re: Edwards Aquifer Protection Program, Comal County
TYPE OF PLAN: Water Pollution Abatement Plan
NAME OF PROJECT: New Braunfels Church of Christ

Allen Jones:

On January 20, 2010 The Schultz Group, Inc. received an Administrative Deficiency Notice from your office. To the best of our knowledge we have corrected all deficiencies in the following manner:

Responses to Deficiencies

1. Attachment C –BMPs for Onsite Stormwater was revised to reflect the changes in impervious cover within the catchment area, pond area, and pond volume.

2. Attachment D- BMPs for Surface Streams was revised to reflect the changes in impervious cover within the catchment area, pond area, and pond volume.

3. Plan Sheet P-1 was revised to reflect the changes in the sand filter and sedimentation areas. The sizing calculations were also revised to reflect comments from the TCEQ. The revisions to Plans Sheet P-1 are as follows:

   a. The rock filter has been moved 1' to get the required 2,949 SF of filter basin area.
   b. The pipe under drains have been moved over 1' to keep the separation distance from the wall less than 5'.

4. The total water quality volume for the pond has been more accurately calculated to include volume above the access ramp. (See Attached)

5. The sedimentation calculations have been revised to reflect comments from TCEQ.

If the TCEQ has any questions or requires additional information please don't hesitate to contact us.

Thank you,

Shawn Schorn, E.I.T.
Engineer in Training
The Schultz Group, Inc.
Phone: (830) 606-3913
Fax: (830) 625-2204

STATE OF TEXAS
MICHAEL G. SHORT
88015
LICENSED
PROFESSIONAL ENGINEER

Thank you,

11/1/10

Mike Short, P.E.
Senior Design Engineer
The Schultz Group, Inc.
Phone: (830) 606-3913
Fax: (830) 625-2204

Canal Co.

"RECEIVED TCEQ"
SAN ANTONIO
REGION
2010 JAN 21 PM 3:32

RECEIVED
JAN 26 2010
COUNTY ENGINEER

NEW BRAUNFELS CHURCH OF CHRIST WATER POLLUTION ABATEMENT PLAN ADDENDUM #2

January 2010

Prepared for:

New Braunfels Church of Christ
1665 Business Loop 35 South
New Braunfels, TX 78130

Project No. 060109

Prepared By:

The Schultz Group Inc.
2461 Loop 337
New Braunfels, TX 78130
(830) 606-3913

Attachment C – Project Description

It is proposed that the New Braunfels Church of Christ be an 11.58 acre developed constructed in two phases.

Phase 1 will consist of 2.49 acres of parking, 0.17 acres of miscellaneous concrete, 0.63 acres of rooftops and building square footage, and 0.20 acres of concrete sidewalks. The parking lot will include minimal landscaping islands and buffer areas. The parking lot will be graded to drain all onsite flows to a proposed sand filter system and detention pond. The sand filter system and detention pond will be constructed as part of Phase 1 and will be adequately sized to handle flows for Phase 1 and Phase 2.

Phase 2 will include expansions of all facilities. Proposed impervious cover for both Phase 1 and Phase 2 will consist of 5.03 acres of parking, 0.18 acres of miscellaneous concrete, 1.25 acres of rooftops and building square footage, and 0.28 acres of concrete sidewalks. All expansions will be graded to the sedimentation and detention pond constructed in Phase 1.

Summary of project areas are as follows:

Phase 1

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	27,458	÷ 43,560 =	0.63
Parking	108,420	÷ 43,560 =	2.49
Other paved surfaces	16,173	÷ 43,560 =	0.37
Total Impervious Cover	152,051	÷ 43,560 =	3.49
Total Impervious Cover ÷ Total Acreage x 100 =			30.14%

Phase 2

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	54,552	÷ 43,560 =	1.25
Parking	219,278	÷ 43,560 =	5.03
Other paved surfaces	20,255	÷ 43,560 =	0.46
Total Impervious Cover	294,085	÷ 43,560 =	6.74
Total Impervious Cover ÷ Total Acreage x 100 =			58.20%

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

REGULATED ENTITY NAME: New Braunfels Church of Christ

REGULATED ENTITY INFORMATION

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

2. Total site acreage (size of property): 11.58

3. Projected population: 1 Church/Approximately 71 EDU's

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

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	54,552	÷ 43,560 =	1.25
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Total Impervious Cover	294,085	÷ 43,560 =	6.74
Total Impervious Cover ÷ Total Acreage x 100 =			58.20%

5. X **ATTACHMENT A - Factors Affecting Water Quality.** A description of any factors that could affect surface water and groundwater quality is provided at the end of this form.

6. X Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

FOR ROAD PROJECTS ONLY N/A
Complete questions 7-12 if this application is exclusively for a road project.

7. Type of project:
   ___ TXDOT road project.
   ___ County road or roads built to county specifications.
   ___ City thoroughfare or roads to be dedicated to a municipality.
   ___ Street or road providing access to private driveways.

8. Type of pavement or road surface to be used:
   ___ Concrete
   ___ Asphaltic concrete pavement
   ___ Other: _____

Attachment C – BMPs for Onsite Stormwater

The Best Management Practice used as the permanent control device for The New Braunfels Church of Christ Phase 1 and Phase 2 will be a Sand Filter System. The Sand Filter System has been designed to mitigate all impervious cover onsite and the impervious cover located within the drainage located immediately upstream of our site.

The impervious cover located onsite has been graded to drain away from the well located onsite. The onsite well has not been plugged and capped in accordance with 16 TAC Ch. 76. The future of the well is unknown at this time; however it will be protected from runoff via 6" stand up curb.

A partial sedimentation/filtration basin is sized to capture the first 1.60 inches of stormwater run-off from 6.60 acres of impervious cover within a 9.73 acre catchment area, providing a total capture volume of 38,259 cubic feet where only 37,087 cubic feet is needed to treat 6,014 pounds of total suspended solids. A sand filtration system will consist of 2,980 square feet of sand, 18 inches thick, with under drain piping surrounded by gravel. Sand and gravel layers will be separated with filter fabric and contained above an impermeable concrete liner. 0.10 acres of new impervious cover common to drive draining to Alyssa Way in Drainage area F4 will not be captured for treatment and will be accounted for by overtreatment by the sand filter system.

The sand filter system has been designed to treat the first 1.60 inches of stormwater runoff. The first 1.60 inches of stormwater will flow through the splitter and into the sand filter system via a 3.79" x 1.50" opening. The remainder of stormwater runoff will then flow into the detention pond. The detention pond has been designed to mitigate increases in storm water runoff as a result of the increase in impervious cover. The detention pond has been designed in accordance with the City of New Braunfels Drainage and Erosion Control Design Manual (September 2000). The sand filter system has been designed in accordance with the TCEQ's Complying with Edwards Aquifer Rules Technical Guidance on Best Management Practices (July 2005).

Attachment D – BMPs for Surface Streams

The Best Management Practice used as the permanent control device for The New Braunfels Church of Christ Phase 1 and Phase 2 will be a Sand Filter System. The Sand Filter System has been designed to mitigate all proposed impervious cover onsite. The Sand Filter System will adequately protect the adjacent tributary to Bleider's Creek.

A partial sedimentation/filtration basin is sized to capture the first 1.60 inches of stormwater run-off from 6.60 acres of impervious cover within a 9.73 acre catchment area, providing a total capture volume of 38,259 cubic feet where only 37,087 cubic feet is needed to treat 6,014 pounds of total suspended solids. A sand filtration system will consist of 2,980 square feet of sand, 18 inches thick, with under drain piping surrounded by gravel. Sand and gravel layers will be separated with filter fabric and contained above an impermeable concrete liner. 0.10 acres of new impervious cover common to drive draining to Alyssa Way in Drainage area F4 will not be captured for treatment and will be accounted for by overtreatment by the sand filter system.

The impervious cover located onsite has been graded to drain away from the well located onsite. The onsite well has not been plugged and capped in accordance with 16 TAC Ch. 76. The future of the well is unknown at this time; however it will be protected from runoff via 6" stand up curb.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Proposed Conditions Phase II
Date Prepared: 12/21/2009

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

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

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

where:

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

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

County =	Comal	
Total project area included in plan * =	11.58	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	6.70	acres
Total post-development impervious cover fraction * =	**0.58**	
P =	**33**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**6014**	lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = 4

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	9.73	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	6.60	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.68**	
$L_{M\ THIS\ BASIN}$ =	**5924**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
Removal efficiency = **89** percent

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



RG-348 Page 3-33 Equation 3.7. L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

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

A_C =	8.40	acres
A_I =	6.60	acres
A_P =	**1.80**	acres
L_R =	**6735**	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	6014	lbs.
F =	**0.89**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.60**	inches
Post Development Runoff Coefficient =	**0.6046**	
On-site Water Quality Volume =	**29495**	cubic feet

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

Off-site area draining to BMP =	1.33	acres
Off-site Impervious cover draining to BMP =	0.23	acres
Impervious fraction of off-site area =	**0.17**	
Off-site Runoff Coefficient =	**0.1827**	
Off-site Water Quality Volume =	**1411**	cubic feet
Storage for Sediment =	**6181**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**37087**	cubic feet

9. Filter area for Sand Filters Designed as Required in RG-348 Pages 3-58 to 3-63

9B. Partial Sedimentation and Filtration System

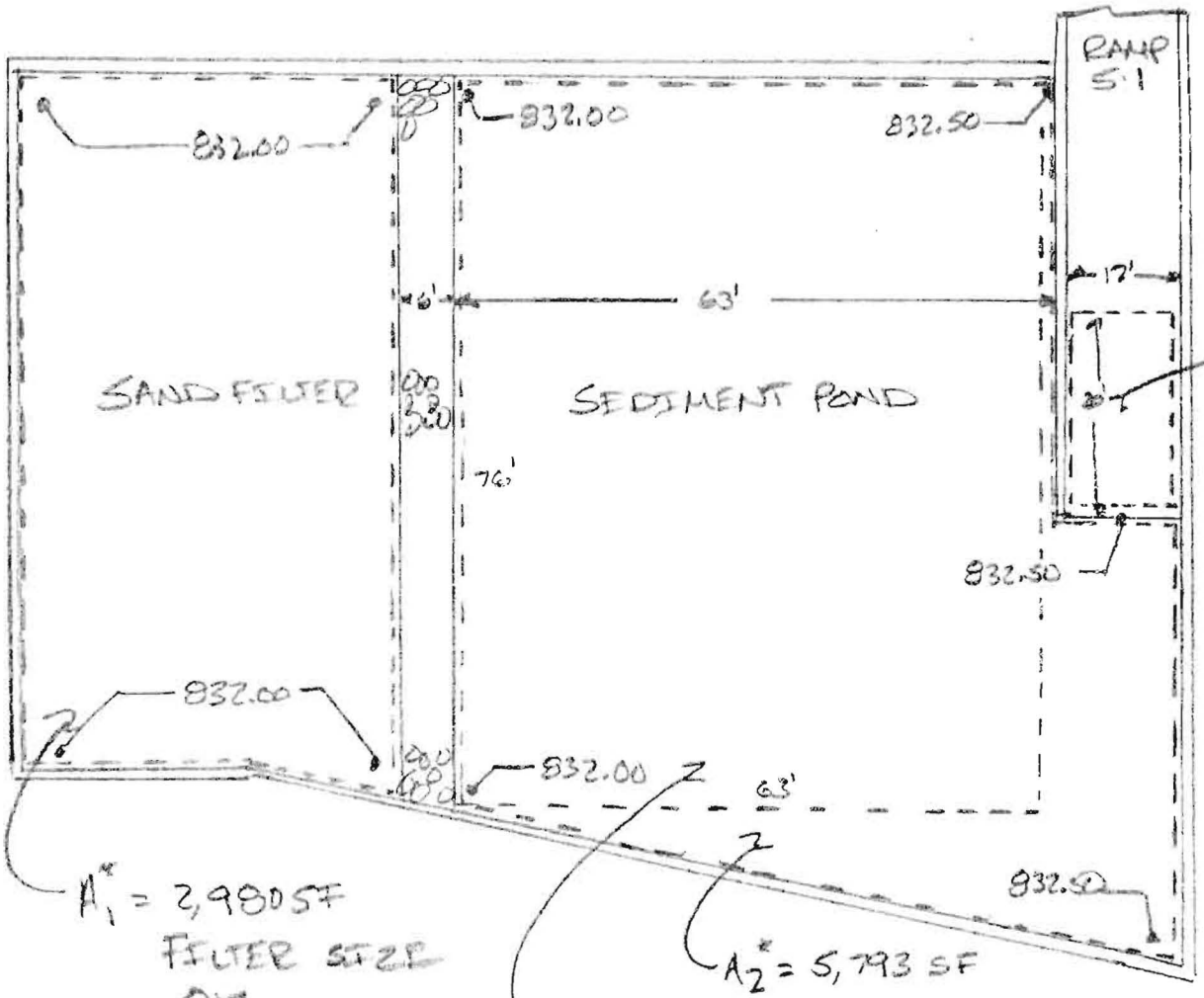
Water Quality Volume for combined basins =	**37087**	cubic feet
Minimum filter basin area =	**2949**	square feet
Maximum sedimentation basin area =	**11798**	square feet For minimum water depth of 2 feet
Minimum sedimentation basin area =	**737**	square feet For maximum water depth of 8 feet

CHURCH OF CHRIST

WQP VOLUME CALCULATIONS

NO 11/2010

3 OF 3



SAND FILTER => V_1 = 2,980 * (836.50 - 832.00) = 13,410 CF

SEDIMENT POND ABOVE 832.50 => V_2 = 5,793 * (836.50 - 832.50) = 23,172 CF

ABOVE RAMP => V_3 = 240 * 1/2 (836.50 - 832.50) = 480 CF

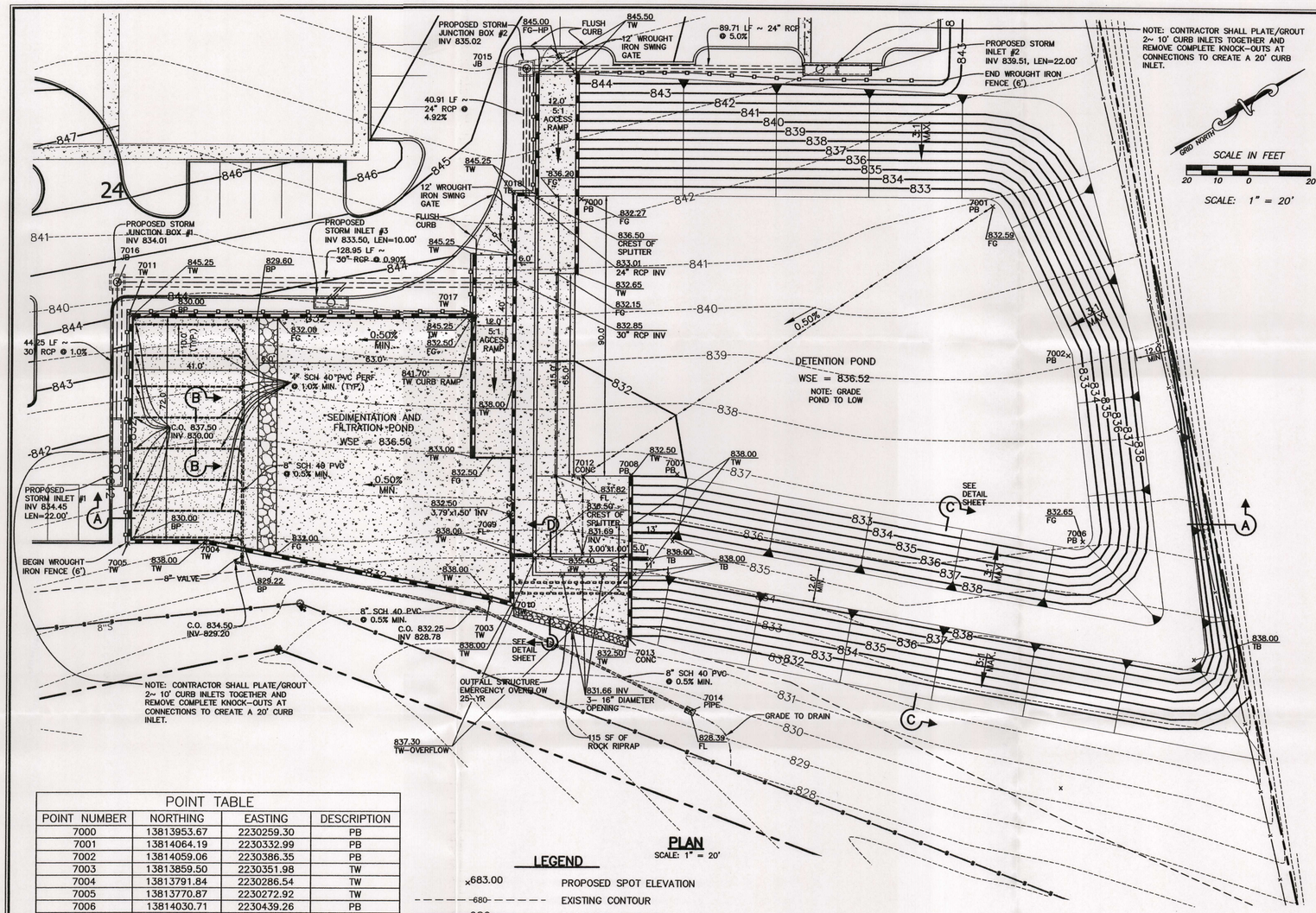
SEDIMENT POND BELOW 832.50 => V_4 = 4,788 * 1/2 (832.50 - 832.00) = 1,197 CF

TOTAL WQP V = 38,259 CF

REQUIRED = 37,097 CF

POND OK

* AREA CALCULATED WITH DIGITAL FILE



PLAN
SCALE: 1" = 20'

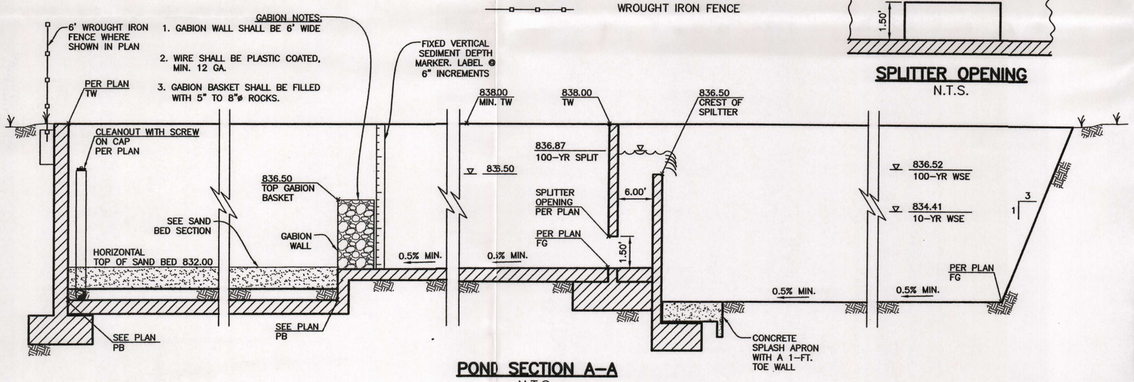
POINT TABLE			
POINT NUMBER	NORTHING	EASTING	DESCRIPTION
7000	13813953.67	2230259.30	PB
7001	13814064.19	2230332.99	PB
7002	13814059.06	2230386.35	PB
7003	13813859.50	2230351.98	TW
7004	13813791.84	2230286.54	TW
7005	13813770.87	2230272.92	TW
7006	13814030.71	2230439.26	PB
7007	13813932.08	2230350.53	PB
7008	13813919.46	2230342.67	PB
7009	13813880.04	2230332.49	FL
7010	13813864.77	2230357.84	TW
7011	13813811.17	2230210.86	TW
7012	13813903.62	2230332.90	CONC
7013	13813890.40	2230386.31	CONC
7014	13813894.45	2230417.10	PIPE
7015	13813961.50	2230214.39	JB
7016	13813813.45	2230200.42	JB
7017	13813904.27	2230271.32	TW
7018	13813936.41	2230245.69	TB

LEGEND

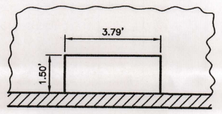
x683.00	PROPOSED SPOT ELEVATION
680	EXISTING CONTOUR
680	PROPOSED CONTOUR
	FLOW DIRECTION
TC	TOP OF CURB
FL	FLOWLINE
FG	FINISH GRADE
FL-HP	FLOWLINE @ HIGH POINT
INV	INVERT
WSE	WATER SURFACE ELEVATION
GB-HP	GRADE BREAK @ HIGH POINT
GB	GRADE BREAK
[000.00]	APPROXIMATE SPOT GRADE
	CONCRETE RETAINING WALL
	WROUGHT IRON FENCE

SPOT ELEVATION LEGEND

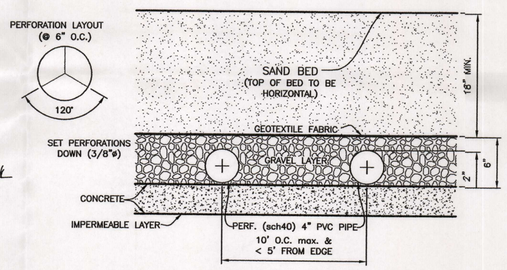
PB	=	POND BOTTOM
TB	=	TOP OF BANK
TOC	=	TOP OF CONCRETE
TW	=	TOP OF WALL
C.O.	=	CLEANOUT
INV.	=	INVERT
TOS	=	TOP OF SAND
JB	=	JUNCTION BOX
CONC	=	CONCRETE
FG	=	FINISH GRADE



POND SECTION A-A
N.T.S.



SPLITTER OPENING
N.T.S.



SAND BED PROFILE B-B
(WITH GRAVEL FILTER)

Table 3.6 Geotextile Fabric Specifications (COA, 1997)

Property	Test Method	Unit	Specification (min.)
Unit Weight		oz/yd^2	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D-1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

*modified

SAND BED WITH GRAVEL LAYER NOTES:

THE TOP LAYER IS TO BE A MINIMUM OF EIGHTEEN (18) INCHES OF 0.02-0.04 INCH DIAMETER SAND WHICH CORRESPOND WITH ASTM C-33 CONCRETE SAND (SMALLER SAND SIZE IS NOT ACCEPTABLE). UNDER THE SAND SHALL BE A LAYER OF ONE-HALF (0.5) TO ONE AND ONE-HALF (1.5) INCH DIAMETER WASHED, ROUNDED, RIVER GRAVEL WHICH PROVIDES A MINIMUM OF TWO (2) INCHES OF COVER OVER THE TOP OF THE UNDERDRAIN LATERAL PIPES. THE SAND AND GRAVEL MUST BE SEPARATED BY A LAYER OF GEOTEXTILE FABRIC MEETING THE SPECIFICATIONS LISTED IN TABLE 3.6 "GEOTEXTILE FABRIC SPECIFICATIONS (COA, 1997). THE GEOTEXTILE FABRIC SHALL MEET THE SPECIFICATIONS LISTED IN TABLE 3.6 TAKEN FROM THE TNRCC TECHNICAL GUIDANCE ON BEST MANAGEMENT PRACTICES, JUNE 1999.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Proposed Conditions Phase II**
Date Prepared: **12/21/2009**

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

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

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

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

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

County =	Comal	
Total project area included in plan * =	11.58	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	6.70	acres
Total post-development impervious cover fraction * =	0.58	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6014	lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = 4

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	9.73	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	6.60	acres
Post-development impervious fraction within drainage basin/outfall area =	0.68	
$L_{M\ THIS\ BASIN}$ =	5924	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Sand Filter**
Removal efficiency = 89 percent

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

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

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

A_C =	8.40	acres
A_I =	6.60	acres
A_P =	1.80	acres
L_R =	6735	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 6014 lbs.

F = 0.89

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	1.60	inches
Post Development Runoff Coefficient =	0.6046	
On-site Water Quality Volume =	29495	cubic feet

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

Off-site area draining to BMP =	1.33	acres
Off-site impervious cover draining to BMP =	0.23	acres
Impervious fraction of off-site area =	0.17	
Off-site Runoff Coefficient =	0.1827	
Off-site Water Quality Volume =	1411	cubic feet
Storage for Sediment =	6181	
Total Capture Volume (required water quality volume(s) x 1.20) =	37087	cubic feet

9. Filter area for Sand Filters Designed as Required in RG-348 — Pages 3-58 to 3-63

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	37087	cubic feet	
Minimum filter basin area =	2949	square feet	
Maximum sedimentation basin area =	11798	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	737	square feet	For maximum water depth of 8 feet

"RECEIVED TCEQ" SAN ANTONIO REGION 2010 JAN 21 PM 3:32

NOTE:
SEE STRUCTURAL PLANS AND STRUCTURAL DETAILS FOR ALL WALLS AND FLOORS OF SEDIMENTATION/FILTRATION BASIN, SPLITTER AND OUTFALL STRUCTURES.

REVISIONS

DATE	DESCRIPTION

STATE OF TEXAS — MICHAEL G. SHORT — 88015 — LICENSED PROFESSIONAL ENGINEER

SEDIMENTATION, FILTRATION & DETENTION POND PLAN & DETAILS

NEW BRAUNFELS CHURCH OF CHRIST
NEW BRAUNFELS, TEXAS

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

P-1

Wednesday, January 20, 2010, 4:25 PM
File Name: F:\060109\Sheets\plot01.dwg

Alan Jones - New Braunfels Church of Christ WPAP

From:	"Shawn Schorn" <Shawns@schultzgroupinc.com>
To:	<agjones@tceq.state.tx.us>
Date:	1/4/2010 9:24 AM
Subject:	New Braunfels Church of Christ WPAP
CC:	"Michael Short" <mshort@schultzgroupinc.com>
Attachments:	Response Letter to Comments Church of Christ.pdf

RECEIVED
JAN 26 2010
COUNTY ENGINEER

Mr. Jones:

Please see attached letter.

Thank you,

Shawn T. Schorn, E.I.T.
The Schultz Group, Inc.
Phone: (830) 606-3913
Fax: (830) 625-2204
shawns@schultzgroupinc.com

THE Schultz Group INC.

P.O. BOX 310483 • NEW BRAUNFELS, TX 78131-0483 • Phone: (830) 606-3913 • Fax: (830) 625-2204

January 4, 2010

RECEIVED
JAN 26 2010
COUNTY ENGINEER

Mr. Allen Jones
Field Operation Division/San Antonio Region
Texas Commission of Environmental Quality
14250 Judson Rd.
San Antonio, TX 78233-4480

Re: Edwards Aquifer Protection Program, Comal County
TYPE OF PLAN: Sewer Collection System (SCS)
NAME OF PROJECT: SH-46 Sewer Adjustment

CHURCH OF CHRIST WPAP A

Allen Jones:

On December 30, 2009 The Schultz Group, Inc. received an Administrative Deficiency Notice from your office. To the best of our knowledge we have corrected all deficiencies in the following manner:

1. The impervious cover tables located in the TCEQ-0587, General Information Form #7, Attachment C and the TCEQ-0584 Water Pollution Abatement Plan #4, Impervious Cover Table are consistent with the revised plans. The amount of impervious cover did not change with the New Braunfels Church of Christ Water Pollution Abatement Plan Addendum #1.

If the TCEQ has any questions or requires additional information please don't hesitate to contact us.

Thank you,

Mike Short
Senior Design Engineer
The Schultz Group, Inc.
Phone: (830) 606-3913
Fax: (830) 625-2204

Alan Jones - RE: New Braunfels Church of Christ WPAP

From: "Shawn Schorn" <Shawns@schultzgroupinc.com>
To: "Alan Jones" <AGJONES@tceq.state.tx.us>
Date: 1/7/2010 8:39 AM
Subject: RE: New Braunfels Church of Christ WPAP
CC: "Michael Short" <mshort@schultzgroupinc.com>
Attachments: Response Letter to Comments Church of Christ#3.pdf

RECEIVED
JAN 26 2010
COUNTY ENGINEER

Mr. Jones:

Please see attached letter addressing your comments. If you have any questions or require additional information please don't hesitate to contact us.

Thank you,

Shawn T. Schorn, E.I.T.
The Schultz Group, Inc.
Phone: (830) 606-3913
Fax: (830) 625-2204
shawns@schultzgroupinc.com

From: Alan Jones [mailto:AGJONES@tceq.state.tx.us]
Sent: Wednesday, January 06, 2010 3:19 PM
To: Shawn Schorn
Subject: Re: New Braunfels Church of Christ WPAP

Hello Shawn,
Trying to get my numbers to match. If 0.02 acres of existing impervious cover associated with the well is subtracted from 6.74 acres (shown as "total post-development impervious cover within the limits of the plan", calculations, Phase 2, Required Load Reduction) then the amount of impervious cover to be added for the plan is 6.72 acres?

Also, the information in the Re: block of the letter you e-mailed shows a different plan.

Thanks for your help,
Will try to have the approval letter ready for review tomorrow.
Alan

>>> "Shawn Schorn" <Shawns@schultzgroupinc.com> 1/4/2010 9:23 AM >>>
Mr. Jones:

Please see attached letter.

Thank you,

Shawn T. Schorn, E.I.T.
The Schultz Group, Inc.
Phone: (830) 606-3913
Fax: (830) 625-2204
shawns@schultzgroupinc.com

THE Schultz Group INC.

P.O. BOX 310483 • NEW BRAUNFELS, TX 78131-0483 • Phone: (830) 606-3913 • Fax: (830) 625-2204

January 6, 2010

Mr. Allen Jones
Field Operation Division/San Antonio Region
Texas Commission of Environmental Quality
14250 Judson Rd.
San Antonio, TX 78233-4480

RECEIVED
JAN 26 2010
COUNTY ENGINEER

Re: Edwards Aquifer Protection Program, Comal County
TYPE OF PLAN: Water Pollution Abatement Plan
NAME OF PROJECT: New Braunfels Church of Christ

Allen Jones:

In response to your email dated January 6, 2010:

The proposed onsite impervious cover is 6.72 acres. In our calculations we show 6.74 acres of onsite impervious cover. The 0.02 acres is from an existing onsite well. The area around the existing well will not drain into the sand filter system. We have redone the calculations and the 0.02 acre reduction in impervious cover reduces the TSS removal required from 6,035 pounds to 6,017 pounds. This reduction in required TSS removal is insignificant and does not change the sand filter system design.

If the TCEQ has any questions or requires additional information please don't hesitate to contact us.

Thank you,

Mike Short
Senior Design Engineer
The Schultz Group, Inc.
Phone: (830) 606-3913
Fax: (830) 625-2204



1/6/10

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Proposed Conditions Phase II
Date Prepared: 12/21/2009

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
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Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

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

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

County =	Comal	
Total project area included in plan * =	11.58	acres
Predevelopment impervious area within the limits of the plan * =	0.02	acres
Total post-development impervious area within the limits of the plan * =	6.72	acres
Total post-development impervious cover fraction * =	0.58	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6017	lbs.

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

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

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

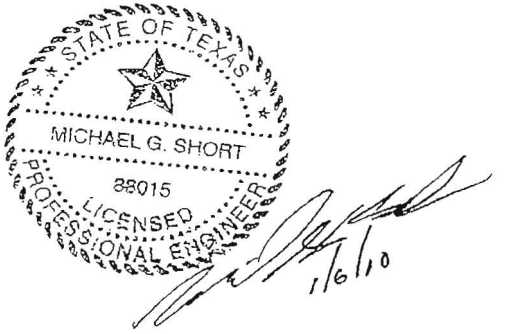
Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	9.73	acres
Predevelopment impervious area within drainage basin/outfall area =	0.23	acres
Post-development impervious area within drainage basin/outfall area =	6.95	acres
Post-development impervious fraction within drainage basin/outfall area =	0.71	
$L_{M\ THIS\ BASIN}$ =	6032	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
Removal efficiency = 89 percent

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



RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

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

A_C =	8.40	acres
A_I =	6.95	acres
A_P =	1.45	acres
L_R =	7086	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	6017	lbs.
F =	0.85	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.32	inches
Post Development Runoff Coefficient =	0.6633	
On-site Water Quality Volume =	26697	cubic feet

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

Off-site area draining to BMP =	1.33	acres
Off-site impervious cover draining to BMP =	0.23	acres
Impervious fraction of off-site area =	0.17	
Off-site Runoff Coefficient =	0.1827	
Off-site Water Quality Volume =	1164	cubic feet
Storage for Sediment =	5572	
Total Capture Volume (required water quality volume(s) x 1.20) =	33434	cubic feet

9. Filter area for Sand Filters Designed as Required in RG-348 Pages 3-58 to 3-63

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	33434	cubic feet	
Minimum filter basin area =	2670	square feet	
Maximum sedimentation basin area =	10679	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	667	square feet	For maximum water depth of 8 feet

COMAL CO.

TCEQ
Protecting Texas by Reducing and Preventing Pollution

FAX TRANSMITTAL

DATE: 12/18/2009 NUMBER OF PAGES *(including this cover sheet)*: 2

TO: Name **Mr. Michael G. Short, P.E.**
Organization **The Schultz Group, Inc.**
FAX Number **(830) 625-2204**

TO: Name **Mr. Glendon Eppler**
Organization **New Braunfels Church of Christ**
FAX Number **(830) 625-2204 (same # as Schultz Group, Inc.)**

FROM: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Name **Alan G. Jones**
Division/Region **Field Operations Division, Region 13 (San Antonio)**
Telephone Number **(210) 403-4074**
FAX Number **(210) 545-4329**

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ, located at 1665 Business Loop 35 South, New Braunfels, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2377.03, Investigation No. 781293
Regulated Entity No. RN104726906

We are in the process of technically reviewing the WPAP application you submitted for the above-referenced project. Before we can proceed with our review, the following comments relating to the application must be addressed:

1. TCEQ-0584, Water Pollution Abatement Plan, #22. Site Plan -Drainage Area Map
a. On Sheet D-1, Drainage Areas P3 (Phase 1) and F3 (Phase 2) look to drain to P1 (Phase 1) and F1 (Phase 2). Please explain. The site plan should be changed to better show measures used to isolate storm water runoff. The drainage area limit for sand filter systems is 10 acres (see p. 3-4 of RG-348).
b. Also, part of P4/F4 that includes the driveway looks to be a separate drainage area that drains to Alyssa Way. Is runoff from the driveway uncaptured? If so, please label it as such.

2. TCEQ-0600, Permanent Stormwater Section, #7, Attachment C – Description of BMPs.
a. Please relate how the water well near the northwest corner of the site is protected. Has it been properly plugged and abandoned in accordance with 16 TAC Ch. 76?
b. Please add some details about the sand filter system and its construction. The description might be something like: "A partial sedimentation/filtration basin is sized to capture the first _____ inches of stormwater run-off from ____ acres of impervious cover within a ____ acre catchment area (Drainage Area _____), providing a total capture volume of _____ cubic feet (_____ cubic feet required) to treat _____ pounds of total suspended solids. A _____ filtration system will consist of _____ square feet of sand (_____ square feet required), _____ inches thick, with underdrain piping surrounded by gravel. Sand and gravel layers will be separated with filter fabric and contained above a _____ liner. _____ acres of new impervious cover in Drainage Area ____ will not be captured for treatment and will be accounted for by overtreatment at/by _____." Please also give a basic description of the flow path of treated runoff and the function of the detention pond.

3. TCEQ-0600, Permanent Stormwater Section, #10, Attachment F – Construction Plans
Sheet P-1 shows some construction plans and details of a partial sedimentation and filtration system. Screw-on cleanouts of the underdrain pipes need to be shown. A note on P-1: "See structural plans and structural details for all walls and floors of sedimentation/filtration basin, splitter and outfall structures." These plans and details with specifications were not found in the plan application. Please provide them.

We ask that you submit one original and three copies of the amended materials to supplement the WPAP application to this office by no later than **14 days from the date of this letter** to avoid denial of the plan. If the response to this notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, a second notice will be sent to you requiring a response within 14 days from the notice date. If the response to the second notice is not recieved, is incomplete or inadequate, or provides new information that is incomplete or inadaquate, the application will be denied unless you provide written notification that the application is being withdrawn. Please note that the application fee will be forfeited if the plan is not withdrawn. If you have any questions or require additional information, please contact Alan G. Jones the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4074.

** Transmit Conf. Report **

P.1 Dec 18 2009 14:49

Fax/Phone Number	Mode	Start	Time	Page	Result	Note
918306252204	NORMAL	18,14:49	0'27"	2	# [illegible] K	

TCEQ
Protecting Texas by Reducing and Preventing Pollution

FAX TRANSMITTAL

DATE. 12/18/2009 NUMBER OF PAGES *(including this cover sheet).* 2

TO. Name Mr. Michael G. Short, P.E.
Organization The Schultz Group, Inc.
FAX Number (830) 626-2204

TO Name Mr. Glendon Eppler
Organization New Braunfels Church of Christ
FAX Number (830) 626-2204 (same # as Schultz Group, Inc.)

FROM TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Name Alan G. Jones
Division/Region Field Operations Division, Region 13 (San Antonio)
Telephone Number (210) 403-4074
FAX Number (210) 545-4329

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ, located at 1663 Business Loop 35 South, New Braunfels, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP) [illegible] Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2377.03, Investigation No. 781293
Regulated Entity No. RN104776906

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a. On Sheet D 1, Drainage Areas P3 (Phase 1) and F3 (Phase 2) look to drain to P1 (Phase 1) and P1 (Phase 2). Please explain. The site plan should be changed to better show measures used to isolate storm water runoff. The drainage area limit for sand filter systems is 10 acres (see p. 3-4 of RG 348).
b. Also, part of P4/F4 that includes the driveway looks to be a separate drainage area that drains to Alyssa Way. Is runoff from the driveway uncaptured? If so, please label it as such.

TCEQ
Protecting Texas by Reducing and Preventing Pollution

FAX TRANSMITTAL

DATE: 12/30/2009 NUMBER OF PAGES *(including this cover sheet):* 2

TO: Name **Mr. Michael G. Short, P.E.**
Organization **The Schultz Group, Inc.**
FAX Number **(830) 625-2204**

TO: Name **Mr. Glendon Eppler**
Organization **New Braunfels Church of Christ**
FAX Number **(830) 625-2204 (same # as Schultz Group, Inc.)**

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Name **Alan G. Jones**
Division/Region **Field Operations Division, Region 13 (San Antonio)**
Telephone Number **(210) 403-4074**
FAX Number **(210) 545-4329**

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TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2377.03, Investigation No. 781293
Regulated Entity No. RN104726906

We are in receipt of the additional information you have submitted on the above-referenced project for the WPAP application and are in the process of technically reviewing the additional information. Before we can proceed with our review, the following comments relating to the application must be addressed:

1. TCEQ-0587, General Information, #7, Attachment C, and TCEQ-0584, Water Pollution Abatement Plan, #4, Impervious Cover Table.
As catchment and impervious cover area revisions were made, please revise the project description and the impervious cover table to make them consistent.

We ask that you submit one original and three copies of the amended materials to supplement the WPAP application to this office by no later than **14 days from the date of this letter** to avoid denial of the plan. If the response to this notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application will be denied unless you provide written notification that the application is being withdrawn. Please note that the application fee will be forfeited if the plan is not withdrawn. If you have any questions or require additional information, please contact Alan G. Jones of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4074.

** Transmit Conf. Report **

P.1 Dec 30 2009 16:10

Fax/Phone Number	Mode	Start	Time	Page	Result	Note
918306252204	NORMAL	30,16:10	0'22"	2	# (K	

TCEQ
Protecting Texas by Reducing and Preventing Pollution

FAX TRANSMITTAL

DATE: 12/30/2009 NUMBER OF PAGES *(including this cover sheet)* 2

TO: Name Mr. Michael G. Short, P.E.
Organization The Schultz Group, Inc.
FAX Number (830) 625-2204

TO: Name Mr. Glendon Eppler
Organization New Braunfels Church of Christ
FAX Number (830) 625-2204 (same # as Schultz Group, Inc.)

FROM: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Name Alan G. Jones
Division/Region Field Operations Division, Region 13 (San Antonio)
Telephone Number (210) 403-4074
FAX Number (210) 545-4329

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ, located at 1665 Business Loop 35 South, New Braunfels, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP), 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2377.03, Investigation No. 781293
Regulated Entity No. RN104726906

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As catchment and impervious cover area revisions were made, please revise the project description and the impervious cover table to make them consistent.

** Transmit Conf. Report **

P. 1 Dec 30 2009 16:09

Fax/Phone Number	Mode	Start	Time	Page	Result	Note
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TCEQ
Protecting Texas by Reducing and Preventing Pollution

FAX TRANSMITTAL

DATE 12/30/2009 NUMBER OF PAGES *(including this cover sheet)* 2

TO Name Mr. Michael G. Short, P.E.
Organization The Schultz Group, Inc.
FAX Number (830) 625-2204

TO. Name Mr. Glendon Eppler
Organization New Braunfels Church of Christ
FAX Number (830) 625-2204 (same # as Schultz Group, Inc.)

FROM TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Name Alan G. Jones
Division/Region Field Operations Division, Region 13 (San Antonio)
Telephone Number (210) 403-4074
FAX Number (210) 545-4329

Re Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ, located at 1665 Business Loop 35 South, New Braunfels, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2377.03, Investigation No. 751293
Regulated Entity No. RN104726906

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As calculated and impervious cover area revisions were made, please revise the project description and the impervious cover table to make them consistent.

"RECEIVED TCEQ"
SAN ANTONIO
REGION
2009 DEC 30 AM 10:50

NEW BRAUNFELS CHURCH OF CHRIST WATER POLLUTION ABATEMENT PLAN ADDENDUM #1

December 2009

Prepared for:

New Braunfels Church of Christ
1665 Business Loop 35 South
New Braunfels, TX 78130

Project No. 060109

Prepared By:

The Schultz Group Inc.
2461 Loop 337
New Braunfels, TX 78130
(830) 606-3913

FIRM F-532

THE Schultz Group INC.

P.O. BOX 310483 • NEW BRAUNFELS, TX 78131-0483 • Phone: (830) 606-3913 • Fax: (830) 625-2204

December 30, 2009

RECEIVED
JAN 26 2010
COUNTY ENGINEER

Mr. Allen Jones
Field Operation Division/San Antonio Region
Texas Commission of Environmental Quality
14250 Judson Rd.
San Antonio, TX 78233-4480

Re: Edwards Aquifer Protection Program, Comal County
TYPE OF PLAN: Sewer Collection System (SCS)
NAME OF PROJECT: SH-46 Sewer Adjustment

Allen Jones:

On December 18, 2009 The Schultz Group, Inc. received an Administrative Deficiency Notice from your office. To the best of our knowledge we have corrected all deficiencies in the following manner:

Responses to Deficiencies

1. The drainage area map has been revised to correctly show flows to and around the Sand Filter System. The proposed drainage area draining to the Sand Filter System has been reduced. This was done by designing a channel to reroute flows from drainage area F3 around the site. Also because the 1.07 acres used for detention will never reach the sand filter system it has been removed from the sand filter system catchment area. This reduces the sand filter system catchment area to 9.73 acres. The portion of driveway that is uncaptured has been labeled as such.

2. The impervious cover located onsite has been graded to drain away from the well located onsite. The onsite well has not been plugged and capped in accordance with 16 TAC Ch. 76. The future of the well is unknown at this time; however it will be protected from runoff via 6" stand up curb.

   A partial sedimentation/filtration basin is sized to capture the first 1.32 inches of stormwater run-off from 6.97 acres of impervious cover within a 9.73 acre catchment area, providing a total capture volume of 33,968 cubic feet where only 33,607 cubic feet is needed to treat 6,035 pounds of total suspended solids. A sand filtration system will consist of 2,800 square feet where only 2,684 square feet is needed of sand, 18 inches thick, with under drain piping surrounded by gravel. Sand and gravel layers will be separated with filter fabric and contained above an impermeable concrete liner. 0.10 acres of new impervious cover common to drive draining to Alyssa Way in Drainage area F4 will not be captured for treatment and will be accounted for by overtreatment within the sand filter system.

The sand filter system has been designed to treat the first 1.32 inches of stormwater runoff. The first 1.32 inches of stormwater will flow through the splitter and into the sand filter system via a 3.79" x 1.50" opening. The remainder of stormwater runoff will then flow into the detention pond. The detention pond has been designed to mitigate increases in storm water runoff as a result of the increase in impervious cover. The detention pond has been designed in accordance with the City of New Braunfels Drainage and Erosion Control Design Manual (September 2000). The sand filter system has been designed in accordance with the TCEQ's Complying with Edwards Aquifer Rules Technical Guidance on Best Management Practices (July 2005).

3. On sheet P-1, screws on cleanouts of the under drain pipes have been shown. The sand bed profile has been clarified to show a concrete impermeable layer. A splitter detail has been added to show size of splitter opening to sand filter system. In the legend it shows the retaining walls as being concrete.

Additional Items Changed

The following items have been changed and are included in the WPAP Addendum #1:

1. The TSS removal calculations for Phase I and Phase II have been revised to show the decrease in the sand filter system catchment area.

2. Hydraulic calculations have been added for the flow splitter weir, flow splitter orifice check, emergency overflow weir, and the water quality pond and detention pond freeboard.

3. Attachment B – Volume and Character of Stormwater. The 10-year and 100-year flows have been updated to account for the rerouting of flows from drainage area F3.

4. Attachment B – BMPs for Upgradient Stormwater. Clarification of the small portion of drive not draining to the sand filter system has been added.

5. Attachment C – BMPs for Onsite Stormwater. Clarification on the onsite well has been added. The paragraph from the TCEQ Deficiency Letter #2 has been filled out and added. Clarification for the detention pond and sand filter system has been added.

6. Attachment D – BMPs for Surface Streams. Clarification on the onsite well has been added. The paragraph from the TCEQ Deficiency Letter #2 has been filled out and added.

7. Application Fee Form. The acreage shown on the Fee Form has been corrected and now shows 11.58 acres. This change does not affect the total fee.

8. Attachment C – Sequence of Major Activities. The disturbed acreage has been added for the proposed channels for drainage areas P3 and F3.

If the TCEQ has any questions or requires additional information please don't hesitate to contact us.

Thank you,

Mike Short
Senior Design Engineer
The Schultz Group, Inc.
Phone: (830) 606-3913
Fax: (830) 625-2204

TCEQ
Protecting Texas by Reducing and Preventing Pollution

FAX TRANSMITTAL

DATE: 12/18/2009 NUMBER OF PAGES *(including this cover sheet):* 2

TO: Name **Mr. Michael G. Short, P.E.**
Organization **The Schultz Group, Inc.**
FAX Number **(830) 625-2204**

TO: Name **Mr. Glendon Eppler**
Organization **New Braunfels Church of Christ**
FAX Number **(830) 625-2204 (same # as Schultz Group, Inc.)**

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Division/Region **Field Operations Division, Region 13 (San Antonio)**
Telephone Number **(210) 403-4074**
FAX Number **(210) 545-4329**

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ, located at 1665 Business Loop 35 South, New Braunfels, Texas
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2377.03, Investigation No. 781293
Regulated Entity No. RN104726906

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a. On Sheet D-1, Drainage Areas P3 (Phase 1) and F3 (Phase 2) look to drain to P1 (Phase 1) and F1 (Phase 2). Please explain. The site plan should be changed to better show measures used to isolate storm water runoff. The drainage area limit for sand filter systems is 10 acres (see p. 3-4 of RG-348).
b. Also, part of P4/F4 that includes the driveway looks to be a separate drainage area that drains to Alyssa Way. Is runoff from the driveway uncaptured? If so, please label it as such.

2. TCEQ-0600, Permanent Stormwater Section, #7, Attachment C – Description of BMPs.
a. Please relate how the water well near the northwest corner of the site is protected. Has it been properly plugged and abandoned in accordance with 16 TAC Ch. 76?
b. Please add some details about the sand filter system and its construction. The description might be something like: "A partial sedimentation/filtration basin is sized to capture the first _____ inches of stormwater run-off from ____ acres of impervious cover within a ____ acre catchment area (Drainage Area _____), providing a total capture volume of _____ cubic feet (_____ cubic feet required) to treat _____ pounds of total suspended solids. A _____ filtration system will consist of _____ square feet of sand (_____ square feet required), _____ inches thick, with underdrain piping surrounded by gravel. Sand and gravel layers will be separated with filter fabric and contained above a _____ liner. _____ acres of new impervious cover in Drainage Area ____ will not be captured for treatment and will be accounted for by overtreatment at/by _____." Please also give a basic description of the flow path of treated runoff and the function of the detention pond.

3. TCEQ-0600, Permanent Stormwater Section, #10, Attachment F – Construction Plans
Sheet P-1 shows some construction plans and details of a partial sedimentation and filtration system. Screw-on cleanouts of the underdrain pipes need to be shown. A note on P-1: "See structural plans and structural details for all walls and floors of sedimentation/filtration basin, splitter and outfall structures." These plans and details with specifications were not found in the plan application. Please provide them.

We ask that you submit one original and three copies of the amended materials to supplement the WPAP application to this office by no later than **14 days from the date of this letter** to avoid denial of the plan. If the response to this notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, a second notice will be sent to you requiring a response within 14 days from the notice date. If the response to the second notice is not recieved, is incomplete or inadequate, or provides new information that is incomplete or inadaquate, the application will be denied unless you provide written notification that the application is being withdrawn. Please note that the application fee will be forfeited if the plan is not withdrawn. If you have any questions or require additional information, please contact Alan G. Jones the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4074.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Phase I
Date Prepared: 12/21/2009

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

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

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

where:

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

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

County =	Comal	
Total project area included in plan * =	11.58	acres
Predevelopment impervious area within the limits of the plan * =	0.02	acres
Total post-development impervious area within the limits of the plan* =	3.49	acres
Total post-development impervious cover fraction * =	0.30	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	**3117**	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 1

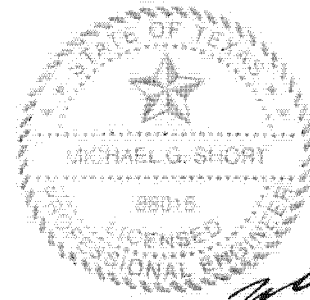
Total drainage basin/outfall area =	5.33	acres
Predevelopment impervious area within drainage basin/outfall area =	0.11	acres
Post-development impervious area within drainage basin/outfall area =	3.60	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.68**	
$L_{M\ THIS\ BASIN}$ =	**3133**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
Removal efficiency = **89** percent

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)



12/20/09

where:

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

A_C =	4.99	acres
A_I =	3.60	acres
A_P =	**1.39**	acres
L_R =	**3680**	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 3117 lbs.

F = **0.85**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.32**	inches
Post Development Runoff Coefficient =	**0.5279**	
On-site Water Quality Volume =	**12622**	cubic feet

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

Off-site area draining to BMP =	0.34	acres
Off-site Impervious cover draining to BMP =	0.11	acres
Impervious fraction of off-site area =	**0.32**	
Off-site Runoff Coefficient =	**0.2700**	
Off-site Water Quality Volume =	**440**	cubic feet
Storage for Sediment =	**2612**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**15674**	cubic feet

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

9. Filter area for Sand Filters Designed as Required in RG-348 Pages 3-58 to 3-63

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	**15674**	cubic feet	
Minimum filter basin area =	**1262**	square feet	
Maximum sedimentation basin area =	**5049**	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	**316**	square feet	For maximum water depth of 8 feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Proposed Conditions Phase II
Date Prepared: 12/21/2009

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
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Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where,

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

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

County =	Comal	
Total project area included in plan * =	11.58	acres
Predevelopment impervious area within the limits of the plan * =	0.02	acres
Total post-development impervious area within the limits of the plan* =	6.74	acres
Total post-development impervious cover fraction =	**0.58**	
P =	**33**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**6035**	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	9.73	acres
Predevelopment impervious area within drainage basin/outfall area =	0.23	acres
Post-development impervious area within drainage basin/outfall area =	6.97	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.72**	
$L_{M\ THIS\ BASIN}$ =	**6050**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Sand Filter	
Removal efficiency =	**89**	percent

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

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

A_C =	8.40	acres
A_I =	6.97	acres
A_P =	**1.43**	acres
L_R =	**7106**	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	8035	lbs.
F =	**0.85**	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**1.32**	inches
Post Development Runoff Coefficient =	**0.6669**	
On-site Water Quality Volume =	**26842**	cubic feet

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

Off-site area draining to BMP =	1.33	acres
Off-site Impervious cover draining to BMP =	0.23	acres
Impervious fraction of off-site area =	**0.17**	
Off-site Runoff Coefficient =	**0.1827**	
Off-site Water Quality Volume =	**1164**	cubic feet
Storage for Sediment =	**5601**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**33607**	cubic feet

9. Filter area for Sand Filters Designed as Required in RG-348 Pages 3-58 to 3-63

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	**33607**	cubic feet	
Minimum filter basin area =	**2684**	square feet	
Maximum sedimentation basin area =	**10737**	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	**671**	square feet	For maximum water depth of 8 feet

Calculations By: Mike Short **12/21/2009**

Project No.: 060109

Hydraulic Calculations

Flow Splitter Weir

WQP height needed is 4.0-ft deep with an invert of 832.50; therefore, the Splitter Crest was set at 836.50

$Crest_{splitter} := 836.50$

$Q_{100} := 77$ Pond Inflow Q100 (cfs) $C_w := 3.0$ Weir Coefficient $L := 115$ Width of weir(ft)

$$H := \left(\frac{Q_{100}}{L \times C_w}\right)^{\frac{2}{3}} \qquad H = 0.37$$ Height of flow relative to weir crest (ft)

$WSE_{splitter} := Crest_{splitter} + H$ $WSE_{splitter} = 836.87$

Flow Splitter Orifice Check

$Crest_{splitter} = 836.50$ $C_o := .67$ $Invert_{orifice} := 832.50$ $Height_{orifice} := 1.5$ (ft) $Q_{25} := 55$ Pond Inflow Q-25 (cfs)

$$SpringLineElevation := Invert_{orifice} + \frac{Height_{orifice}}{2} \qquad SpringLineElevation = 833.25$$

$H := Crest_{splitter} - SpringLineElevation$ $H = 3.25$

$$W := \frac{Q_{25}}{C_o \times Height_{orifice} \times \sqrt{2 \times 32.2 \times H}} \qquad W = 3.783 \quad (ft)$$

Emergency Overflow Weir

DET 100-yr WSE is approximately 836.52; therefore, the Emergency Overflow Crest was set at 837.00.

$Q_{25} := 55$ Pond Inflow Q-25 (cfs) $C_w := 3.0$ Weir Coefficient $L := 40$ Width of weir(ft)

$$H := \left(\frac{Q_{25}}{L \times C_w}\right)^{\frac{2}{3}} \qquad H = 0.59$$ Height of flow relative to weir crest (ft)

$WSE_{overflow} := 837.00 + H$ $WSE_{overflow} = 837.59$

WQP and DET Pond Freeboard

$WSE_{PlusFreeBoard} := WSE_{overflow} + .5$ $WSE_{PlusFreeBoard} = 838.09$



Attachment B – Volume and Character of Stormwater

Currently the proposed New Braunfels Church of Christ site is undeveloped with the exception of one well located on the northwest corner of the property. Onsite flows are separated by an existing swale. All flows eventually make there way into a tributary to Bleider's Creek.

The proposed impervious cover will be graded to drain to a detention pond. All drainage improvements have been designed to restrict flows to undeveloped conditions immediately downstream for the 10-year and 100-year storm frequencies. Existing conditions runoff for the 10-year and 100-year storms are 82 cfs and 165 cfs, respectively. Future Phase 2 conditions runoffs for the 10-year and 100-year storms are 81 cfs and 160 cfs, respectively.

A Sand Filter System is proposed for this development. This system has been designed to mitigate the effects of the increase in impervious cover in the Edwards Aquifer Recharge Zone. It has been designed using the TCEQ's Complying with Edwards Aquifer Rules Technical Guidance on Best Management Practices (July 2005). Pollutants that can be expected after construction are sediments, oil and gas from vehicles, insect pesticides, and lawn care products.

ATTACHMENT C – SEQUENCE OF MAJOR ACTIVITIES

The following is a sequence of major activities which will involve soil disturbance along with an estimate of area disturbed by each activity

Sequence No.	Description of Soil Disturbing Activity	Estimated Area Disturbed by each Activity (Acres)
1	Installation of Phase 1 Construction Exit and Erosion Control	0.50
2	Phase 1 Clearing and Grubbing of Detention Pond and Sand Filter System	1.75
3	Phase 1 Excavation of Detention Pond, Sand Filter System, and Construction of Outfall Structure	1.75
4	Phase 1 Clearing and Grubbing of Parking Area	3.25
5	Phase 1 Excavation and Construction of Parking Area	3.25
6	Phase 1 Construction of New Driveway.	1.00
7	Phase 1 Grading of Channel for Drainage Area P3	0.25
8	Phase 1 Building Pad Site Preparations	0.75
9	Installation of Phase 2 Construction Exit and Erosion Control	0.50
10	Phase 2 Clearing and Grubbing of Parking Area	3.50
11	Phase 2 Excavation and Construction of Parking Area	3.50
12	Phase 1 Grading of Channel for Drainage Area F3	0.20
13	Phase 2 Building Pad Site Preparations	0.75

Attachment B – BMPs for Upgradient Stormwater

Both Phase 1 and Phase 2 will have upstream runoff entering the site. (See Drainage Area Map) This upstream runoff has been accounted for in the detention pond design. Impervious cover located upstream consists of a few single family residences and has been accounted for in the sand filter system design. 0.10 acres of new impervious cover common to drive draining to Alyssa Way in Drainage area F4 will not be captured for treatment and will be accounted for by overtreatment by the sand filter system.

Attachment C – BMPs for Onsite Stormwater

The Best Management Practice used as the permanent control device for The New Braunfels Church of Christ Phase 1 and Phase 2 will be a Sand Filter System. The Sand Filter System has been designed to mitigate all impervious cover onsite and the impervious cover located within the drainage located immediately upstream of our site.

The impervious cover located onsite has been graded to drain away from the well located onsite. The onsite well has not been plugged and capped in accordance with 16 TAC Ch. 76. The future of the well is unknown at this time; however it will be protected from runoff via 6" stand up curb.

A partial sedimentation/filtration basin is sized to capture the first 1.32 inches of stormwater run-off from 6.97 acres of impervious cover within a 9.73 acre catchment area, providing a total capture volume of 33,968 cubic feet where only 33,607 cubic feet is needed to treat 6,035 pounds of total suspended solids. A sand filtration system will consist of 2,800 square feet where only 2,684 square feet is needed of sand, 18 inches thick, with under drain piping surrounded by gravel. Sand and gravel layers will be separated with filter fabric and contained above an impermeable concrete liner. 0.10 acres of new impervious cover common to drive draining to Alyssa Way in Drainage area F4 will not be captured for treatment and will be accounted for by overtreatment by the sand filter system.

The sand filter system has been designed to treat the first 1.32 inches of stormwater runoff. The first 1.32 inches of stormwater will flow through the splitter and into the sand filter system via a 3.79" x 1.50" opening. The remainder of stormwater runoff will then flow into the detention pond. The detention pond has been designed to mitigate increases in storm water runoff as a result of the increase in impervious cover. The detention pond has been designed in accordance with the City of New Braunfels Drainage and Erosion Control Design Manual (September 2000). The sand filter system has been designed in accordance with the TCEQ's Complying with Edwards Aquifer Rules Technical Guidance on Best Management Practices (July 2005).

Attachment D – BMPs for Surface Streams

The Best Management Practice used as the permanent control device for The New Braunfels Church of Christ Phase 1 and Phase 2 will be a Sand Filter System. The Sand Filter System has been designed to mitigate all proposed impervious cover onsite. The Sand Filter System will adequately protect the adjacent tributary to Bleider's Creek.

A partial sedimentation/filtration basin is sized to capture the first 1.32 inches of stormwater run-off from 6.97 acres of impervious cover within a 9.73 acre catchment area, providing a total capture volume of 33,968 cubic feet where only 33,607 cubic feet is needed to treat 6,035 pounds of total suspended solids. A sand filtration system will consist of 2,800 square feet where only 2,684 square feet is needed of sand, 18 inches thick, with under drain piping surrounded by gravel. Sand and gravel layers will be separated with filter fabric and contained above an impermeable concrete liner. 0.10 acres of new impervious cover common to drive draining to Alyssa Way in Drainage area F4 will not be captured for treatment and will be accounted for by overtreatment by the sand filter system.

The impervious cover located onsite has been graded to drain away from the well located onsite. The onsite well has not been plugged and capped in accordance with 16 TAC Ch. 76. The future of the well is unknown at this time; however it will be protected from runoff via 6" stand up curb.

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Application Fee Form

NAME OF PROPOSED REGULATED ENTITY: New Braunfels Church of Chirst
REGULATED ENTITY LOCATION: North side of the intersection of State Hwy 46 and State Hwy 1863 in New Braunfels, Texas. Located approximately 1.5 miles west of Loop 337

NAME OF CUSTOMER: New Braunfels Church of Christ
CONTACT PERSON: Glendon Eppler PHONE: (830) 980-7842
(Please Print)

Customer Reference Number (if issued): CN _____ (nine digits)

Regulated Entity Reference Number (if issued): RN **104726906** (nine digits)

Austin Regional Office (3373) ☐ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362) ☐ Bexar ☒ Comal ☐ Medina ☐ Kinney ☐ Uvalde

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

☐ **Austin Regional Office**

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

☒ **San Antonio Regional Office**

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

Site Location (Check All That Apply): ☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	11.58 Acres	$6500.00
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

_____ _____
Signature Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Application Fee Schedule
30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications
Contributing Zone Plans and Modifications

PROJECT	PROJECT AREA IN ACRES	FEE
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

PROJECT	COST PER LINEAR FOOT	MINIMUM FEE MAXIMUM FEE
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

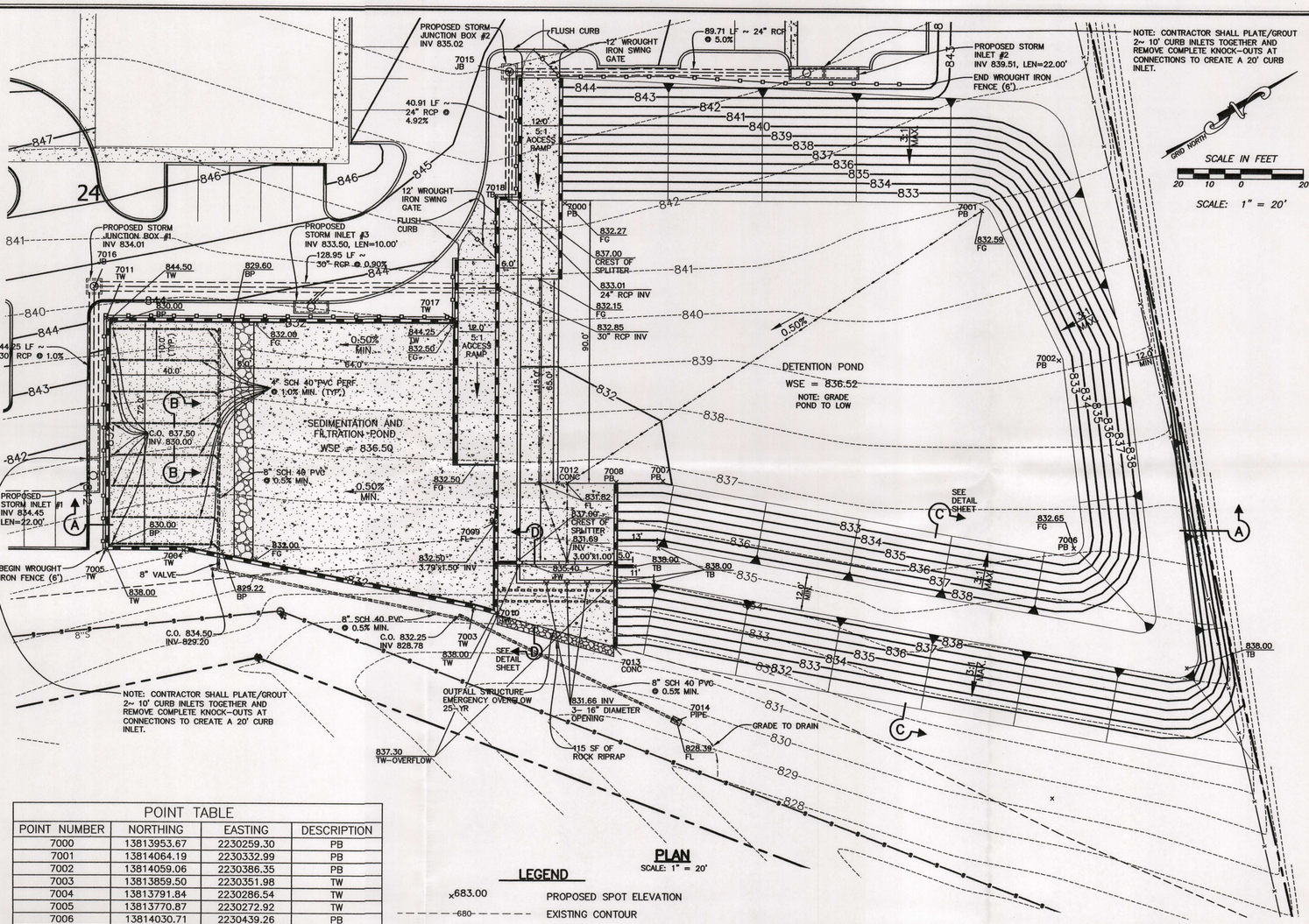
PROJECT	COST PER TANK OR PIPING SYSTEM	MINIMUM FEE MAXIMUM FEE
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

PROJECT	FEE
Exception Request	$500

Extension of Time Requests

PROJECT	FEE
Extension of Time Request	$150



PLAN
SCALE: 1" = 20'

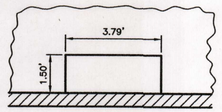
POINT TABLE			
POINT NUMBER	NORTHING	EASTING	DESCRIPTION
7000	13813953.67	2230259.30	PB
7001	13814064.19	2230332.99	PB
7002	13814059.06	2230386.35	PB
7003	13813859.50	2230351.98	TW
7004	13813791.84	2230286.54	TW
7005	13813770.87	2230272.92	TW
7006	13814030.71	2230439.26	PB
7007	13813932.08	2230350.53	PB
7008	13813919.46	2230342.67	PB
7009	13813880.04	2230332.49	FL
7010	13813864.77	2230357.84	TW
7011	13813811.17	2232010.86	TW
7012	13813903.62	2230332.90	CONC
7013	13813890.40	2230386.31	CONC
7014	13813894.45	2230417.10	PIPE
7015	13813961.50	2230214.39	JB
7016	13813813.45	2230200.42	JB
7017	13813904.27	2230271.32	TW
7018	13813936.41	2230245.69	TB

LEGEND

x683.00	PROPOSED SPOT ELEVATION
680	EXISTING CONTOUR
680	PROPOSED CONTOUR
	FLOW DIRECTION
TC	TOP OF CURB
FL	FLOWLINE
FG	FINISH GRADE
FL-HP	FLOWLINE @ HIGH POINT
INV	INVERT
WSE	WATER SURFACE ELEVATION
GB-HP	GRADE BREAK @ HIGH POINT
GB	GRADE BREAK
[000.00]	APPROXIMATE SPOT GRADE
	CONCRETE RETAINING WALL
	WROUGHT IRON FENCE

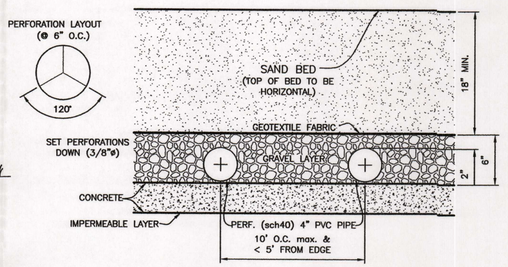
SPOT ELEVATION LEGEND

PB	=	POND BOTTOM
TB	=	TOP OF BANK
TOC	=	TOP OF CONCRETE
TW	=	TOP OF WALL
C.O.	=	CLEANOUT
INV.	=	INVERT
TOS	=	TOP OF SAND
JB	=	JUNCTION BOX
CONC	=	CONCRETE
FG	=	FINISH GRADE



SPLITTER OPENING
N.T.S.

POND SECTION A-A
N.T.S.



SAND BED PROFILE B-B
(WITH GRAVEL FILTER)

Table 3.6 Geotextile Fabric Specifications (COA, 1997)

Property	Test Method	Unit	Specification (min.)
Unit Weight		oz/yd^{-2}	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D-1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

*modified

SAND BED WITH GRAVEL LAYER NOTES:
THE TOP LAYER IS TO BE; A MINIMUM OF EIGHTEEN (18) INCHES OF 0.02-0.04 INCH DIAMETER SAND WHICH CORRESPOND WITH ASTM C-33 CONCRETE SAND (SMALLER SAND SIZE IS NOT ACCEPTABLE). UNDER THE SAND SHALL BE A LAYER OF ONE-HALF (0.5) TO ONE AND ONE-HALF (1.5) INCH DIAMETER WASHED, ROUNDED, RIVER GRAVEL WHICH PROVIDES A MINIMUM OF TWO (2) INCHES OF COVER OVER THE TOP OF THE UNDERDRAIN LATERAL PIPES. THE SAND AND GRAVEL MUST BE SEPARATED BY A LAYER OF GEOTEXTILE FABRIC MEETING THE SPECIFICATIONS LISTED IN TABLE 3.6 "GEOTEXTILE FABRIC SPECIFICATIONS (COA, 1997). THE GEOTEXTILE FABRIC SHALL MEET THE SPECIFICATIONS LISTED IN TABLE 3.6 TAKEN FROM THE TNRCC TECHNICAL GUIDANCE ON BEST MANAGEMENT PRACTICES, JUNE 1999.

NOTE:
SEE STRUCTURAL PLANS AND STRUCTURAL DETAILS FOR ALL WALLS AND FLOORS OF SEDIMENTATION/FILTRATION BASIN, SPLITTER AND OUTFALL STRUCTURES.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Proposed Conditions Phase II**
Date Prepared: **12/21/2009**

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

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

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

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

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

County =	**Comal**	
Total project area included in plan * =	**11.58**	acres
Predevelopment impervious area within the limits of the plan * =	**0.02**	acres
Total post-development impervious area within the limits of the plan* =	**6.74**	acres
Total post-development impervious cover fraction * =	**0.58**	
P =	**33**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**6035**	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	**9.73**	acres
Predevelopment impervious area within drainage basin/outfall area =	**0.23**	acres
Post-development impervious area within drainage basin/outfall area =	**6.97**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.72**	
$L_{M\ THIS\ BASIN}$ =	**6050**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Sand Filter**
Removal efficiency = **89** percent

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

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

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

A_C =	**8.40**	acres
A_I =	**6.97**	acres
A_P =	**1.43**	acres
L_R =	**7106**	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = **6035** lbs.

F = **0.85**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	**1.32**	inches
Post Development Runoff Coefficient =	**0.6669**	
On-site Water Quality Volume =	**26842**	cubic feet

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

Off-site area draining to BMP =	**1.33**	acres
Off-site Impervious cover draining to BMP =	**0.23**	acres
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Off-site Runoff Coefficient =	**0.1827**	
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Storage for Sediment =	**5601**	
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Maximum sedimentation basin area =	**10737**	square feet	**For minimum water depth of 2 feet**
Minimum sedimentation basin area =	**671**	square feet	**For maximum water depth of 8 feet**

REVISIONS

DESCRIPTION	DATE

MICHAEL G. SHORT 88015 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS 12-21-09

SEDIMENTATION, FILTRATION & DETENTION POND PLAN & DETAILS

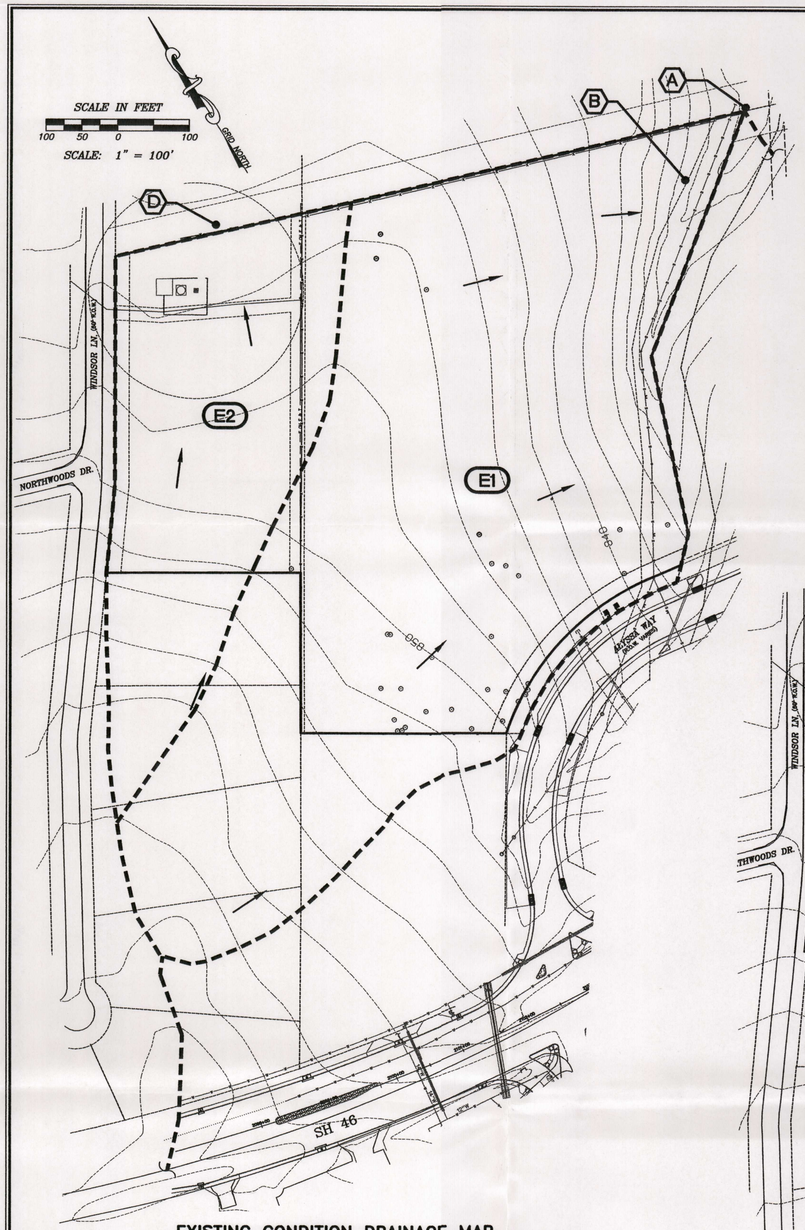
CHURCH OF CHRIST OF NEW BRAUNFELS
NEW BRAUNFELS, TEXAS

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

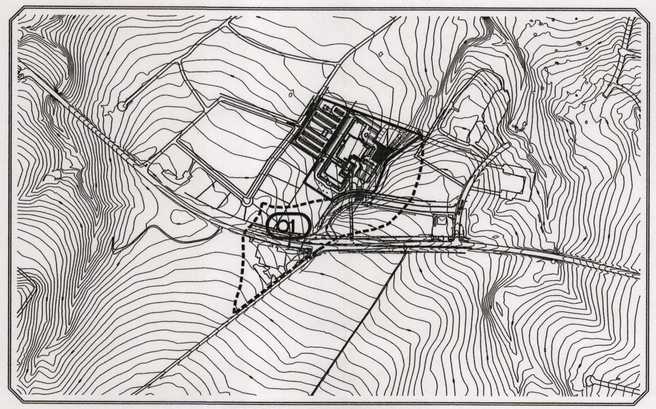
DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

P-1

Tuesday, December 22, 2009, 10:47 AM
File Name: P:\060109\Sheet Split\1.dwg

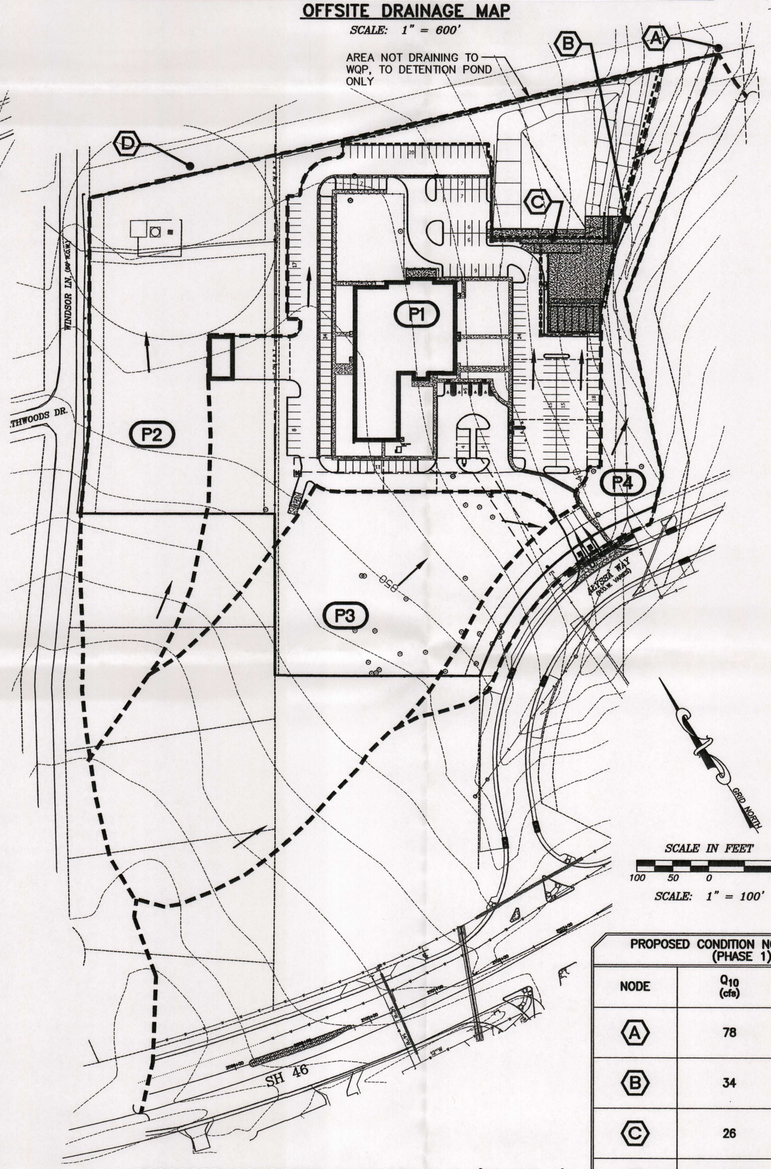


EXISTING CONDITION DRAINAGE MAP

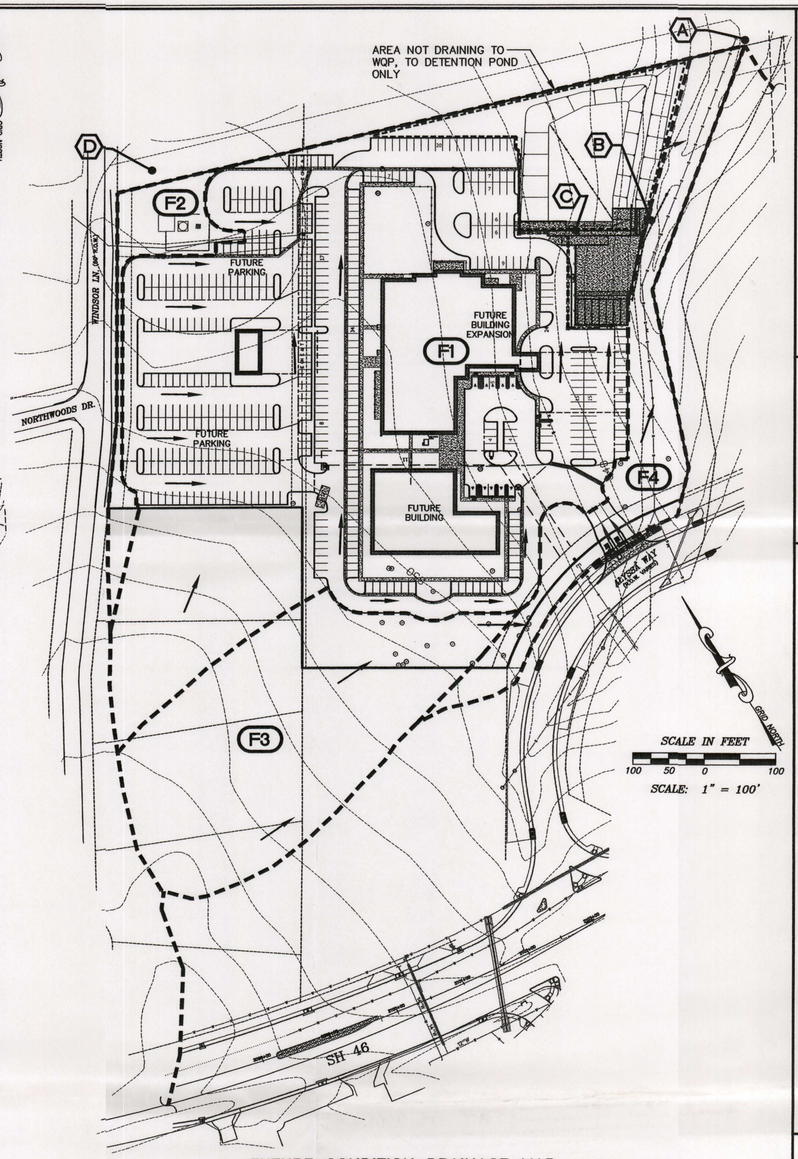


OFFSITE DRAINAGE MAP

SCALE: 1" = 600'



PROPOSED CONDITION DRAINAGE MAP (PHASE 1)



FUTURE CONDITION DRAINAGE MAP (PHASE 2)

EXISTING CONDITION NODE SUMMARY		
NODE	Q_{10} (cfs)	Q_{100} (cfs)
A	82	165
B	38	79
D	13	27

DRAINAGE AREA SUMMARY			
LOCATION	AREA (AC.)	Q_{10} (cfs)	Q_{100} (cfs)
E1	11.6	38	79
E2	4.0	13	27
P1	6.4	26	49
P2	3.3	10	22
P3	4.3	16	32
P4	1.5	5	10
F1	10.8	42	77
F2	0.5	2	4
F3	2.8	10	21
F4	1.4	5	10
O1	16.4	48	95

PROPOSED CONDITION NODE SUMMARY (PHASE 1)		
NODE	Q_{10} (cfs)	Q_{100} (cfs)
A	78	150
B	34	63
C	26	49
D	10	22

FUTURE CONDITION NODE SUMMARY (PHASE 2)		
NODE	Q_{10} (cfs)	Q_{100} (cfs)
A	81	160
B	33	67
C	42	77
D	2	4

LEGEND

- DRAINAGE AREA BOUNDARY
- X — DRAINAGE AREA
- PROPOSED DRAINAGE FLOW
- A — DRAINAGE NODE POINT
- 648 — EXISTING CONTOUR

REVISIONS

DESCRIPTION	DATE

DRAINAGE AREA MAP FOR CHURCH OF CHRIST OF NEW BRAUNFELS

NEW BRAUNFELS, TEXAS

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100056-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

D-1

Tuesday, December 22, 2009, 10:54 AM
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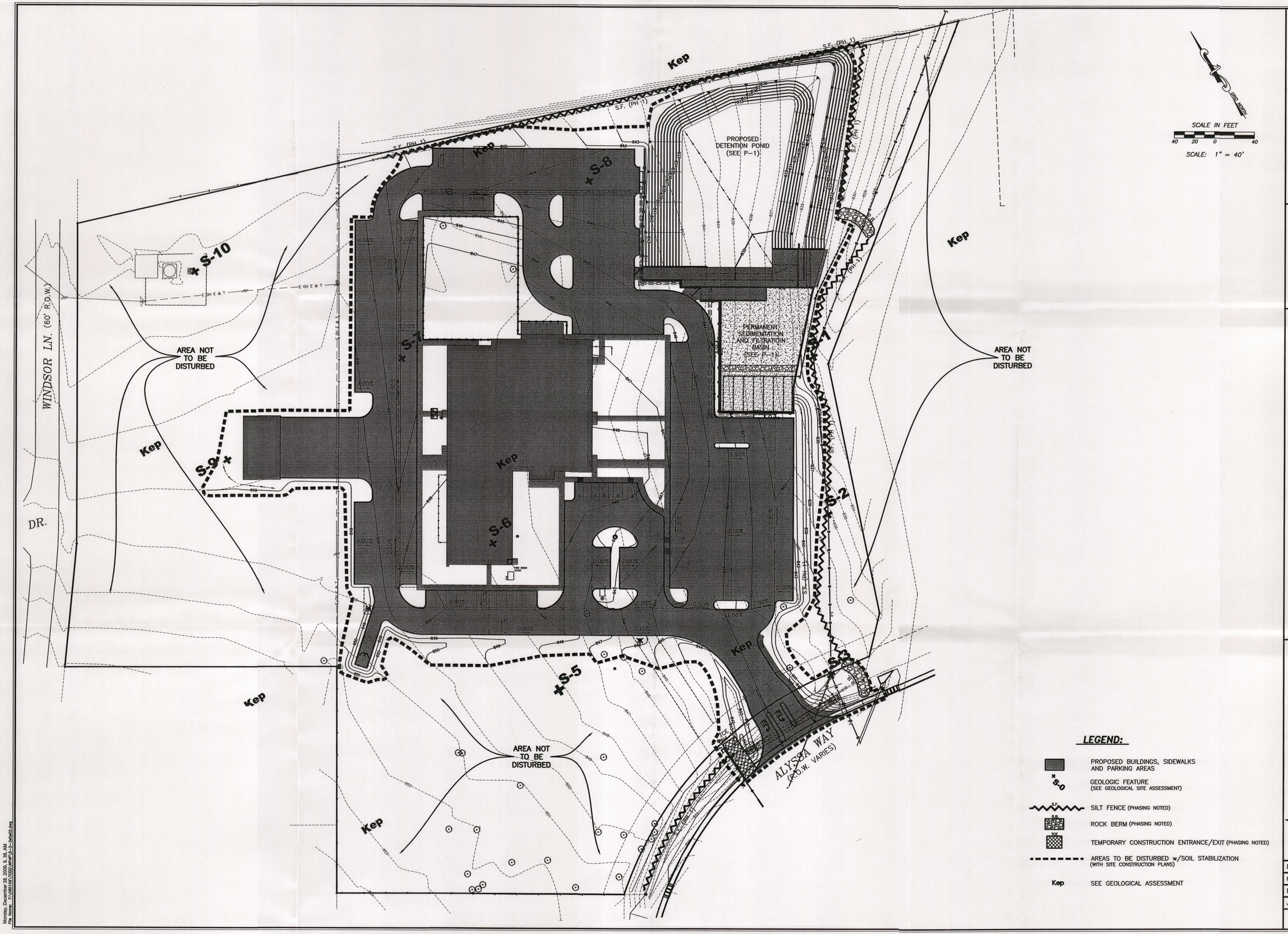


LEGEND:

- PROPOSED BUILDINGS, SIDEWALKS AND PARKING AREAS
- S-0 GEOLOGIC FEATURE (SEE GEOLOGICAL SITE ASSESSMENT)
- S.F. SILT FENCE (PHASING NOTED)
- R.B. ROCK BERM (PHASING NOTED)
- TEMPORARY CONSTRUCTION ENTRANCE/EXIT (PHASING NOTED)
- AREAS TO BE DISTURBED w/SOIL STABILIZATION (WITH SITE CONSTRUCTION PLANS)
- Kep SEE GEOLOGICAL ASSESSMENT

REVISIONS

DATE	DESCRIPTION

SITE PLAN (Phase 1)

CHURCH OF CHRIST OF NEW BRAUNFELS

NEW BRAUNFELS, TEXAS

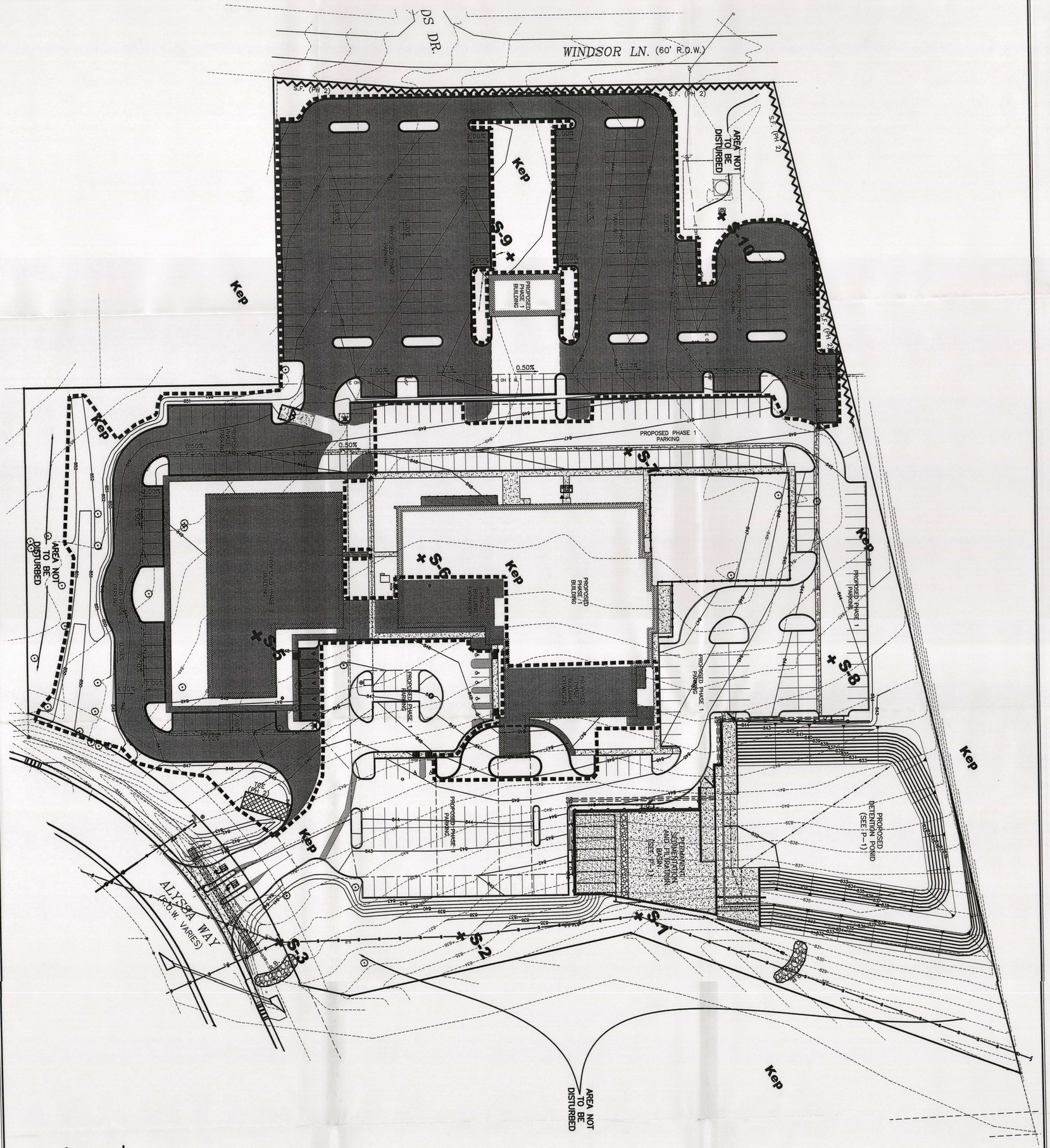
THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

S-2

Monday, December 28, 2009, 9:36 AM
File Name: F:\060109\TCEQ\WPAP\S-2-Site02.dwg

Monday, December 28, 2009, 9:37 AM
File Name: F:\080109\TCED\WPAP\S-2-3site02.dwg



LEGEND:

- PROPOSED BUILDINGS, SIDEWALKS AND PARKING AREAS
- S-5 GEOLOGIC FEATURE (SEE GEOLOGICAL SITE ASSESSMENT)
- SILT FENCE (PHASING NOTED)
- ROCK BERM (PHASING NOTED)
- TEMPORARY CONSTRUCTION ENTRANCE/EXIT (PHASING NOTED)
- AREAS TO BE DISTURBED w/SOIL STABILIZATION (WITH SITE CONSTRUCTION PLANS)
- Kep SEE GEOLOGICAL ASSESSMENT

SCALE: 1" = 40'
SCALE IN FEET
40 20 0 40

S-3

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 080109

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

SITE PLAN
(Phase 2)

CHURCH OF CHRIST OF NEW BRAUNFELS
NEW BRAUNFELS, TEXAS

STATE OF TEXAS
MICHAEL G. SHORT
89015
LICENSED
PROFESSIONAL ENGINEER
12-28-09

REVISIONS

DATE	DESCRIPTION

2377.03

TCEQ-R13
OCT 22 2009
SAN ANTONIO

NEW BRAUNFELS CHURCH OF CHRIST
WATER POLLUTION ABATEMENT PLAN

RECEIVED
OCT 26 2009
COUNTY ENGINEER

October 2009

Prepared for:

New Braunfels Church of Christ
1665 Business Loop 35 South
New Braunfels, TX 78130

Project No. 060109

Prepared By:

The Schultz Group Inc.
2461 Loop 337
New Braunfels, TX 78130
(830) 606-3913

Buddy Garcia, *Chairman*
Larry R. Soward, *Commissioner*
Bryan W. Shaw, Ph.D., *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

RECEIVED
OCT 28 2009
COUNTY ENGINEER

October 26, 2009

Mr. Thomas H. Hornseth, P.E.
Comal County Engineer
195 David Jonas Drive
New Braunfels TX 78132-3710

Re: Edwards Aquifer, Comal County
PROJECT NAME: New Braunfels Church of Christ, located at 1665 business loop 35 South, New Braunfels, Texas
PLAN TYPE: Application for Approval of a Water Pollution Abatement Plan (WPAP) 30 Texas Administration Code (TAC) Chapter 213; Edwards Aquifer Protection Program
EAPP File No.: 2377.03

Dear Mr. Hornseth:

The enclosed WPAP application received on October 22, 2009, is being forwarded to you pursuant to the Edwards Aquifer Rules. The Texas Commission on Environmental Quality (TCEQ) is required by 30 TAC Chapter 213 to provide copies of all applications to affected incorporated cities and underground water conservation districts for their comments prior to TCEQ approval.

Please forward your comments to this office by November 21, 2009.

The Texas Commission on Environmental Quality appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions regarding these matters, please feel free to contact the San Antonio Region Office at (210) 490-3096.

Sincerely

Lynn M. Bumguardner
Water Section Work Leader
San Antonio Regional Office

LMB/eg

Table of Contents

1. Water Pollution Abatement Plan Checklist
2. General Information Form
3. Geologic Assessment
4. Water Pollution Abatement Plan Application Form
5. Temporary Stormwater Section
6. Permanent Stormwater Section
7. Agent Authorization Form
8. Application Fee Form
9. Core Data Form
10. Reference

RECEIVED
OCT 2 8 2009
COUNTY ENGINEER

Water Pollution Abatement Plan Checklist

Water Pollution Abatement Plan Checklist

✓ General Information Form (*TCEQ-0587*)
- ATTACHMENT A - Road Map
- ATTACHMENT B - USGS / Edwards Recharge Zone Map
- ATTACHMENT C - Project Description

✓ Geologic Assessment Form (*TCEQ-0585*)
- ATTACHMENT A - Geologic Assessment Table (*TCEQ-0585-Table*)
- Comments to the Geologic Assessment Table
- ATTACHMENT B - Soil Profile and Narrative of Soil Units
- ATTACHMENT C - Stratigraphic Column
- ATTACHMENT D - Narrative of Site Specific Geology
- Site Geologic Map(s)
- Table or list for the position of features' latitude/longitude (if mapped using GPS)

✓ Water Pollution Abatement Plan Application Form (*TCEQ-0584*)
- ATTACHMENT A - Factors Affecting Water Quality
- ATTACHMENT B - Volume and Character of Stormwater
- ATTACHMENT C - Suitability Letter from Authorized Agent (if OSSF is proposed)
- ATTACHMENT D - Exception to the Required Geologic Assessment (if requesting an exception)
- Site Plan

✓ Temporary Stormwater Section (*TCEQ-0602*)
- ATTACHMENT A - Spill Response Actions
- ATTACHMENT B - Potential Sources of Contamination
- ATTACHMENT C - Sequence of Major Activities
- ATTACHMENT D - Temporary Best Management Practices and Measures
- ATTACHMENT E - Request to Temporarily Seal a Feature, if sealing a feature
- ATTACHMENT F - Structural Practices
- ATTACHMENT G - Drainage Area Map
- ATTACHMENT H - Temporary Sediment Pond(s) Plans and Calculations
- ATTACHMENT I - Inspection and Maintenance for BMPs
- ATTACHMENT J - Schedule of Interim and Permanent Soil Stabilization Practices

✓ Permanent Stormwater Section (*TCEQ-0600*)
- ATTACHMENT A - 20% or Less Impervious Cover Waiver, if project is multi-family residential, a school, or a small business and 20% or less impervious cover is proposed for the site
- ATTACHMENT B - BMPs for Upgradient Stormwater
- ATTACHMENT C - BMPs for On-site Stormwater
- ATTACHMENT D - BMPs for Surface Streams
- ATTACHMENT E - Request to Seal Features (if sealing a feature)
- ATTACHMENT F - Construction Plans
- ATTACHMENT G - Inspection, Maintenance, Repair and Retrofit Plan
- ATTACHMENT H - Pilot-Scale Field Testing Plan, if BMPs not based on *Complying with the Edwards Aquifer Rules: Technical Guidance for BMPs*
- ATTACHMENT I -Measures for Minimizing Surface Stream Contamination

✓ Agent Authorization Form (*TCEQ-0599*), if application submitted by agent

✓ Application Fee Form (*TCEQ-0574*)

✓ Check Payable to the "Texas Commission on Environmental Quality"

✓ Core Data Form (*TCEQ-10400*)

General Information Form

TC [illegible]13

OCT 22 2009

SAN ANTONIO

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

REGULATED ENTITY NAME: New Braunfels Church of Christ
COUNTY: Comal STREAM BASIN: Bleiders Creeek

EDWARDS AQUIFER: X RECHARGE ZONE
__ TRANSITION ZONE

PLAN TYPE: X WPAP __ AST __ EXCEPTION
__ SCS __ UST __ MODIFICATION

CUSTOMER INFORMATION

1. Customer (Applicant):

Contact Person: Glendon Eppler
Entity: New Braunfels Church of Christ
Mailing Address: 1665 Business Loop 35 South
City, State: New Braunfels, Texas Zip: 78130
Telephone: (830) 625-3520 FAX: _____

Agent/Representative (If any):

Contact Person: Michael G. Short, P.E.
Entity: The Schultz Group, Inc.
Mailing Address: 2461 Loop 337
City, State: New Braunfels, Texas Zip: 78130
Telephone: (830) 606-3913 FAX: (830)625-2204

2. X This project is inside the city limits of New Braunfels, Texas
__ This project is outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____.
__ This project is not located within any city's limits or ETJ.

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

North side of the intersection of State Hwy 46 and State Hwy 1863 in New Braunfels, Texas. Located approximately 1.5 miles west of Loop 337

4. X **ATTACHMENT A - ROAD MAP**. A road map showing directions to and the location of the project site is attached at the end of this form.

5. X **ATTACHMENT B - USGS / EDWARDS RECHARGE ZONE MAP**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached behind this sheet. The map(s) should clearly show:

X Project site.
X USGS Quadrangle Name(s).
X Boundaries of the Recharge Zone (and Transition Zone, if applicable).
X Drainage path from the project to the boundary of the Recharge Zone.

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

7. X **ATTACHMENT C - PROJECT DESCRIPTION**. Attached at the end of this form is a detailed narrative description of the proposed project.

8. Existing project site conditions are noted below:
__ Existing commercial site
__ Existing industrial site
__ Existing residential site
__ Existing paved and/or unpaved roads
__ Undeveloped (Cleared)
__ Undeveloped (Undisturbed/Uncleared)
X Other: Majority of the site is undeveloped (uncleared). A small portion of the site is developed.

PROHIBITED ACTIVITIES

9. 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 Chapter 331 of this title (relating to Underground Injection Control);
(2) new feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
(3) land disposal of Class I wastes, as defined in 30 TAC §335.1;
(4) the use of sewage holding tanks as parts of organized collection systems; and
(5) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

10. 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 Chapter 331 (relating to Underground Injection Control);
(2) land disposal of Class I wastes, as defined in 30 TAC §335.1; and
(3) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

ADMINISTRATIVE INFORMATION

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

X For a Water Pollution Abatement Plan and Modifications, the total acreage of the site where regulated activities will occur.

footage of all collection system lines.

__ For a UST Facility Plan or an AST Facility Plan, the total number of tanks or piping systems.

__ A Contributing Zone Plan.

__ A request for an exception to any substantive portion of the regulations related to the protection of water quality.

__ A request for an extension to a previously approved plan.

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

__ TCEQ cashier

__ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)

X San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

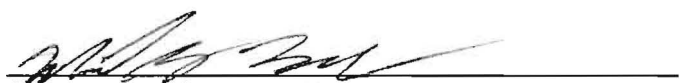
13. X Submit one (1) original and three (3) copies of the completed application to the appropriate regional office for distribution by the TCEQ to the local municipality or county, groundwater conservation districts, and the TCEQ's Central Office.

14. X No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the executive director.

__ No person shall commence any regulated activity until the Contributing Zone Plan for the activity has been filed with the executive director.

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

Michael G. Short, P.E.
Print Name of Customer/Agent

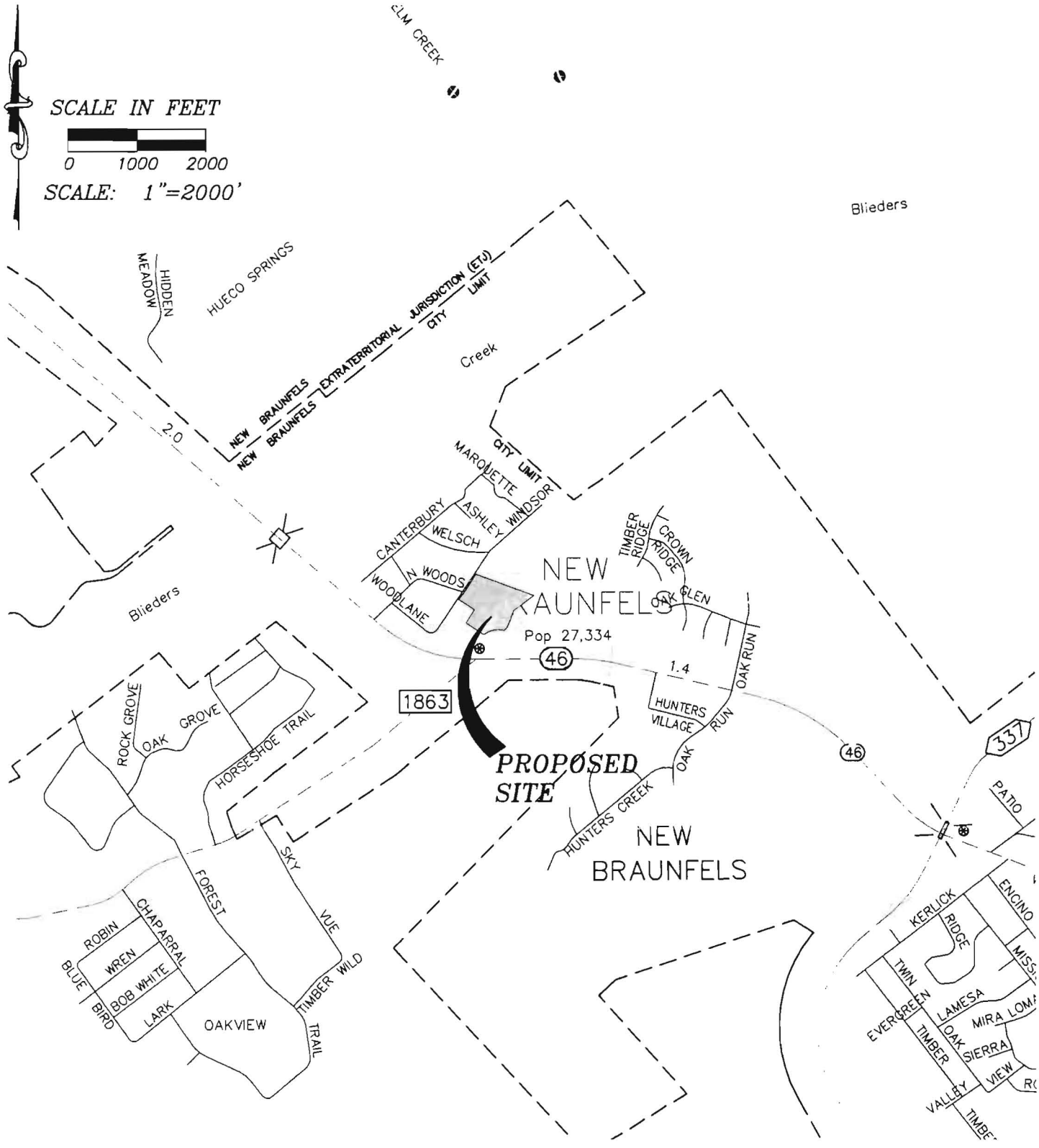


Signature of Customer/Agent

10/22/09
Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.



ATTACHMENT A
ROAD MAP

THE Schultz Group, INC.

CONSULTING ENGINEERS LAND SURVEYORS

P.O. BOX 310483 NEW BRAUNFELS, TEXAS 78131 (830) 606-3913

FAX (830) 625-2204

DRAWN BY: D.C.	DATE: JULY 2009
CHECKED BY: M.G.S.	JOB NO.: 060109

Edwards Aquifer Recharge Zone Map
30 Texas Administrative Code Chapter 213
Edwards Aquifer Authority Rule Chapter 713

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

NEW BRAUNFELS WEST QUADRANGLE
TEXAS
7.5 MINUTE SERIES (TOPOGRAPHIC)

NEW BRAUNFELS EAST QUADRANGLE
TEXAS
7.5 MINUTE SERIES (TOPOGRAPHIC)

PROPOSED SITE

Recharge Zone

Transition Zone

Recharge

NEW BRAUNFELS

Produced by the United States Geological Survey
Revised in cooperation with the Texas Water Development Board

Control by USGS, NOS/NOAA, and USCE

Compiled by the Army Map Service by photogrammetric methods from aerial photographs taken 1956. Field checked 1958
Revised from aerial photographs taken 1986. Field checked 1987
Map edited 1988

Projection and 10,000-foot grid ticks: Texas coordinate system, south central zone (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid, zone 14
1927 North American Datum
To place on the predicted North American Datum 1983 move the projection lines 20 meters south and 28 meters east as shown by dashed corner ticks

Fine red dashed lines indicate selected fence and field lines generally visible on aerial photographs. This information is unchecked

UTM GRID AND 1988 MAGNETIC NORTH DECLINATION AT CENTER OF MAP DIAGRAM IS APPROXIMATE

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

2998-413

ROAD CLASSIFICATION

Primary highway, hard surface — Light-duty road, hard or improved surface
Secondary highway, hard surface — Unimproved road
Interstate Route · U. S. Route · State Route

NEW BRAUNFELS WEST, TEX.
29098-F2-TF-024
1988
DMA 6343 II NW-SERIES V822

NEW BRAUNFELS EAST, TEX.
29098-F1-TF-024
1988
REVISED 1994
DMA 6343 II NE-SERIES V822

ATTACHMENT B
USGS/EDWARDS RECHARGE ZONE MAP

Last revision date of the Recharge Zone Boundary for this Quadrangle Map: March 1974

Attachment C – Project Description

It is proposed that the New Braunfels Church of Christ be an 11.58 acre developed constructed in two phases.

Phase 1 will consist of 2.49 acres of parking, 0.17 acres of miscellaneous concrete, 0.63 acres of rooftops and building square footage, and 0.20 acres of concrete sidewalks. The parking lot will include minimal landscaping islands and buffer areas. The parking lot will be graded to drain all onsite flows to a proposed sand filter system and detention pond. The sand filter system and detention pond will be constructed as part of Phase 1 and will be adequately sized to handle flows for Phase 1 and Phase 2.

Phase 2 will include expansions of all facilities. Proposed impervious cover for both Phase 1 and Phase 2 will consist of 5.03 acres of parking, 0.18 acres of miscellaneous concrete, 1.25 acres of rooftops and building square footage, and 0.28 acres of concrete sidewalks. All expansions will be graded to the sedimentation and detention pond constructed in Phase 1.

Summary of project areas are as follows:

Phase 1

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	27,458	÷ 43,560 =	0.63
Parking	108,420	÷ 43,560 =	2.49
Other paved surfaces	16,173	÷ 43,560 =	0.37
Total Impervious Cover	152,051	÷ 43,560 =	3.49
Total Impervious Cover ÷ Total Acreage x 100 =			30.14%

Phase 2

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	54,552	÷ 43,560 =	1.25
Parking	219,278	÷ 43,560 =	5.03
Other paved surfaces	20,255	÷ 43,560 =	0.46
Total Impervious Cover	294,085	÷ 43,560 =	6.74
Total Impervious Cover ÷ Total Acreage x 100 =			58.20%

Geologic Assessment

Geologic Site Assessment (WPAP)

for Regulated Activities / Development
on the Edwards Aquifer Recharge / Transition Zone

The New Braunfels Church of Christ
11.306 Acres
New Braunfels, Texas

FROST GEOSCIENCES CONTROL # FGS-E09139

JULY 31, 2009

Prepared exclusively for

New Braunfels Church of Christ
c/o The Schultz Group, Inc.
2461 Loop 337
New Braunfels, Texas 78130

Frost GeoSciences

Geologic and Environmental Consulting

13402 Western Oak • Helotes, Texas 78023 • Phone: (210) 372-1315 • Fax: (210) 372-1318

Frost GeoSciences
Geologic and Environmental Consulting

13402 Western Oak
Helotes, Texas 78023
Phone (210) 372-1315
Fax (210) 372-1318
www.frostgeosciences.com

Steve Frost, C.P.G., P.G.

July 31, 2009

New Braunfels Church of Christ
c/o The Schultz Group, Inc.
2461 Loop 337
New Braunfels, Texas 78130

Attn: Mr. Shawn T. Schorn, E.I.T.

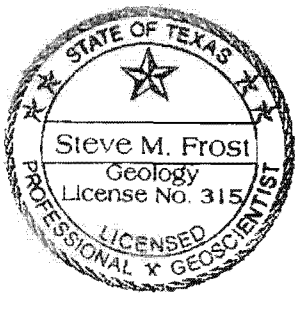
Re: Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
11.306 Acres
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-E09139

Gentlemen:

Attached is a copy of the Geologic Assessment Report completed for the above referenced project site as it relates to 30 TAC §213.5(b)(3), effective June 1, 1999. Our investigation was conducted, and this report was prepared in general accordance with the "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-01-04). The results of our investigation along with any required recommendations for Best Management Practices (BMP's) are provided in the following report.

If you have any questions regarding this report, or if Frost GeoSciences, Inc. may be of additional assistance to you on this project, please feel free to call our office. It has been a pleasure to work with you and we wish to thank you for the opportunity to be of service to you on this project. We look forward to being of continued service.



Sincerely,
Frost GeoSciences, Inc.

Steve Frost, C.P.G., P.G.
President, Senior Geologist

Distribution: (5) The Schultz Group

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APPENDIX

A: Plate 1: Site Plan
Plate 2: Street Map
Plate 3: U.S.G.S. Topographic Map
Plate 4: Official Edwards Aquifer Recharge Zone Map
Plate 5: FEMA Flood Map
Plate 6: U.S. Geological Survey, Water Resources Investigation # 94-4117
Plate 7: 2009 Aerial Photograph, 1"=500'
Plate 8: 2009 Aerial Photograph with PRF's, 1"=200'
Plate 9: 1973 Photograph, 1"=500'

B: Site Photographs

C: Site Geologic Map

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

REGULATED ENTITY NAME: The New Braunfels Church of Christ - 11.306 Acres

TYPE OF PROJECT: ✓ WPAP . __ AST __ SCS __ UST

LOCATION OF PROJECT: ✓ Recharge Zone __ Transition Zone __ Contributing Zone within the Transition Zone

PROJECT INFORMATION

1. ✓ Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE.**

2. Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (*Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A*, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
Rumple-Comfort Assoc.	C/D	0.5 to 2

* Soil Group Definitions (Abbreviated)

A. Soils having a high infiltration rate when thoroughly wetted.

B. Soils having a moderate infiltration rate when thoroughly wetted.

C. Soils having a slow infiltration rate when thoroughly wetted.

D. Soils having a very slow infiltration rate when thoroughly wetted

3. ✓ A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column.

4. ✓ A **NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY** is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site.

5. ✓ Appropriate **SITE GEOLOGIC MAP(S)** are attached:

The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1" : 400'

Applicant's Site Plan Scale	1" = 40 '
Site Geologic Map Scale	1" = 40 '
Site Soils Map Scale (if more than 1 soil type)	1" = 500 '

6. ✓ Method of collecting positional data:
Global Positioning System (GPS) technology.

✓ Other method(s). 2009 Aerial Photograph

7. ✓ The project site is shown and labeled on the Site Geologic Map.

8. ✓ Surface geologic units are shown and labeled on the Site Geologic Map.

9. ✓ 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.

10. ✓ The Recharge Zone boundary is shown and labeled, if appropriate.

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

✓ 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.
___ The wells are in use and comply with 16 TAC §76.
___ There are no wells or test holes of any kind known to exist on the project site.

ADMINISTRATIVE INFORMATION

12. ✓ Five (5) originals of the completed assessment have been provided.

Date(s) Geologic Assessment was performed: July 28, 2009
Date(s)

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

Steve Frost, C.P.G., P.G.
Print Name of Geologist

(210) 372-1315
Telephone

(210) 372-1318
Fax

Signature of Geologist

July 31, 2009
Date

STATE OF TEXAS
Steve M. Frost
Geology
License No. 315
LICENSED PROFESSIONAL GEOSCIENTIST

Representing: Frost GeoSciences, Inc.
(Name of Company)

If you have questions on how to fill out this form or about the Edwards Aquifer Protection Program, please contact us at 512/939-2929 (Austin) or 210/403-4024 (San Antonio)

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282

Stratigraphic Column

[Hydrogeologic subdivisions modified from Maclay and Small (1976); groups, formations, and members modified from Rose (1972); lithology modified from Dunham (1962); and porosity type modified from Choquette and Pray (1970). CU, confining unit; AQ, aquifer]

Hydrogeologic subdivision			Group, formation, or member			Hydrologic function	Thickness (feet)	Lithology	Field identification	Cavern development	Porosity/ permeability type
Upper Cretaceous	Upper confining units		Eagle Ford Group			CU	30 – 50	Brown, flaggy shale and argillaceous limestone	Thin flagstones; petroliferous	None	Primary porosity lost/ low permeability
			Buda Limestone			CU	40 – 50	Buff, light gray, dense mudstone	Porcelaneous limestone with calcite-filled veins	Minor surface karst	Low porosity/low permeability
			Del Rio Clay			CU	40 – 50	Blue-green to yellow-brown clay	Fossiliferous; *Hymatogyra arietina*	None	None/primary upper confining unit
Lower Cretaceous	I	Edwards aquifer	Georgetown Formation			Karst AQ; not karst CU	2 – 20	Reddish-brown, gray to light tan marly limestone	Marker fossil; *Waconella wacoensis*	None	Low porosity/low permeability
	II		Edwards Group	Person Formation	Cyclic and marine members, undivided	AQ	80 – 90	Mudstone to packstone; *miliolid* grainstone; chert	Thin graded cycles; massive beds to relatively thin beds; crossbeds	Many subsurface; might be associated with earlier karst development	Laterally extensive; both fabric and not fabric/water-yielding
	III				Leached and collapsed members, undivided	AQ	70 – 90	Crystalline limestone; mudstone to grainstone; chert; collapsed breccia	Bioturbated iron-stained beds separated by massive limestone beds; stromatolitic limestone	Extensive lateral development, large rooms	Majority not fabric/one of the most permeable
	IV				Regional dense member	CU	20 – 24	Dense, argillaceous mudstone	Wispy iron-oxide stains	Very few; only vertical fracture enlargement	Not fabric/low permeability; vertical barrier
	V			Kainer Formation	Grainstone member	AQ	50 – 60	*Miliolid* grainstone; mudstone to wackestone; chert	White crossbedded grainstone	Few	Not fabric/ recrystallization reduces permeability
	VI				Kirschberg evaporite member	AQ	50 – 60	Highly altered crystalline limestone; chalky mudstone; chert	Boxwork voids, with neospar and travertine frame	Probably extensive cave development	Majority fabric/one of the most permeable
	VII				Dolomitic member	AQ	110 – 130	Mudstone to grainstone; crystalline limestone; chert	Massively bedded light gray, *Toucasia* abundant	Caves related to structure or bedding planes	Mostly not fabric; some bedding plane-fabric/water-yielding
	VIII				Basal nodular member	Karst AQ; not karst CU	50 – 60	Shaly, nodular limestone; mudstone and *miliolid* grainstone	Massive, nodular and mottled, *Exogyra texana*	Large lateral caves at surface; a few caves near Cibolo Creek	Fabric; stratigraphically controlled/large conduit flow at surface; no permeability in subsurface
	Lower confining unit		Upper member of the Glen Rose Limestone			CU; evaporite beds AQ	350 – 500	Yellowish tan, thinly bedded limestone and marl	Stair-step topography; alternating limestone and marl	Some surface cave development	Some water production at evaporite beds/relatively impermeable

GEOLOGIC ASSESSMENT TABLE | PROJECT NAME: The New Braunfels Church of Christ - 11.306 Acres FGS-E09139

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B*	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	> 40	<1.6	>1.6	
S-1	N29° 43' 23.2"	W98° 10' 33.7"	MB	30	Kcp	3	3	-	-	-	-	-	X	9	39	39			Yes	Drainage
S-2	N29° 43' 21.7"	W98° 10' 34.5"	MB	30	Kcp	3	3	-	-	-	-	-	X	9	39	39			Yes	Drainage
S-3	N29° 43' 20.5"	W98° 10' 35.2"	MB	30	Kcp	3	3	-	-	-	-	-	X	9	39	39			Yes	Drainage
S-5	N29° 43' 21.6"	W98° 10' 38.0"	CD	5	Kcp	40	50	3	-	-	-	-	N/C/O	13	18	18		Yes		Hillside
S-6	N29° 43' 23.2"	W98° 10' 37.7"	SC	20	Kcp	1	1	1.5	-	-	-	-	O/F	13	33	33		Yes		Hillside
S-7	N29° 43' 25.2"	W98° 10' 37.4"	CD	5	Kcp	8	12	2	-	-	-	-	N/C/O	13	18	18		Yes		Hillside
S-8	N29° 43' 25.6"	W98° 10' 34.9"	CD	5	Kcp	10	12	1.5	-	-	-	-	N/C/O	13	18	18		Yes		Hillside
S-9	N29° 43' 25.2"	W98° 10' 39.7"	SC	20	Kcp	0.5	1	0.5	-	-	-	-	O/F	13	33	33		Yes		Hillside
S-10	N29° 43' 27.0"	W98° 10' 38.8"	MB	30	Kcp	0.5	0.5	360	-	-	-	-	N	40	70		70	Yes		Hillside

* DATUM 1927 North American Datum (NAD27)

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution Cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow Hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by 30 TAC 213.



Signature _____ Date July 31, 2009 Sheet 1 of 1

LOCATION

The project site is located along and north of Alyssa Way north of the intersection of State Highway 46 at the intersection of F.M. 1863 in New Braunfels, Texas. An overall view of the area is shown on copies of the site plan, a street map, the U.S.G.S. Topographic Map, the Edwards Underground Water District Reference Map, the FIRM Map, a geologic map, a 2009 Aerial Photograph at a scale of 1"=500', a 2009 Aerial Photograph at a scale of 1"=200', and a 1973 Photograph at a scale of 1"=500', Plates 1, 2, 3, 4, 5, 6, 7, 8, and 9 in Appendix A.

METHODOLOGY

The Geologic Assessment was conducted by Mr. Steve Frost, C.P.G., P.G., President and Senior Geologist, and Ms. T.G. Bey, Field Technician, with Frost GeoSciences, Inc. Mr. Frost is a Licensed Professional Geoscientist in the State of Texas (License # 315), and is a Certified Professional Geologist with the American Institute of Professional Geologist (Certification # 10176).

Frost GeoSciences, Inc. researched the geology of the area near the intersection of F.M. 1863 and State Highway 46. The research included, but was not limited to, the Bureau of Economic Geology, Geologic Atlas of Texas, San Antonio Sheet, FEMA maps, Edwards Aquifer Recharge Zone Maps, U.S.G.S. 7.5 Minute Quadrangle Maps, the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, the U.S.G.S. Water-Resources Investigations Report 94-4117, and the U.S.D.A. Soil Survey of Comal & Hays Counties, Texas.

After reviewing the available information, a field investigation was performed to identify any geologic or man made potential recharge features. A transect spacing of approximately 50 feet, or less depending on vegetation thickness, was used to inspect the project area. A 2009 aerial photograph, in conjunction with a hand held Garmin eTrex Summit Global Positioning System with an Estimated Potential Error ranging from 12 to 15 feet, was used to navigate around the property and identify the locations of potential recharge features, as recommended in the "Instructions to Geologists", TCEQ-0585-Instructions (Rev.

10-1-04). The locations of any potential recharge features noted in the field were marked with white flagging. The flagging is numbered with the same potential recharge feature I.D. # that is used on the Site Geologic Map in Appendix C of this report. The Site Geologic Map indicating the limits of the project site and the locations of potential recharge features is included in Appendix C. A copy of a 2009 Aerial Photograph at an approximate scale of 1"=200' indicating the limits of the project site and the locations of potential recharge features is included on Plate 8 in Appendix A. The Geologic Assessment Form, Stratigraphic Column, and the Geologic Assessment Table have been filled with the appropriate information for this project site and are included on pages 1-4 of this report.

RESEARCH & OBSERVATIONS

7.5 Minute Quadrangle Map Review

According to the U.S.G.S. 7.5 Minute Quadrangle Map, New Braunfels West, Texas Sheet (1988), the elevation across the project site ranges from 830 near the northeastern property corner to near 860 feet along Windsor Lane. The project site has a total relief of approximately 30 feet. Runoff from the project site flows to the northeast into an unnamed tributary of Blieders Creek. State Highway 46 is located south of the project site. F.M. 1863 is located south of the project site across State Highway 46. Areas of residential development are located north, south, and west of the project site. Mission Hill is located southeast of the project site. A copy of the U.S.G.S. 7.5 Minute Quadrangle Map indicating the location of the project site is included on Plate 3 in Appendix A.

Recharge / Transition Zone

According to the Official Edwards Aquifer Recharge Zone Map, New Braunfels West, Texas Sheet (1988), the project site is located within the Recharge Zone of the Edwards Aquifer. A copy of the Official Edwards Aquifer Recharge Zone Map indicating the location of the project site is included on Plate 4 in Appendix A.

100-Year Floodplain

According to the Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) Panel # 48091C0435F, revised 09-02-09, the project site is located within Zone X. According to the Panel Legend, Zone X represents areas determined to be outside the 0.2% annual chance floodplain. A copy of the above referenced FIRM panel indicating the location of the project site is included on Plate 5 in Appendix A.

Soils

According to the United States Department of Agriculture, Soil Conservation Service, Soil Survey of Comal & Hays Counties, Texas, (1973), the project site is located on the Rumple-Comfort Association (RUD). A copy of the 1973 aerial photograph (approximate scale: 1"=500') from the U.S.D.A. Soil Survey of Comal & Hays Counties, Texas indicating the location of the project site and the soil types is included on Plate 9 in Appendix A.

The Rumple-Comfort Association consists of shallow and moderately deep soils on uplands in the Edwards Plateau Land Resource Area. The surface layer of the Rumple Soil is dark reddish brown very cherty clay loam about 10 inches thick. Rounded chert and limestone cobbles and gravel cover about 20 percent of the surface. The subsoil to a depth of 14 inches is dark reddish-brown very cherty clay, and to a depth of 28 inches it is dark reddish-brown extremely stony clay. The underlying material is indurated fractured limestone. The Comfort Soil is dark brown, neutral, extremely stony clay about 7 inches thick. The subsoil to a depth of 12 inches is dark reddish-brown, mildly alkaline, extremely stony clay. The underlying material is indurated fractured limestone. The soil is noncalcareous throughout. The soils in this association are well drained. Surface runoff is medium, but varies due to the occurrence of caves, fracture zones, and sinks. Permeability is moderately slow. Water erosion is a moderate hazard. This soil has a U.S.D.A. Texture Classification of very cherty clay loam, stony clay, very stony clay, extremely stony clay, and weathered bedrock. The Unified Classification is GC, CL or SC. The AASHO Classification is A-2-6, A-6, and A-2-7. This soil has an average permeability from 0.2 to 0.6 inches/hour.

Narrative Description of the Site Geology

Based on a visual inspection of the ground surface, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to range from low to high.

Two natural karst features, three non-karst closed depressions, and four man-made features were noted on the project site at the time of the field investigation on July 28, 2009. The locations of the Potential Recharge Features are identified on the Site Plan on Plate 1 in Appendix A, on the 2009 aerial photograph on Plate 8 in Appendix A, and on the Site Geologic Map provided in Appendix C. Color photographs of the project site and some of the potential recharge features are included in Appendix B.

Potential Recharge Features S-1, S-2, and S-3 are man-made feature in bedrock consisting of existing sanitary sewer manhole covers. Frost GeoSciences, Inc. rates these features as low on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). These features score a 39 on the sensitivity scale in column 10 of the Geologic Assessment Table on Page 4 of this report.

Potential Recharge Features S-5, S-7, and S-8 are low lying depressed areas that appear to have been created by an old episode of bulldozing on the property. It is strongly suspected that these low lying areas are the result of removing trees, and/or boulders. Numerous small outcrops of weathered gray limestone with tan chips from bulldozer scabs were noted across the central, western and northern portions of the project site. Several areas of bulldozed topsoil mixed with brush were also noted on the property. Frost GeoSciences, Inc. rates these features as low on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). These features score a 18 on the sensitivity scale in column 10 of the Geologic Assessment Table on Page 4 of this report.

Potential Recharge Features S-6 and S-9 consist of solution cavities of various sizes. These were filled in with loose leaves and limestone rubble with dense soil at the base of the features. A machete was used to probe the depths of these features. Frost GeoSciences,

Inc. rates these features as low on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). These features score a 33 on the sensitivity scale in column 10 of the Geologic Assessment Table on Page 4 of this report.

Feature S-10 is a man-made feature in bedrock that consists of a water well. According to research and information provided by the civil engineer, this well is classified by the Texas Water Development Board (TWDB) as well no. 6823317. This well was operated from at least 1979 until 1998 to supply water to the Northwoods Subdivision when New Braunfels Utilities (NBU) purchased the well in late 1998. Under direction from the Edwards Aquifer Authority, the Church of Christ of New Braunfels contracted to have the tubing and pump removed and had Geo Cam log and videotape the well. It is currently pending whether or not to plug the well or simply cap it. Frost GeoSciences, Inc. rates this feature as high on Figure 1 of the TCEQ-0585-Instructions (Rev. 10-01-04). These features score a 18 on the sensitivity scale in column 10 of the Geologic Assessment Table on Page 4 of this report.

The property exists as undeveloped land. The project site supports a moderate to dense stand of vegetative cover with a moderate to dense stand of grasses. Overall vegetation on the project site consists of ashe juniper (*Juniperus ashei*), Cedar Elm (Ulmus crassifolia), Mesquite (Prosopis l.), hackberry (Celtis sp.), China Berry (*Melia azadarach L.*), and live oak (*Quercus virginiana*), with Texas persimmon (*Diospyros texana*), Sotol (*Dasylirion Zucc.*), agarita (*Berberis trifoliolata*), and huisache (Acacia farnesiana).

According to the site plan provided by The Schultz Group, the surveyed elevations on the project site range from 826 feet near the northeastern property corner to 854 feet near the southwestern corner of the project site. A copy of the site plan indicating the boundary of the project site and the elevations is included on the Site Plan on Plate 1 in Appendix A and the Site Geologic Map in Appendix C of this report.

The project site was covered by a notably thick soil layer with well developed native grass cover. Small scattered limestone outcrops with bulldozer scars were noted in the central, western, and northern portions of the project site.

According to the U.S. Geological Survey Water Resources Investigations 94-4117, the project site is located on the Cyclic and Marine Member and the Leached and Collapsed Member of the Cretaceous Edwards Person Limestone.

The Cyclic and Marine Member of the Edwards Person Limestone consists of mudstone to packstone with milliolid grainstone and chert. This member occurs as thin graded cycles of massive to relatively thin beds with some crossbeds. Typically, cavern development in this member is common, but occurs mainly in the subsurface. The caverns within this member might be associated with earlier episodes of karst development.

The Leached and Collapsed Member of the Edwards Person Limestone consists of crystalline limestone, mudstone to grainstone with chert, and collapsed breccia. This member is stromatolitic limestone. The Leached and Collapsed Member is characterized by bioturbated iron stained beds separated by massive limestone beds. This member is typically one of the most permeable and has extensive lateral development with large rooms. Overall thickness ranges from 70 to 90 feet thick.

A copy of the U.S.G.S. Water Resources Investigation 94-4117 indicating the location of the project site is included on Plate 6 in Appendix A.

BEST MANAGEMENT PRACTICE (BMP)

Based on a visual inspection of the ground surface and the research performed for this project, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to range from low to high. The potential always exists to encounter subsurface features that lack a surface expression. Frost GeoSciences, Inc. recommends that we be included in the pre-construction meeting to inform construction personnel of the potential to encounter subsurface karst features during excavating activities. Construction personnel should also be informed of the proper protocol to follow in the event that a solution cavity and/or cave is encountered during the excavation and development of the property.

DISCLAIMER

This report has been prepared in general accordance with the "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-1-04) by a Licensed Texas Professional Geoscientist. All areas of the project site were carefully inspected for features that could contribute to the recharge of the Edwards Aquifer, however, this survey cannot preclude the presence of subsurface karst features that lack surface expression. This report is not intended to be a definitive investigation of all possible geologic or karst features at this site. All conclusions, opinions, and recommendations for Best Management Practices (BMP's) in this report are based on information obtained while researching the project, and on the site conditions at the time of our field investigation.

This report has been prepared for the exclusive use of the New Braunfels Church of Christ and The Schultz Group. This report is based on available known records, a visual inspection of the project site, and the work generally accepted for a Geologic Assessment for Regulated Activities / Developments on the Edwards Aquifer Recharge / Transition Zone, relating to 30 TAC §213.5(b)(3), effective June 1, 1999.

REFERENCES

1) U.S.G.S. 7.5 Minute Quadrangle Map, New Braunfels West, Texas Sheet (1988).

2) Official Edwards Aquifer Recharge Zone Map, New Braunfels West, Texas Sheet (1996).

3) Small, Ted A., and Hanson, John A., 1994, Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Comal County, Texas. U.S. Geological Survey Water Resources Investigations 94-4117.

4) Barnes, V.L., 1983, Geologic Atlas of Texas, San Antonio Sheet, Bureau of Economic Geology, The University of Texas at Austin, Texas.

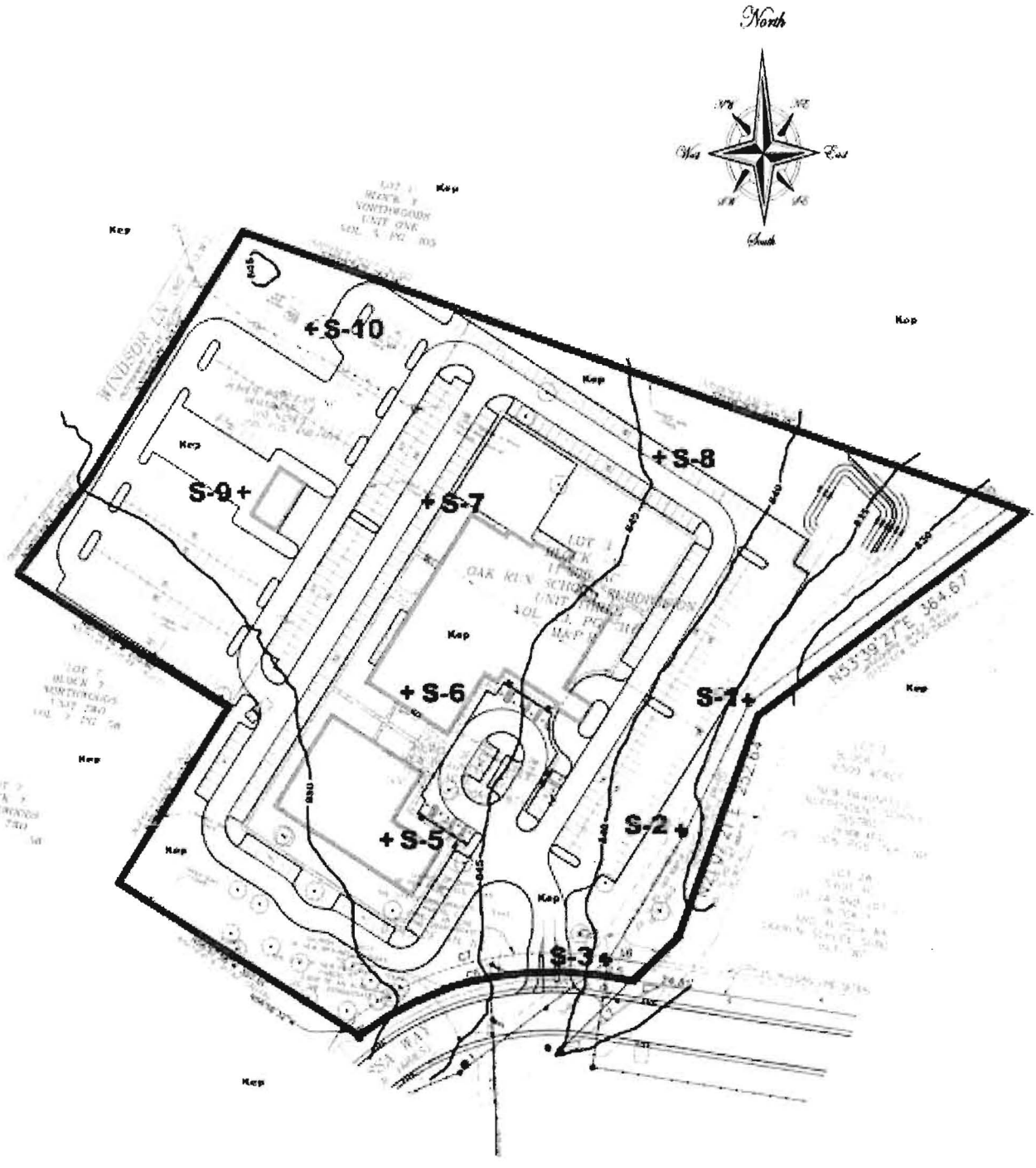
5) Federal Emergency Management Agency (FEMA), September 2, 2009, Comal County, Texas and Incorporated Areas, Flood Insurance Rate Map (FIRM), Panel #48091C0435F FEMA, Washington D.C.

6) U.S.D.A. Soil Conservation Service. Soil Survey of Comal & Hays Counties, Texas (1973).

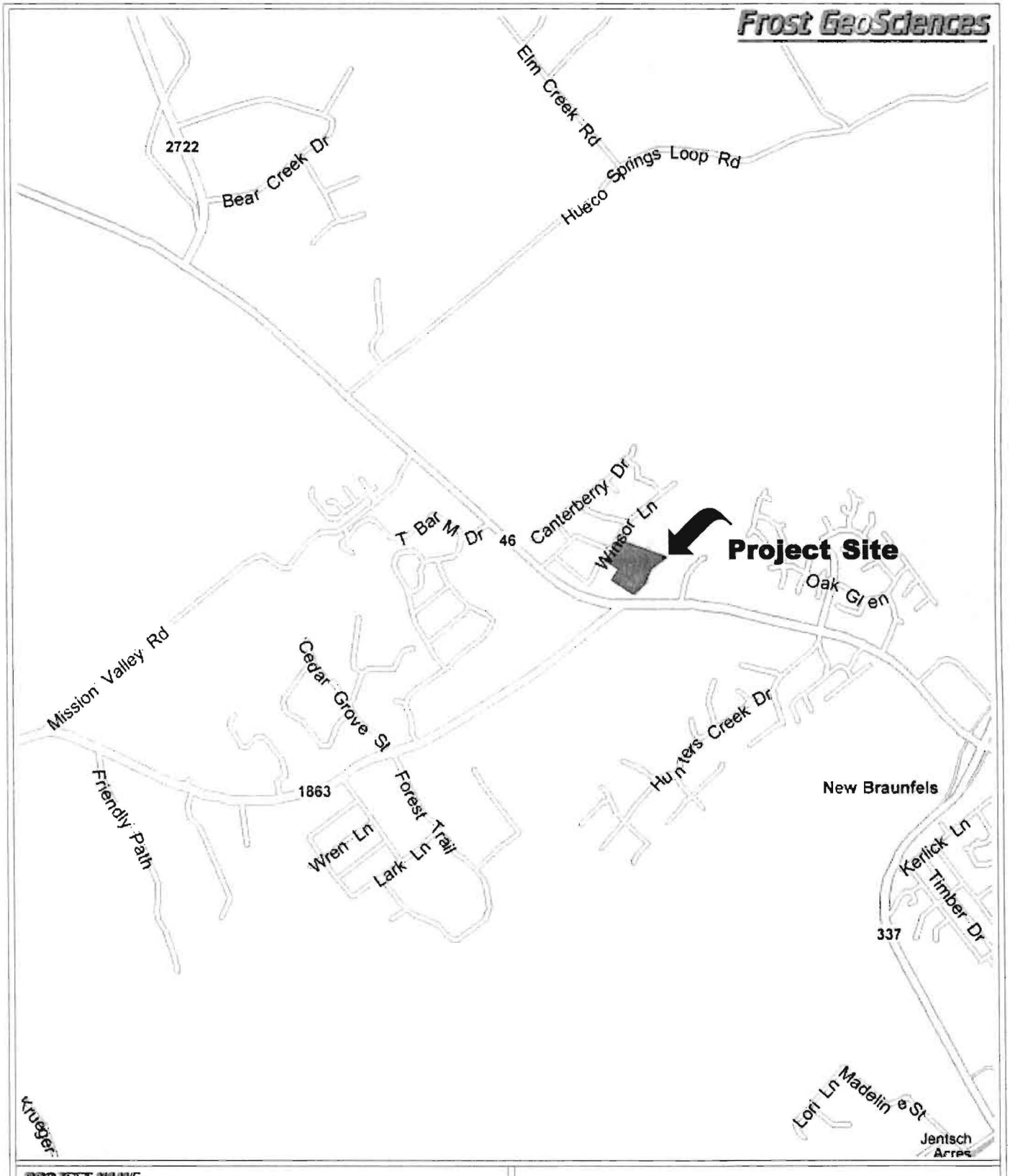
7) TCEQ-0585-Instructions (Rev. 10-1-04). "Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone".

8) Collins, Edward, W., 2000, Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, Bureau of Economic Geology, The University of Texas at Austin, Texas.

Frost GeoSciences



PROJECT NAME:	Site Plan	
Geologic Site Assessment (WPAP) for Regulated Activities / Development on the Edwards Aquifer Recharge / Transition Zone The New Braunfels Church of Christ New Braunfels, Texas	PROJECT NO.: FGS-E09139	DATE: July 31, 2009

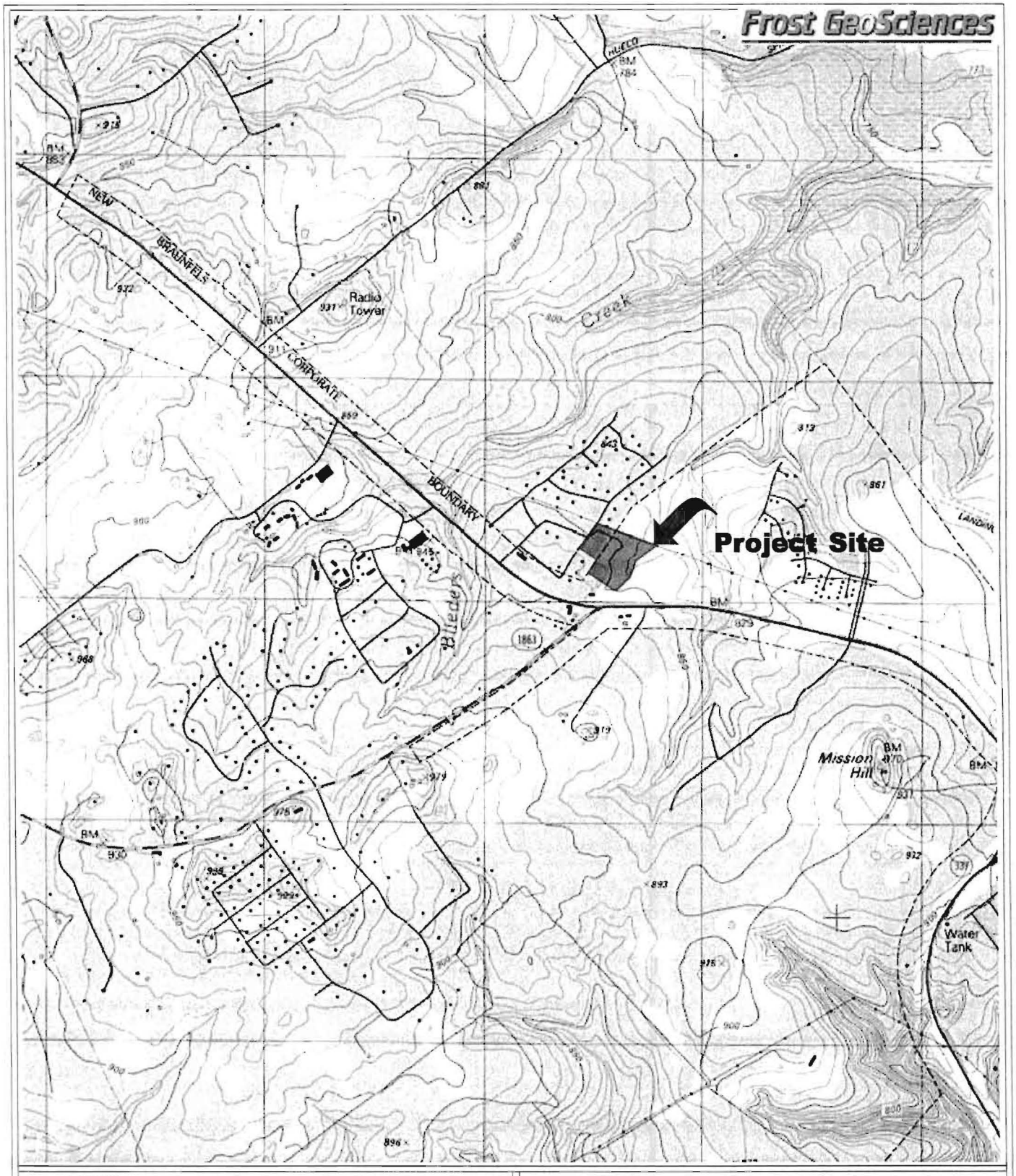


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

Street Map

PROJECT NO.: FGS-E09139

DATE: July 31, 2009



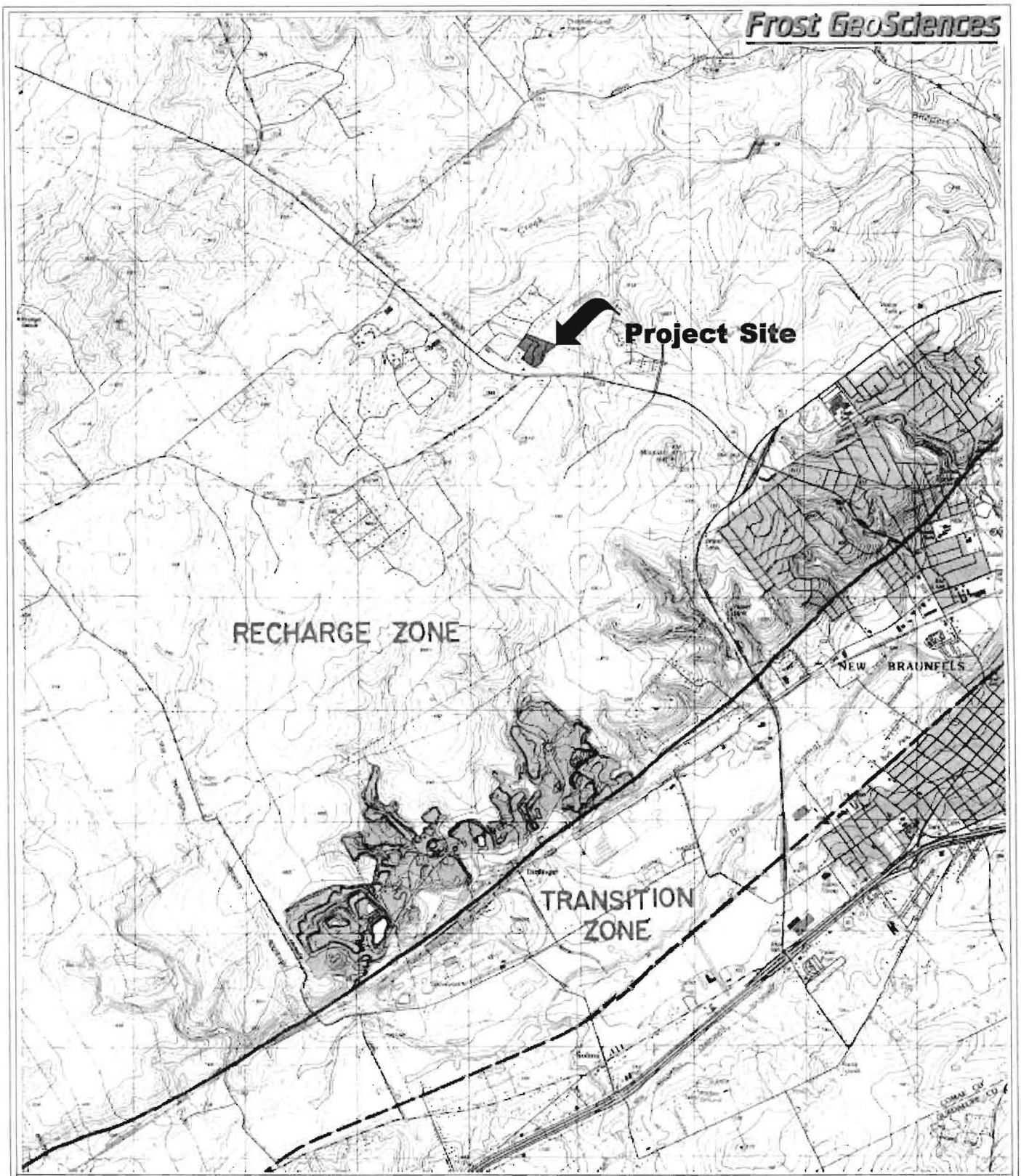
PROJECT NAME:

Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

U.S.G.S. 7.5 Minute Quadrangle Map
New Braunfels West, Texas Sheet (1988)

PROJECT NO.:	DATE:
FGS-E09139	July 31, 2009

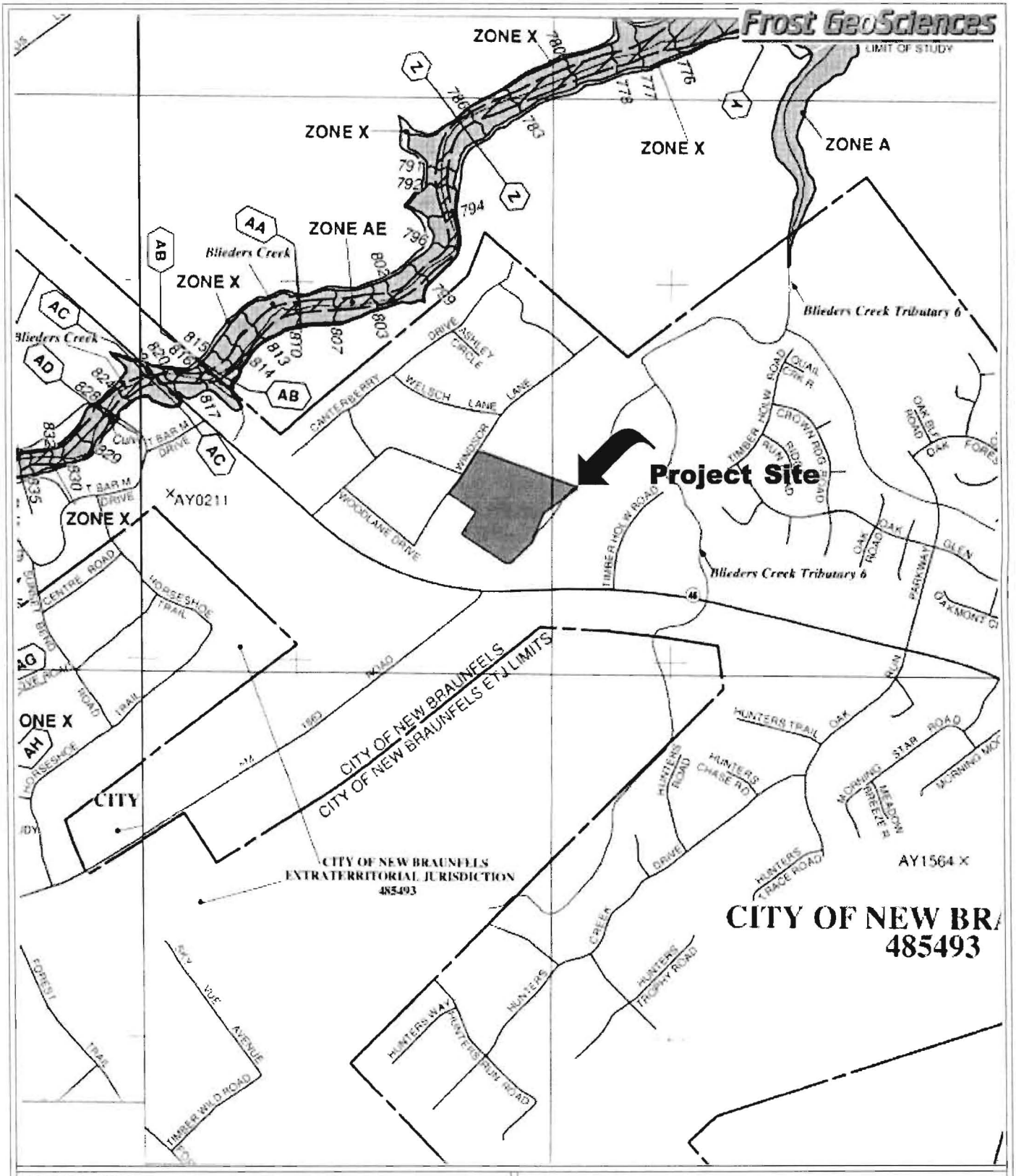
Frost GeoSciences



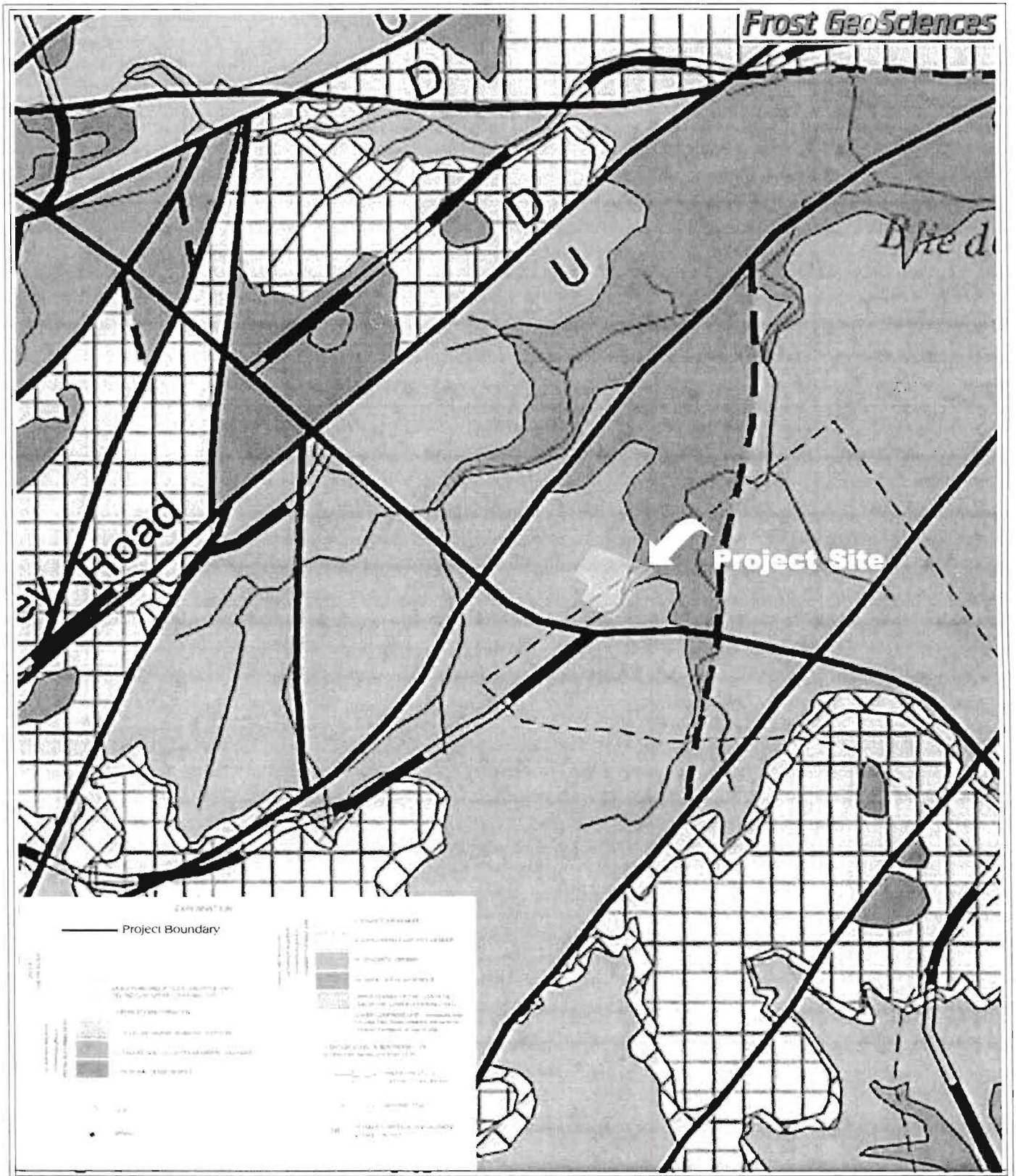
PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

Official Edwards Aquifer Recharge Zone Map
New Braunfels West, Texas Sheet 1988

PROJECT NO.:	DATE:
FGS-E09139	July 31, 2009



PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities / Development on the Edwards Aquifer Recharge / Transition Zone The New Braunfels Church of Christ New Braunfels, Texas	Flood Insurance Rate Map (FIRM) Community Panel 48091C0435F (9-02-09)
PROJECT NO.: FGS-E09139	**DATE:** July 31, 2009

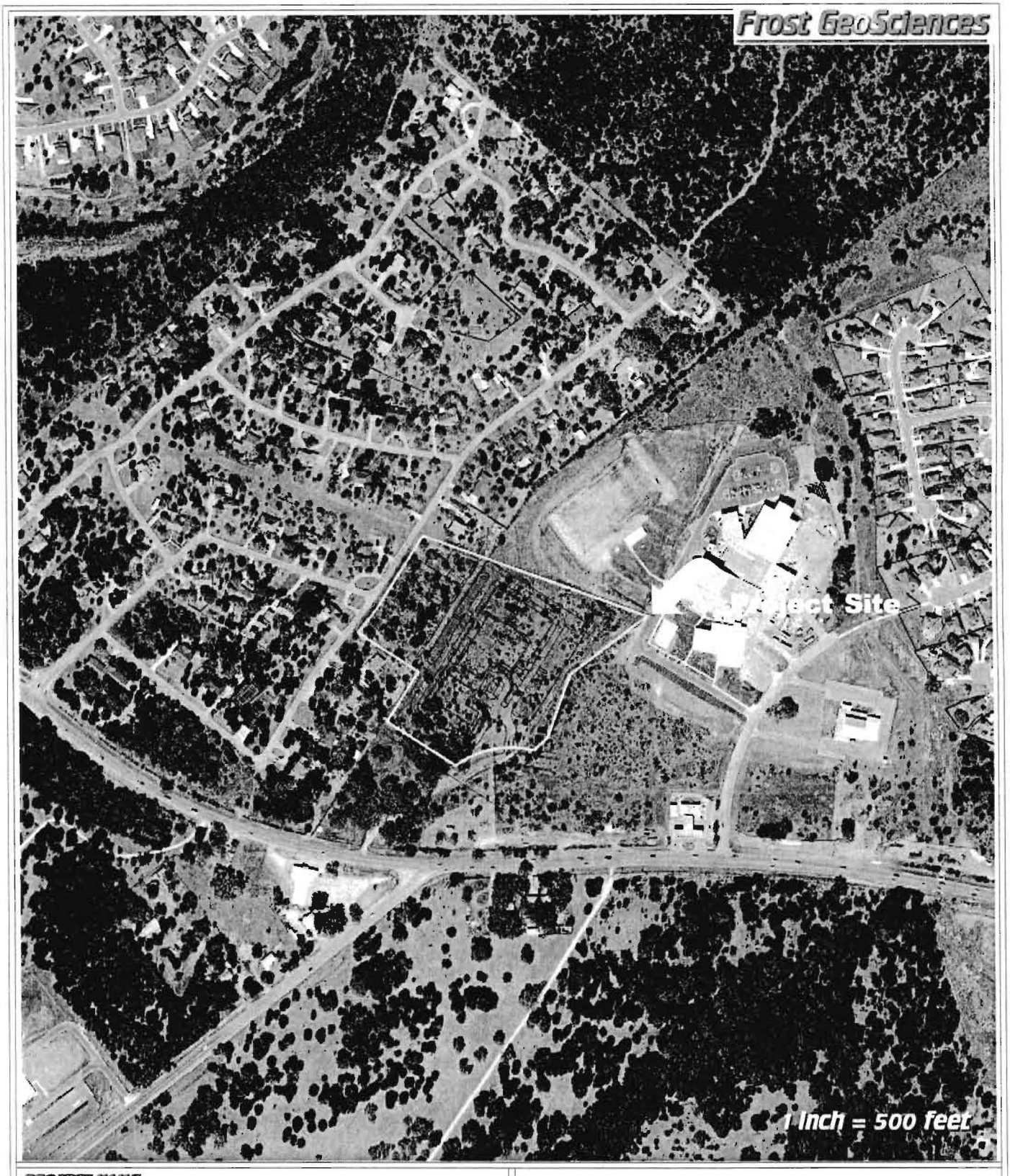


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

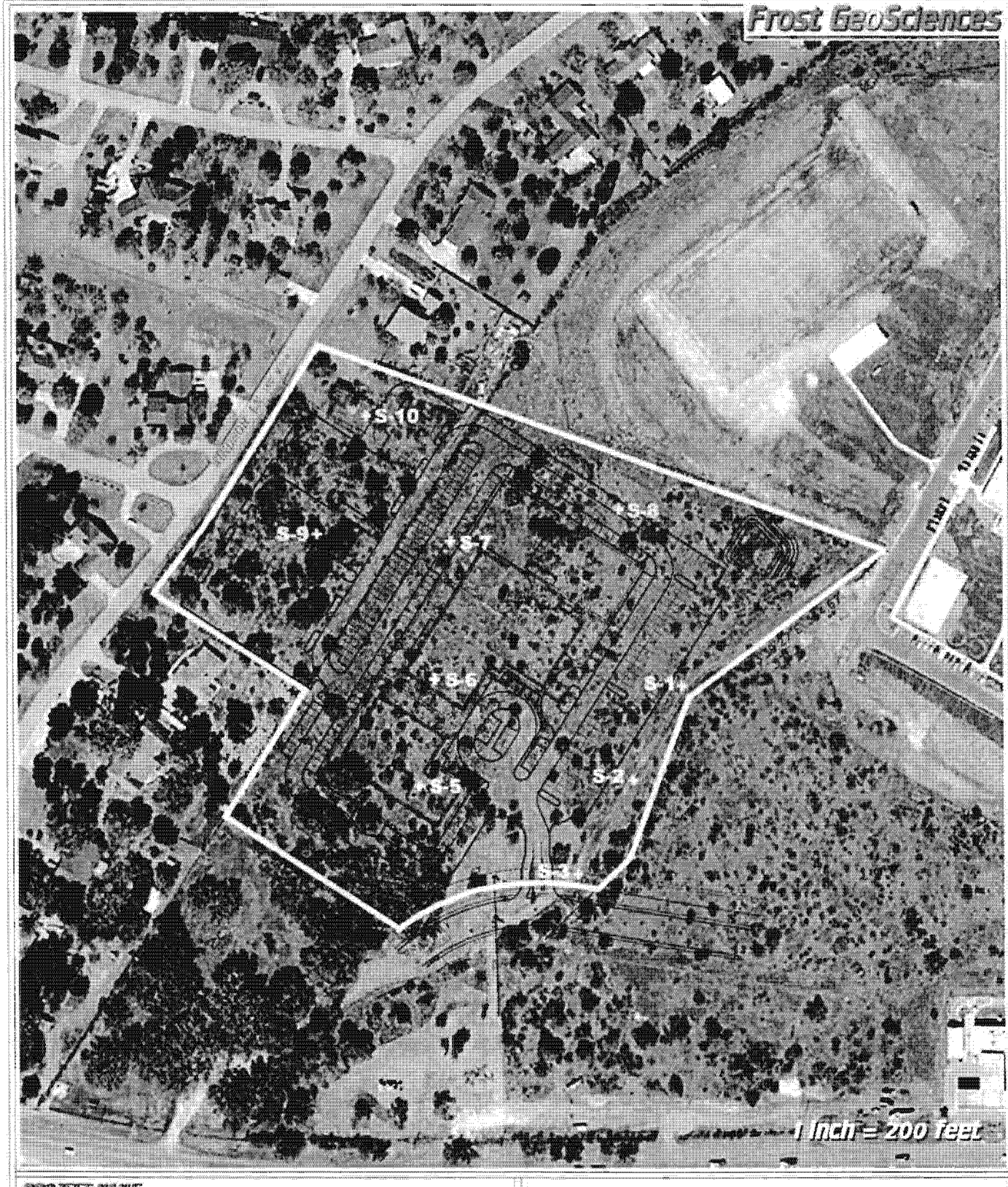
United States Geologic Survey
Water Resources Investigations #94-4117
Geologic Map of Comal County, Texas

PROJECT NO.: FGS-E09139

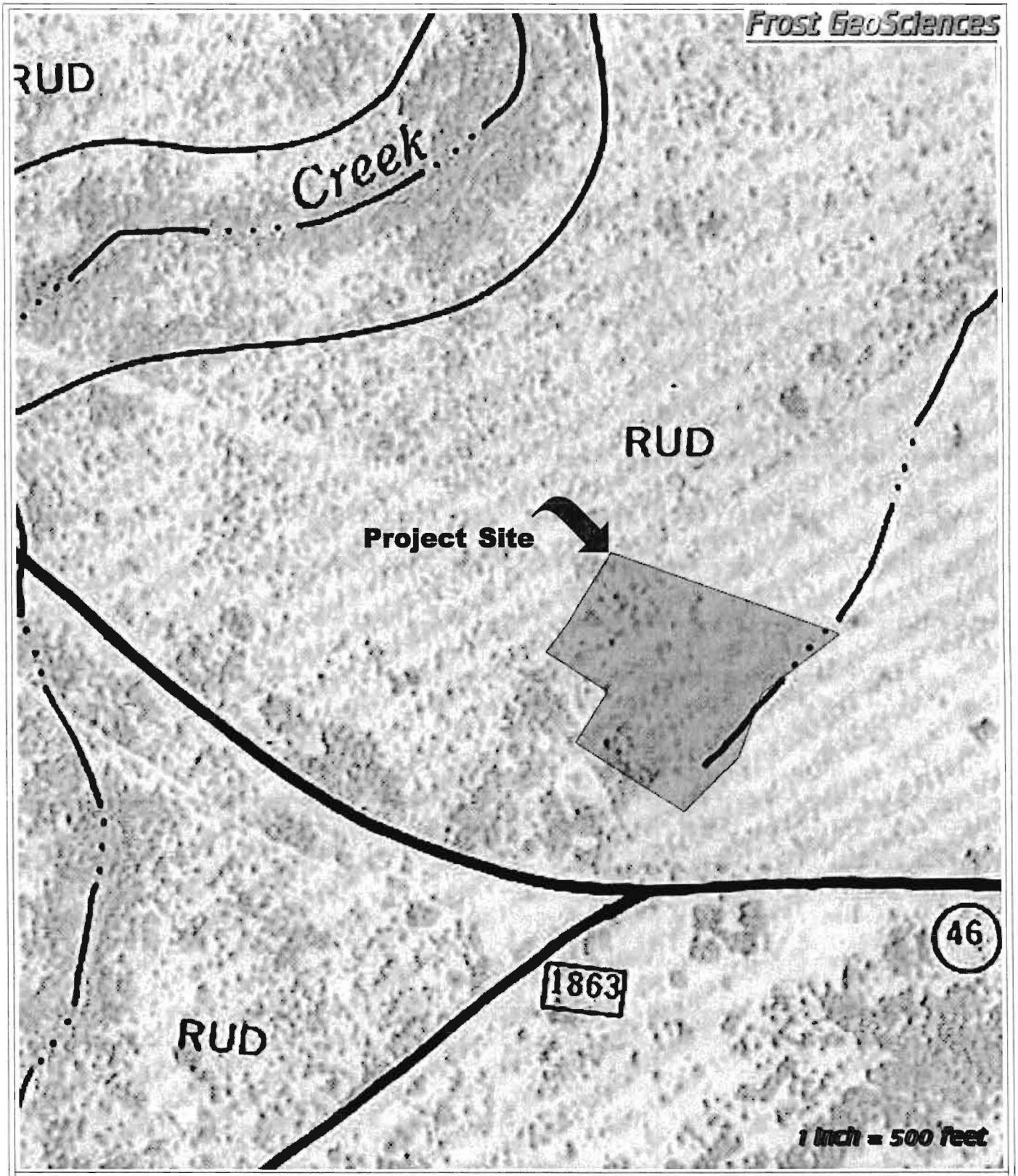
DATE: July 31, 2009



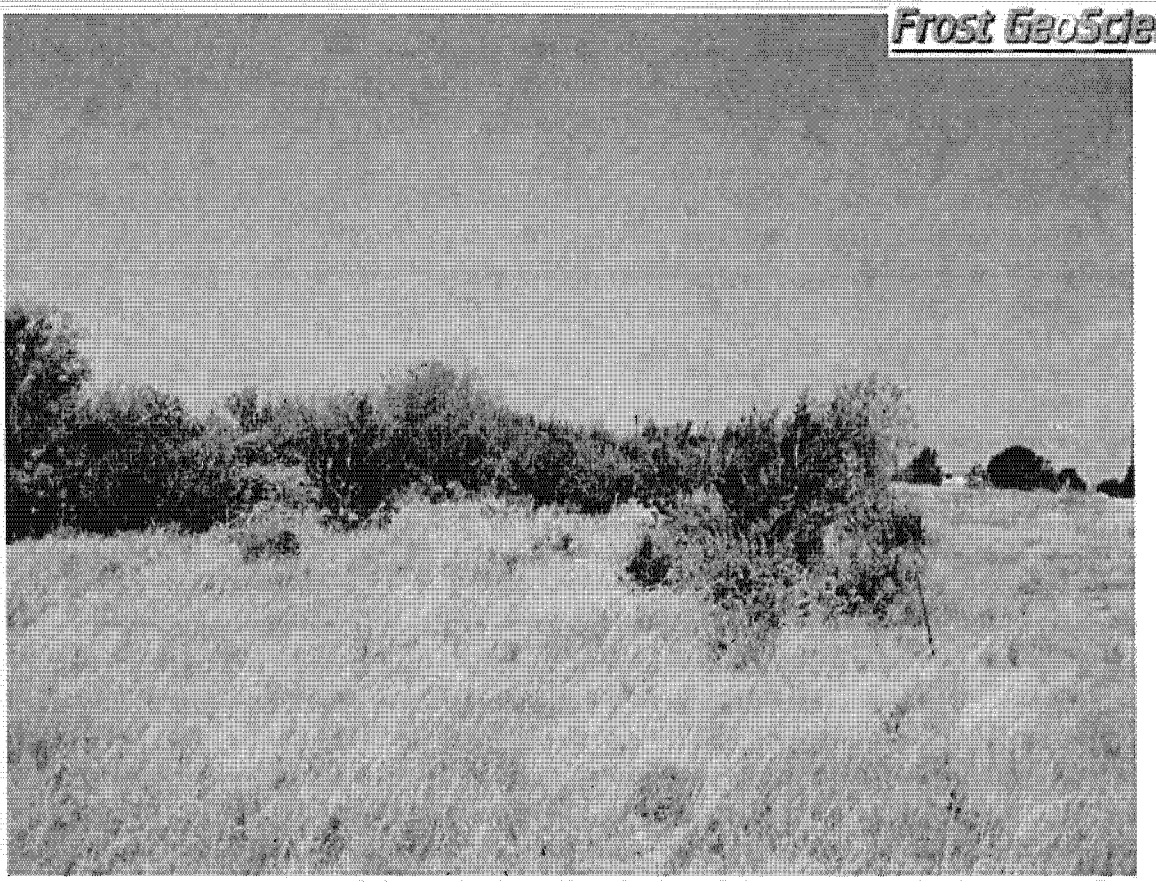
PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities / Development on the Edwards Aquifer Recharge / Transition Zone The New Braunfels Church of Christ New Braunfels, Texas	2009 Aerial Photograph Landiscor Aerial Information
PROJECT NO.: FGS-E09139	**DATE:** July 31, 2009



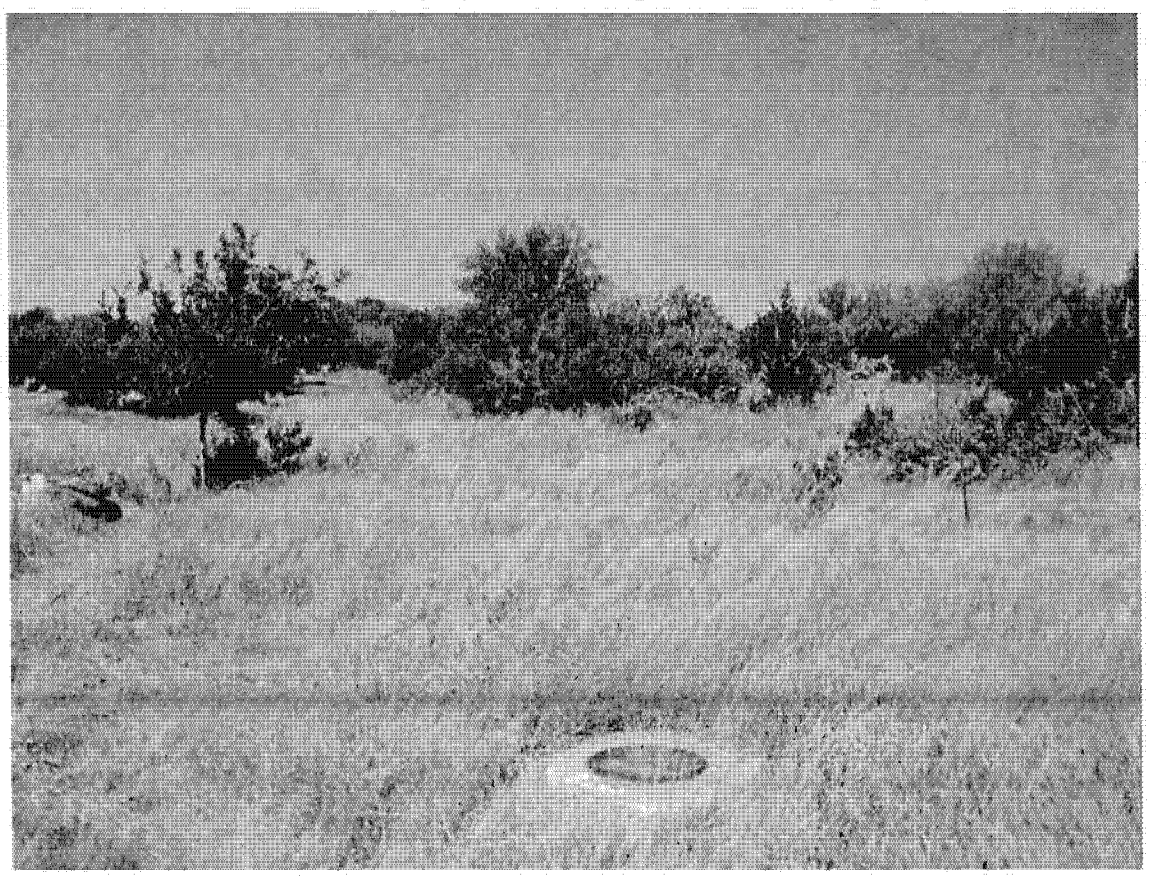
PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities / Development on the Edwards Aquifer Recharge / Transition Zone The New Braunfels Church of Christ New Braunfels, Texas	2009 Aerial Photograph with PRF's Landiscor Aerial Information
PROJECT NO.: FGS-E09139	DATE: July 31, 2009



PROJECT NAME:	1973 Aerial Photograph U.S.D.A. Soil Survey of Comal & Hays Counties, Texas	
Geologic Site Assessment (WPAP) for Regulated Activities / Development on the Edwards Aquifer Recharge / Transition Zone The New Braunfels Church of Christ New Braunfels, Texas	PROJECT NO.: FGS-E09139	DATE: July 31, 2009



View to the west, of the project site along the northern property line.



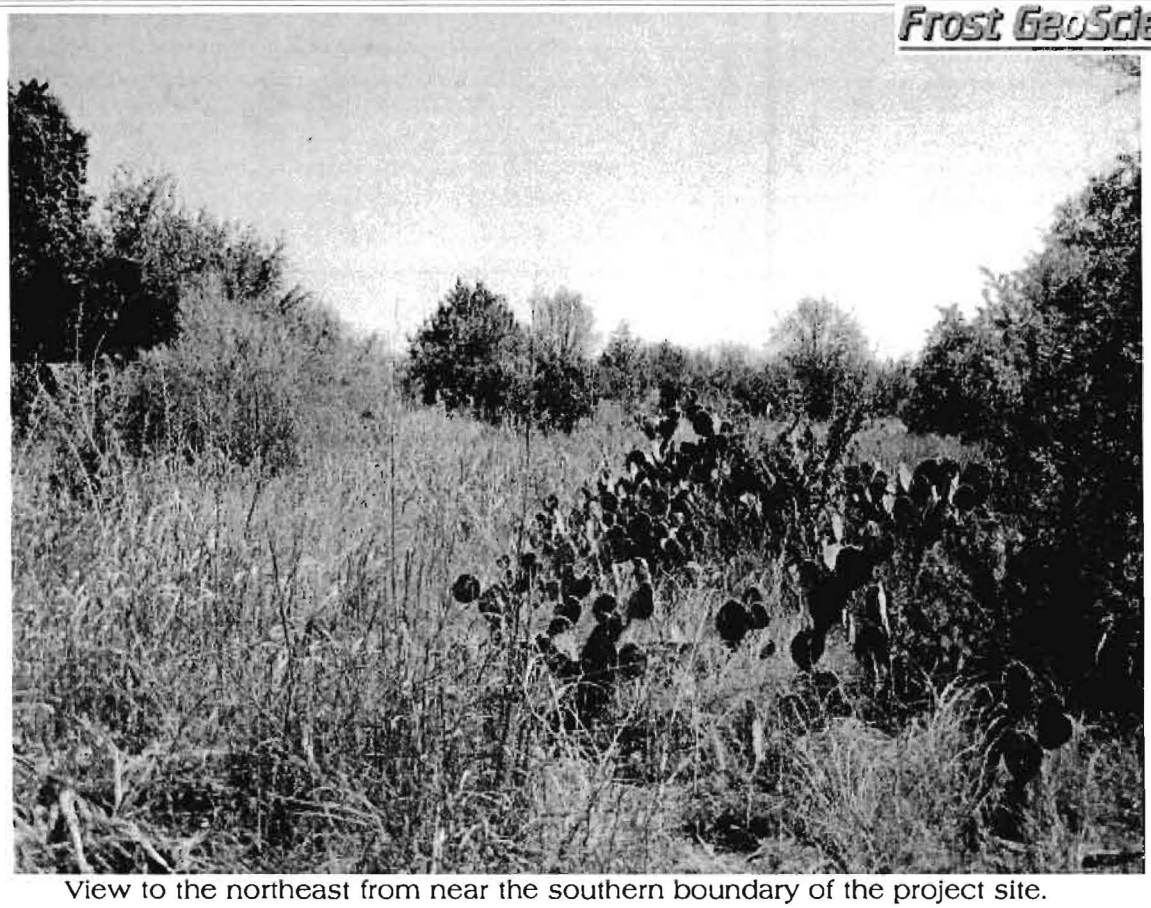
View to the southwest, of the project site along the eastern property line.



View of Potential Recharge Feature #S-1, representative of S-2 & S-3.



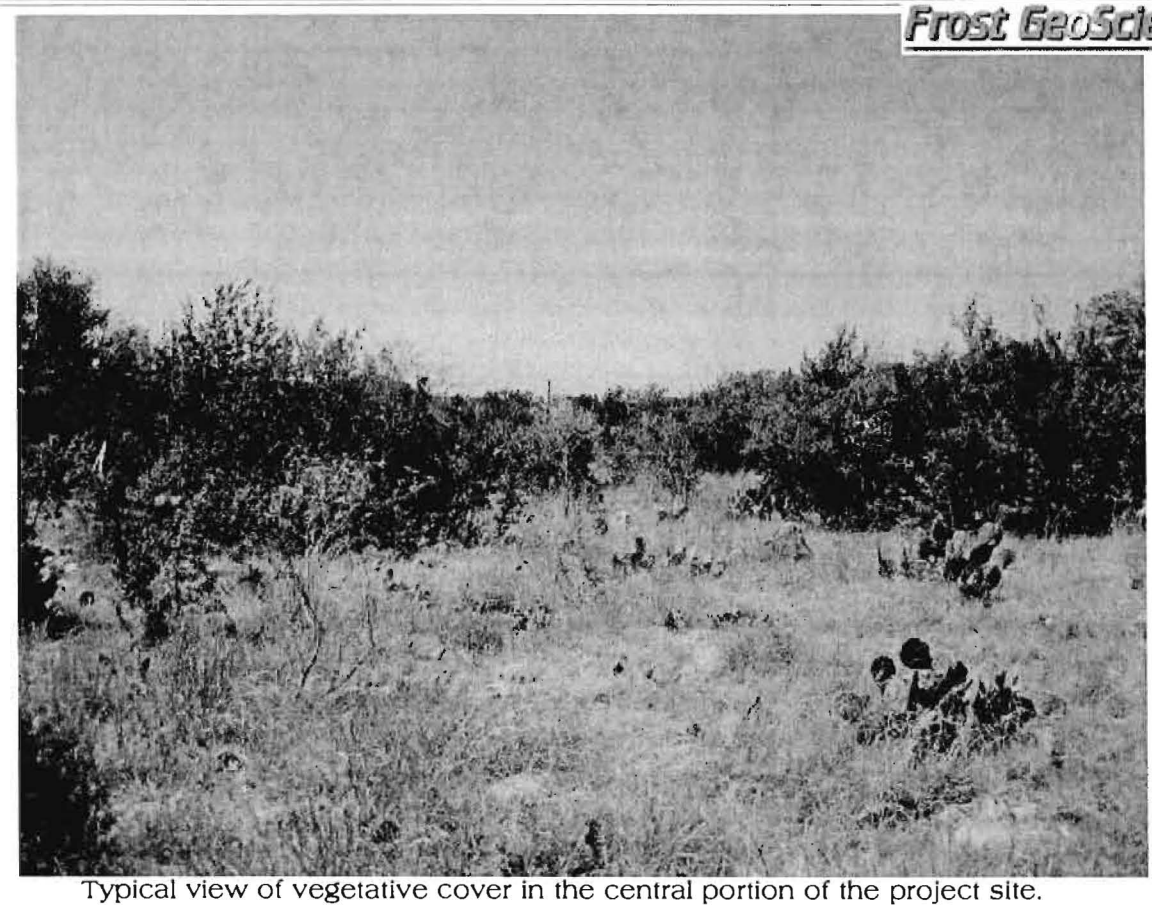
View of Potential Recharge Feature #S-5.



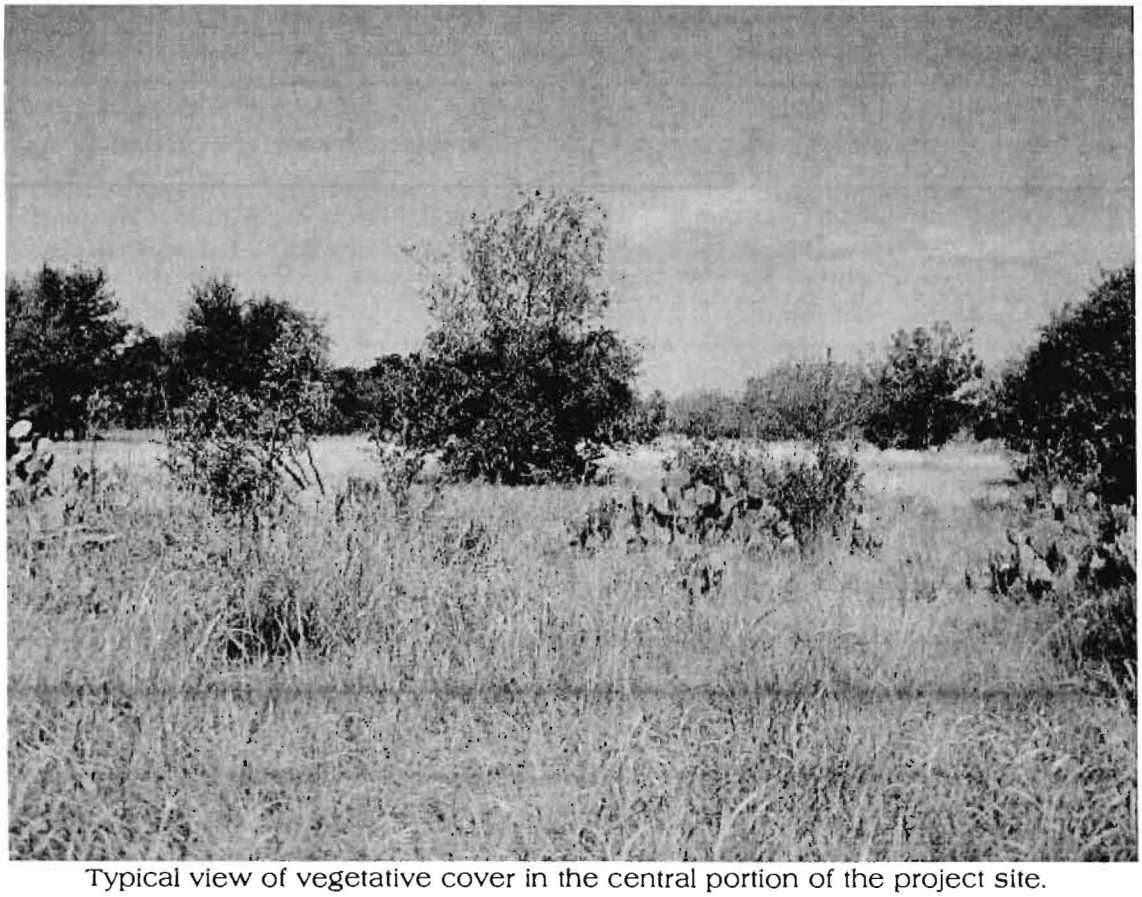
View to the northeast from near the southern boundary of the project site.



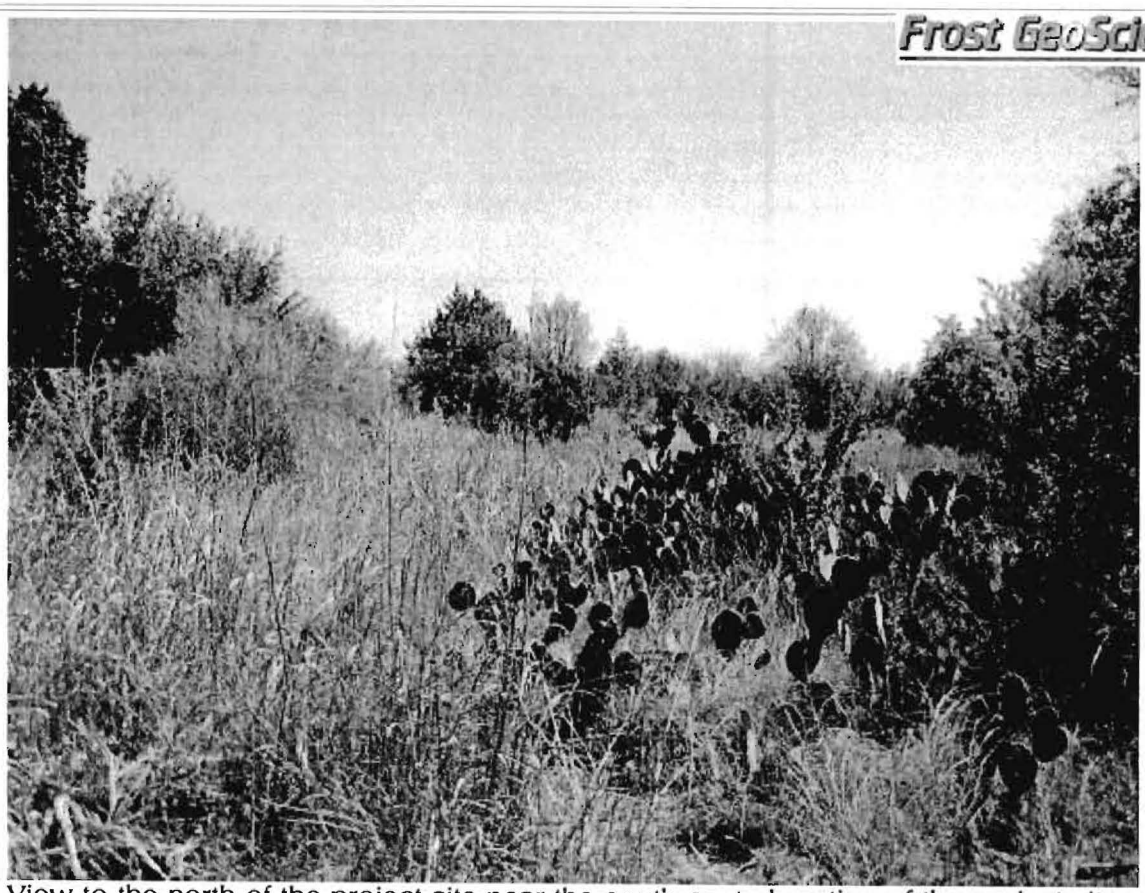
View of Potential Recharge Feature # S-6.



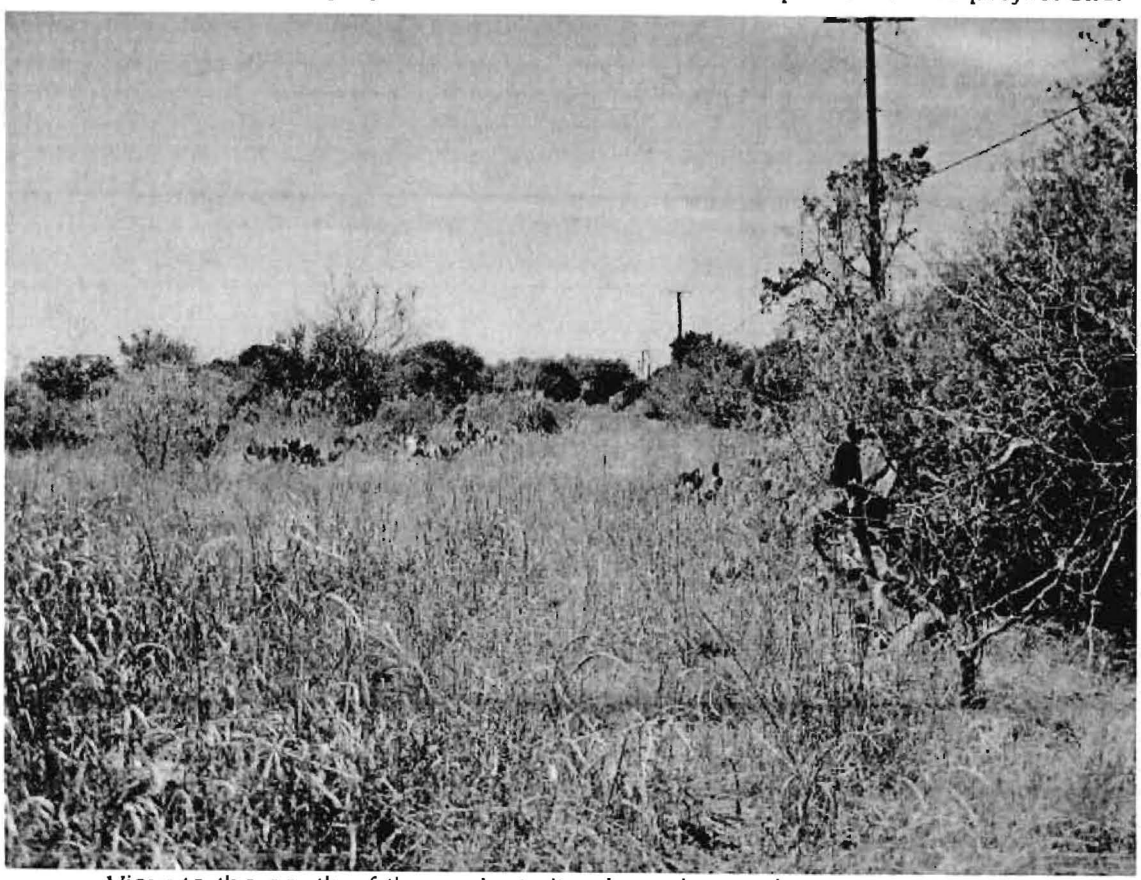
Typical view of vegetative cover in the central portion of the project site.



Typical view of vegetative cover in the central portion of the project site.



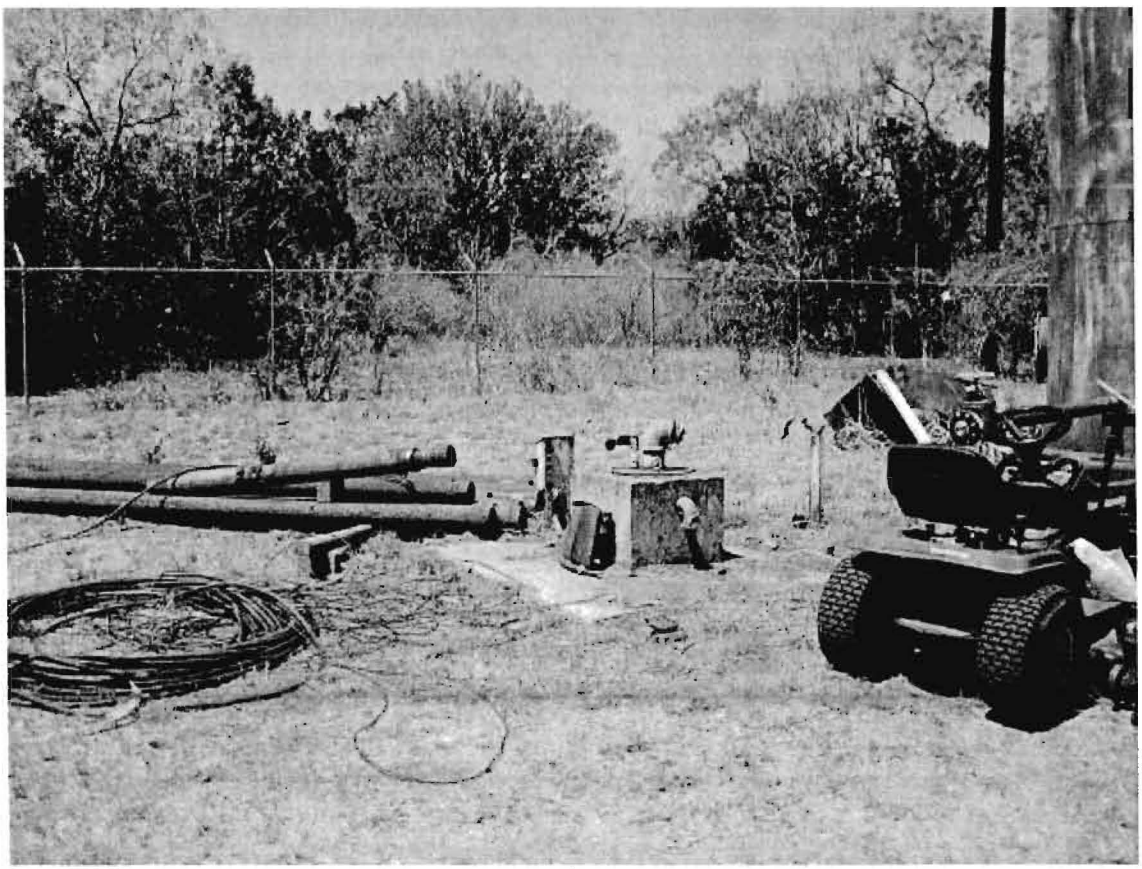
View to the north of the project site near the south central portion of the project site.



View to the south of the project site along the northern property line.



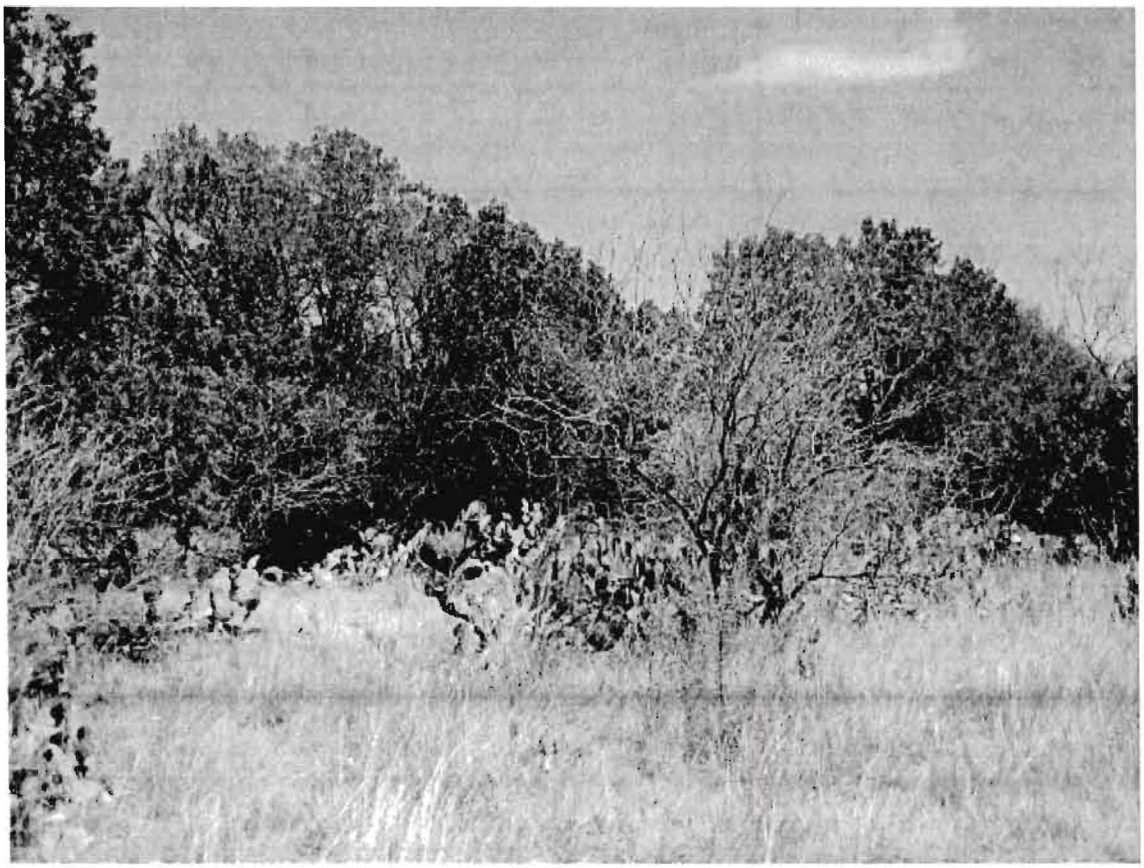
View of Potential Recharge Feature # S-9.



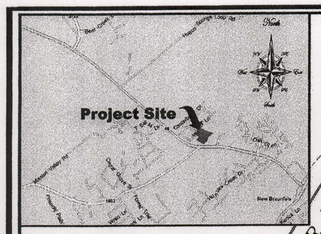
View of Potential Recharge Feature # S-10.



View to the southwest from the western boundary of the project site.



Typical view of vegetative cover in the western portion of the project site.



Location Map

WINDSOR LN. (60' R.O.W.)

WOODS DR.

ALYSSA WAY
(R.O.W. VARIES)

S-1+ S-2+ S-3+ +S-5 +S-6 +S-7 +S-8 S-9+ +S-10

Kep

840

830

850

8" WW

8" W

L=302.45'
R=363.00'

N80°27'20"W
48.73'

N9°32'40"E
14.22'

S70°06'54"E 267.14'

S70°06'28"E 632.78'

N53°59'58"E 317.59'

N32°21'59"E 122.75'

N57°57'58"W 266.22'

N57°10'48"W 270.59'

N30°27'21"E 302.44'

N59°32'27"E 388.87'

LOT 7
BLOCK 7
NORTHWOODS
UNIT TWO
VOL. 7, PG. 58

LOT 2
BLOCK 1
11.873 AC.
CHURCH OF CHRIST
SUBDIVISION
DOC. NO.
M.P.R.

CHURCH OF CHRIST
OF NEW BRAUNFELS, TEXAS
11.306 ACRE TRACT
DOC. NO. 200906037874

LOT 2A
5.801 AC.
AND LOT 2B
AND BLOCK 1
OAKRIDGE SCHOOL
SUBDIVISION
UNIT TWO
DOC. NO.
M.P.R.

NEWTEX-REUSENS INC.
REMAINDER OF
VOL. 3201, PG. 564-584

NOTE:
NO ON-SITE SEWAGE FACILITIES
(OSSF) ARE TO BE CONSTRUCTED
WITHIN THE 100 YEAR
FLOODPLAIN.

LOT 1
WOODS
UNIT ONE
VOL. 6, PG. 305
M.P.R.

6' CHAIN LINK

1/2"IR

1/2"IRF

TBM
Cut in Top of Curb
Elevation = 845.44'

TBM
Cut in Top of Curb
Elevation = 845.57'

TBM
Cut in Top of Curb
Elevation = 845.50'

TBM
Cut in Top of Curb
Elevation = 845.44'

TBM
Cut in Top of Curb
Elevation = 845.57'

TBM
Cut in Top of Curb
Elevation = 845.50'

Frost GeoSciences

Construction Materials ▪ Forensics
Environmental ▪ Geotechnical

Site Geologic Map

Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
for the
New Braunfels Church of Christ
11.306 Acres
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-E09139

Legend

Fill	-	Fill Material
Qal	-	Alluvium
Kau	-	Austin Chalk
Kef	-	Eagle Ford Shale
Kbu	-	Buda Limestone
Kdr	-	Del Rio Clay
Kgt	-	Georgetown Limestone
Kep	-	Edwards Person Limestone
Kek	-	Edwards Kainer Limestone
Kgr	-	Glen Rose Formation
S-#	-	Potential Recharge Feature (PRF)
	-	Formation Contact
	-	100-Year Floodplain - Zone A
	-	100-Year Floodplain - Zone AE
	-	Other Flood Hazard Area - Zone X (shaded)

Floodplain Information Obtained From
FIRM: Flood Insurance Rate Map
Comal County, Texas: Panel # 48091C0435F, Revised 9/02/09

Fault Information Obtained From:
Bureau of Economic Geology, Geologic Atlas of Texas, San Antonio Sheet (1983)
U.S. Geological Survey, Water Resources Investigations Report 94-4117 (1994)
Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000)

North
NW NE
West East
SW SE
South

Graphic Scale

40 0 20 40 80

(In Feet)

1 inch = 40 feet
Representative Fraction 1:480

Contour Interval - 1 foot

STATE OF TEXAS
Steve M. Frost
Geology
License No. 315
LICENSED PROFESSIONAL GEOSCIENTIST

Signature of Texas Licensed Geoscientist
Steve Frost, TPG# 315, AIPG # 10176

Water Pollution Abatement Plan Application

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

REGULATED ENTITY NAME: New Braunfels Church of Christ

REGULATED ENTITY INFORMATION

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

2. Total site acreage (size of property): 11.58

3. Projected population: 1 Church/Approximately 71 EDU's

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

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	54,552	÷ 43,560 =	1.25
Parking	219,278	÷ 43,560 =	5.03
Other paved surfaces	20,255	÷ 43,560 =	0.46
Total Impervious Cover	294,085	÷ 43,560 =	6.74
Total Impervious Cover ÷ Total Acreage x 100 =			58.20%

5. X **ATTACHMENT A - Factors Affecting Water Quality.** A description of any factors that could affect surface water and groundwater quality is provided at the end of this form.

6. X Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

FOR ROAD PROJECTS ONLY N/A
Complete questions 7-12 if this application is exclusively for a road project.

7. Type of project:
   ___ TXDOT road project.
   ___ County road or roads built to county specifications.
   ___ City thoroughfare or roads to be dedicated to a municipality.
   ___ Street or road providing access to private driveways.

8. Type of pavement or road surface to be used:
   ___ Concrete
   ___ Asphaltic concrete pavement
   ___ Other: _____

9. Length of Right of Way (R.O.W.): ____ feet.
Width of R.O.W.: ____ feet.
L x W = ____ Ft^2 ÷ 43,560 Ft^2/Acre = ____ acres.

10. Length of pavement area: ____ feet.
Width of pavement area: ____ feet.
L x W = ____ Ft^2 ÷ 43,560 Ft^2/Acre = ____ acres.
Pavement area ____ acres ÷ R.O.W. area ____ acres x 100 = ___% impervious cover.

11. __ A rest stop will be included in this project.
__ A rest stop will **not** be included in this project.

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

STORMWATER TO BE GENERATED BY THE PROPOSED PROJECT

13. **ATTACHMENT B - Volume and Character of Stormwater.** A description of the volume and character (quality) of the stormwater runoff which is expected to occur from the proposed project is provided at the end of this form. The estimates of stormwater runoff quality and quantity should be based on area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

WASTEWATER TO BE GENERATED BY THE PROPOSED PROJECT

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

X % Domestic	74,304 gallons/day
__% Industrial	_____ gallons/day
__% Commingled	_____ gallons/day

TOTAL 74,304 gallons/day

15. Wastewater will be disposed of by:
___**On-Site** Sewage Facility (OSSF/Septic Tank):
ATTACHMENT C - Suitability Letter from Authorized Agent. An on-site sewage facility will be used to treat and dispose of the wastewater. The appropriate licensing authority's (authorized agent) written approval is provided at the end of this form. It states that the land is suitable for the use of an on-site sewage facility or identifies areas that are not suitable.
__ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

X Sewage Collection System (Sewer Lines):
X Private service laterals from the wastewater generating facilities will be connected to an existing SCS.
__ Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.
__ The SCS was previously submitted on _____.
__ The SCS was submitted with this application.

__ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to executive director approval.

The sewage collection system will convey the wastewater to the Gruene Road Wastewater Treatment Plant. The treatment facility is:

X existing.
__ proposed.

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

SITE PLAN REQUIREMENTS

Items 17 through 27 must be included on the Site Plan.

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

18. 100-year floodplain boundaries
__ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
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):

_____

_____

19. X The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Show lots, recreation centers, buildings, roads, etc.
__ The layout of the development is shown with existing contours. Finished topographic contours will not differ from the existing topographic configuration and are not shown.

20. 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.
X 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.

21. Geologic or manmade features which are on the site:
X All **sensitive and possibly sensitive** geologic or manmade features identified in the Geologic Assessment are shown and labeled.
__ No **sensitive and possibly sensitive** geologic or manmade features were identified in the Geologic Assessment.
__ **ATTACHMENT D - Exception to the Required Geologic Assessment.** An exception to the Geologic Assessment requirement is requested and explained in ATTACHMENT D provided at the end of this form. Geologic or manmade features were found and are shown and labeled.
__ **ATTACHMENT D - Exception to the Required Geologic Assessment.** An exception to the Geologic Assessment requirement is requested and explained in ATTACHMENT D provided at the end of this form. No geologic or manmade features were found.

22. X The drainage patterns and approximate slopes anticipated after major grading activities.

23. X Areas of soil disturbance and areas which will not be disturbed.

24. X Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.

25. X Locations where soil stabilization practices are expected to occur.

26. X Surface waters (including wetlands).

27. ___ Locations where stormwater discharges to surface water or sensitive features.
X There will be no discharges to surface water or sensitive features.

ADMINISTRATIVE INFORMATION

28. X One (1) original and ~~three~~ (4) copies of the completed application have been provided.

29. X Any modification of this WPAP will require TCEQ executive director 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 FORM** is hereby submitted for TCEQ review and executive director approval. The form was prepared by:

Michael G. Short, P.E.
Print Name of Customer/Agent

Signature of Customer/Agent

10/22/09
Date

Attachment A – Factors Affecting Water Quality

There is a potential for contamination as result of servicing and operating construction equipment (oil, gas, etc), from construction materials (concrete, base, etc), and from portable toilet facilities.

The potential sources of contamination after construction is complete are gas and oil from vehicles, and pesticides, and fertilizers from lawn maintenance personnel.

Attachment B – Volume and Character of Stormwater

Currently the proposed New Braunfels Church of Christ site is undeveloped with the exception of one well located on the northwest corner of the property. Onsite flows are separated on site by an existing swale. All flows eventually make there way into a tributary to Bleider's Creek.

The proposed impervious cover will be graded to drain to a detention pond. All drainage improvements have been designed to restrict flows to undeveloped conditions immediately downstream for the 10-year and 100-year storm frequencies. Existing conditions runoff for the 10-year and 100-year storms are 82 cfs and 165 cfs, respectively. Future Phase 2 conditions runoffs for the 10-year and 100-year storms are 80 cfs and 162 cfs, respectively.

A Sand Filter System is proposed for this development. This system has been designed to mitigate the effects of the increase in impervious cover in the Edwards Aquifer Recharge Zone. It has been designed using the Texas Commission of Environmental Qualities Technical Guidance Manual. Pollutants that can be expected after construction are sediments, oil and gas from vehicles, insect pesticides, and lawn care products.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Phase I
Date Prepared: 8/17/2009

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

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

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

where:

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

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

County =	Comal	
Total project area included in plan * =	11.58	acres
Predevelopment impervious area within the limits of the plan * =	0.02	acres
Total post-development impervious area within the limits of the plan* =	3.49	acres
Total post-development impervious cover fraction * =	**0.30**	
P =	**33**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**3117**	lbs.

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

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

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

Drainage Basin/Outfall Area No. =	1	
Total drainage basin/outfall area =	10.70	acres
Predevelopment impervious area within drainage basin/outfall area =	0.50	acres
Post-development impervious area within drainage basin/outfall area =	3.49	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.33**	
$L_{M\ THIS\ BASIN}$ =	**2684**	lbs.



10/22/09

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter

Removal efficiency = **89** percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

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

A_C = 6.40 acres
A_I = 3.49 acres
A_P = **2.91** acres
L_R = **3593** lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 3117 lbs.

F = **0.87**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth = **1.44** inches
Post Development Runoff Coefficient = **0.3838**
On-site Water Quality Volume = **12841** cubic feet

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

Off-site area draining to BMP = 4.30 acres

Off-site Impervious cover draining to BMP =	0.50	acres	
Impervious fraction of off-site area =	**0.12**		
Off-site Runoff Coefficient =	**0.1391**		
Off-site Water Quality Volume =	**3126**	cubic feet	
Storage for Sediment =	**3193**		
Total Capture Volume (required water quality volume(s) x 1.20) =	**19161**	cubic feet	

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

7. Retention/Irrigation System — Designed as Required in RG-348 — Pages 3-42 to 3-46

Required Water Quality Volume for retention basin = **NA** cubic feet

Irrigation Area Calculations:

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

8. Extended Detention Basin System — Designed as Required in RG-348 — Pages 3-46 to 3-51

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

9. Filter area for Sand Filters — Designed as Required in RG-348 — Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin =	**19161**	cubic feet	
Minimum filter basin area =	**713**	square feet	
Maximum sedimentation basin area =	**6420**	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	**1605**	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	**19161**	cubic feet	
Minimum filter basin area =	**1284**	square feet	
Maximum sedimentation basin area =	**5136**	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	**321**	square feet	For maximum water depth of 8 feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Proposed Conditions Phase II
Date Prepared: 8/17/2009

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

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

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

where:

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

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

County =	Comal	
Total project area included in plan * =	11.58	acres
Predevelopment impervious area within the limits of the plan * =	0.02	acres
Total post-development impervious area within the limits of the plan * =	6.74	acres
Total post-development impervious cover fraction * =	**0.58**	
P =	**33**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**6035**	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	13.60	acres
Predevelopment impervious area within drainage basin/outfall area =	0.50	acres
Post-development impervious area within drainage basin/outfall area =	7.24	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.53**	
$L_{M\ THIS\ BASIN}$ =	**6050**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter

Removal efficiency = **89** percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

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

A_C = 9.30 acres
A_I = 6.75 acres
A_P = **2.55** acres
L_R = **6900** lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 6035 lbs.

F = **0.87**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth = **1.44** inches
Post Development Runoff Coefficient = **0.5326**
On-site Water Quality Volume = **25891** cubic feet

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

Off-site area draining to BMP = 4.30 acres

Off-site Impervious cover draining to BMP =	0.50	acres	
Impervious fraction of off-site area =	**0.12**		
Off-site Runoff Coefficient =	**0.1391**		
Off-site Water Quality Volume =	**3126**	cubic feet	
Storage for Sediment =	**5804**		
Total Capture Volume (required water quality volume(s) x 1.20) =	**34821**	cubic feet	

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

7. Retention/Irrigation System — Designed as Required in RG-348 — Pages 3-42 to 3-46

Required Water Quality Volume for retention basin = **NA** cubic feet

Irrigation Area Calculations:

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

8. Extended Detention Basin System — Designed as Required in RG-348 — Pages 3-46 to 3-51

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

9. Filter area for Sand Filters — Designed as Required in RG-348 — Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin =	**34821**	cubic feet	
Minimum filter basin area =	**1438**	square feet	
Maximum sedimentation basin area =	**12946**	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	**3236**	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	**34821**	cubic feet	
Minimum filter basin area =	**2589**	square feet	
Maximum sedimentation basin area =	**10357**	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	**647**	square feet	For maximum water depth of 8 feet

Temporary Stormwater Section

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

REGULATED ENTITY NAME: New Braunfels Church of Christ

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

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

   ___ 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.
   ___ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
   ___ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An **Aboveground Storage Tank Facility Plan** application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.
   X Fuels and hazardous substances will not be stored on-site.

2. X **ATTACHMENT A - Spill Response Actions**. A description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is provided at the end of this form.

3. N/A Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

4. X **ATTACHMENT B - Potential Sources of Contamination.** Describe in an attachment at the end of this form any other activities or processes which may be a potential source of contamination.
   ___ There are no other potential sources of contamination.

SEQUENCE OF CONSTRUCTION

5. X **ATTACHMENT C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is provided at the end of this form. For each activity described, an estimate of the total area of the site to be disturbed by each activity is given.

6. X Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: Bleiders Creek

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

on the site plan.

7. X **ATTACHMENT D - Temporary Best Management Practices and Measures.** A description of the TBMPs and measures that will be used during and after construction are provided at the end of this form. For each activity listed in the sequence of construction, include appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

   X TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information has been provided in the attachment at the end of this form

   a. A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

   b. A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

   c. A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

   d. A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

   N/A **ATTACHMENT E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is provided at the end of this form. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

   X There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. X **ATTACHMENT F - Structural Practices.** Describe the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains has been avoided.

10. X **ATTACHMENT G - Drainage Area Map**. A drainage area map is provided at the end of this form to support the following requirements.

   ___ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

   ___ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

   ___ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

X There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

11. N/A **ATTACHMENT H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure has been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are provided as at the end of this form.

12. X **ATTACHMENT I - Inspection and Maintenance for BMPs.** A plan for the inspection of temporary BMPs and measures and for their timely maintenance, repairs, and, if necessary, retrofit is provided at the end of this form. A description of documentation procedures and recordkeeping practices is included in the plan.

13. X All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. X If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. X Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. X Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

SOIL STABILIZATION PRACTICES

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

17. X **ATTACHMENT J - Schedule of Interim and Permanent Soil Stabilization Practices.** A schedule of the interim and permanent soil stabilization practices for the site is attached at the end of this form.

18. X Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. X Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

ADMINISTRATIVE INFORMATION

20. X All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

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

22. X Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

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

Michael G. Short, P.E.
Print Name of Customer/Agent

Signature of Customer/Agent

10/22/04
Date

ATTACHMENT A-SPILL RESPONSE ACTIONS

The following includes a copy of Section 1.4.16 of the TCEQ "Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices"' Pages 1-118 through 1-121, Spill Prevention and Control. The following is made part of the spill response action plan. In addition in the event of a significant hazardous spill the contractor or construction personnel shall notify TCEQ by telephone as soon as possible and within 24-hours at (512)339-2929 (Austin) or (210)490-3096 (San Antonio) between 8 am and 5 pm or after hours contact the Environmental Release Hotline at 1-800-832-8224. The contractor shall have available at the construction site all emergency numbers to include the Edwards Aquifer Authority (210) 222-2204 or 1-800-292-1047 and the National Response Center (202) 267-2675 or 1-800-424-8802.



RG-348
Revised July 2005

Complying with the Edwards Aquifer Rules

Technical Guidance on Best Management Practices

Field Operations Division

printed on recycled paper

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

1.4.16 Spill Prevention and Control

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

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

Education

(1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.

(2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.

(3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings)

(4) Establish a continuing education program to indoctrinate new employees.

(5) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

(1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.

(2) Store hazardous materials and wastes in covered containers and protect from vandalism.

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

(4) Train employees in spill prevention and cleanup.

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

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

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

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

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

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

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

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

Cleanup

(1) Clean up leaks and spills immediately.

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

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

Minor Spills

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

(2) Use absorbent materials on small spills rather than hosing down or burying the spill.

(3) Absorbent materials should be promptly removed and disposed of properly.

(4) Follow the practice below for a minor spill:

(5) Contain the spread of the spill

(6) Recover spilled materials.

(7) Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

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

Spills should be cleaned up immediately:

(1) Contain spread of the spill.

(2) Notify the project foreman immediately.

(3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.

(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.

(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.

(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.

(3) Notification should first be made by telephone and followed up with a written report.

(4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.

(5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at: http://www.tnrcc.state.tx.us/enforcement/emergency_response.html

Vehicle and Equipment Maintenance

(1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

(2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately

(3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.

(4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.

(5) Place drip pans or absorbent materials under paving equipment when not in use.

(6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.

(7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

(8) Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.

(9) Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

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

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

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

Attachment B – Potential Sources of Contamination

There is a potential for contamination as result of servicing and operating construction equipment (oil, gas, etc), from construction materials (concrete, base, etc), and from portable toilet facilities.

The potential sources of contamination after construction is complete are gas and oil from vehicles, and pesticides, and fertilizers from lawn maintenance personnel.

ATTACHMENT C – SEQUENCE OF MAJOR ACTIVITIES

The following is a sequence of major activities which will involve soil disturbance along with an estimate of area disturbed by each activity

Sequence No.	Description of Soil Disturbing Activity	Estimated Area Disturbed by each Activity (Acres)
1	Installation of Phase 1 Construction Exit and Erosion Control	0.50
2	Phase 1 Clearing and Grubbing of Detention Pond and Sand Filter System	1.75
3	Phase 1 Excavation of Detention Pond, Sand Filter System, and Construction of Outfall Structure	1.75
4	Phase 1 Clearing and Grubbing of Parking Area	3.25
5	Phase 1 Excavation and Construction of Parking Area	3.25
6	Phase 1 Construction of New Driveway.	1.00
7	Phase 1 Building Pad Site Preparations	0.75
8	Installation of Phase 2 Construction Exit and Erosion Control	0.50
9	Phase 2 Clearing and Grubbing of Parking Area	3.50
10	Phase 2 Excavation and Construction of Parking Area	3.50
11	Phase 2 Building Pad Site Preparations	0.75

ATTACHMENT D-TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

The Temporary Best Management Practices (TBMP) that will be used for this project are silt fences, rock berms, concrete truck washout pits, and temporary construction entrance/exits. The temporary controls will be installed prior to construction and shall be maintained during construction by the contractor. The controls shall be removed by the contractor when vegetation is established and the construction area is stabilized.

The silt fences, rock berms, concrete truck washout pits, and temporary construction entrance/exits shown on the site plan shall be in place prior to any construction activities. These temporary measures will remain in place throughout clearing and grubbing, excavation and grading and underground utility service removal and installation. Upon completion, disturbed areas will be stabilized via hydro mulching.

a. The majority of stormwater that originates upgradient of the project site will be filtered via existing vegetation. In addition rock berms and silt fences will be utilized. The rock berms and silt fences are intended to slow the velocity of the water down allowing the sediment to settle out. It shall be the contractor's responsibility to remove the sediment that builds up after significant rainfall events. The disturbed areas will be re-vegetated as required.

b. Stormwater that originates on site will be filtered by silt fences and/or rock berms on the downgradient side of the property. The silt fences and rock berms will slow the velocity of the water down and the sediment will settle out. It shall be the contractor's responsibility to remove the sediment that builds up after significant rainfall events. There will be no contaminated/polluted runoff coming off this site other than sediment which will be handled with silt fence, rock berms, concrete truck washout pits, and the temporary construction exits.

c. In the areas where concrete is proposed a concrete truck washout pit will be available. The concrete truck washout pit will provide an area to wash excess concrete from the concrete trucks without the risk of groundwater contamination. It shall be the responsibility of the contractor to remove concrete from concrete truck washout pits once the concrete has hardened on a regular basis.

d. BMP control measures will prevent pollutants from entering surface streams, sensitive features or the aquifer by capturing the silts and sediment before escaping the construction site. The silt fences and rock berms will slow the velocity of the water down and the sediment will settle out. It shall be the responsibility of the contractor to remove the sediment that builds up after significant rainfall events. The silt fences and rock berms will capture the sediment that would otherwise be conveyed to streams, sensitive features, etc.

e. There were no sensitive features identified in the geologic assessment. However, if any sensitive features were to be found during construction, all regulated

activities near the sensitive feature will be suspended immediately and appropriate action shall be taken per the TCEQ's Water Pollution Abatement Plan General Notes. With regards to measures taken to maintain flow to sensitive features, high service rock berms along with a natural buffer zone around the feature would be implemented in accordance with TCEQ guidelines.

ATTACHMENT F-STRUCTURAL PRACTICES

The structural practices that will be used for temporary control of erosion/sediment on this site are silt fences, rock berms, concrete truck washout pits, and temporary construction entrance/exits. Runoff will be filtered by the temporary BMP's prior to leaving the site.

ATTACHMENT I-INSPECTION AND MAINTENANCE FOR BMP'S

Silt Fence Inspection and Maintenance Guidelines:

1) Inspect all fencing weekly and after any rainfall.
2) Remove sediment when buildup reaches 6 inches, or install a second line of fencing parallel to the old fence.
3) Replace any torn fabric or install a second line of fencing parallel to the torn section.
4) Replace or repair any sections crushed or collapsed in the course of construction activity. It a section of fence is obstructing vehicular access, relocate it to a spot where it will provide equal protection, but will not obstruct vehicles.

Rock Berm Inspection and Maintenance Guidelines:

1) Inspection shall be made weekly and after each rainfall by contractor.
2) Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved site and un such a manner as to not contribute to additional siltation.
3) Repair any lose wire sheathing.
4) The berm shall be reshaped as needed during inspection.
5) The berm shall be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
6) The rock berm shall be left in place until all upstream areas are stabilized and accumulated silt removed.

Temporary Construction Entrance/Exit:

1) The entrance shall be maintained in a condition, which will prevent tracking or flowing of sediment onto the public rights-of-way.
2) All sediment spilled, dropped, washed or tracked on to public rights-of-way shall be removed immediately by the contractor.
3) When necessary, wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way.
4) When washing is required, it shall be done on an area stabilized with crushed stone that drains into an approved sediment trap.
5) All sediment shall be prevented from entering any storm drain, ditch or water course by using approved methods.

Concrete Truck Washout Pit Inspection and Maintenance Guidelines

1) All concrete spilled, dropped, washed or tracked on to public rights-of-way shall be removed immediately by the contractor.
2) When washing is required, it shall be done on a concrete truck washout pit.
3) The washout pit shall be reshaped, repaired, or replaced as needed during inspection.
4) Avoid mixing of excess amounts of fresh concrete.
5) Do not washout concrete trucks into storm drains, open ditches, streets, or streams.
6) Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
7) Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.

*** For Additional Guidelines on Inspection and Maintenance for Temporary BMP's, refer to the TCEQ Technical Guidance Manual, Sections 1.4.3 "Silt Fences", 1.4.5 "Rock Berms", 1.4.2 "Temporary Construction Entrance/Exit, and 1.4.18 "Concrete Washout Areas".

TEMPORARY CONSTRUCTION ENTRANCE/EXIT

INSPECTION FORM

GENERAL NOTES

1. STONE SIZE - 4 TO 8 INCHES CRUSHED ROCK.

2. LENGTH - AS EFFECTIVE, BUT NOT LESS THAN 50 FEET.

3. THICKNESS - NOT LESS THAN 8 INCHES.

4. WIDTH - NOT LESS THAN 12 FEET.

5. WASHING - WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO THAT NO SEDIMENT LEAVES THE SITE. ALL UNFILTERED SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE.

6. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.

7. DRAINAGE - ENTRANCE MUST BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

INSPECTION REPORT

DATE: _____

SIGNATURE: _____

DOES MUCH SEDIMENT GET TRACKED ONTO ROAD?	IS THE GRAVEL CLEAN OR IS IT FILLED WITH SEDIMENT?	DOES ALL TRAFFIC USE THE STABILIZED ENTRANCE TO LEAVE THE SITE?

MAINTENANCE REQUIRED FOR STABILIZED CONSTRUCTION ENTRANCE:

_____

_____

_____

_____

_____

_____

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

SILT FENCE
INSPECTION FORM

GENERAL NOTES

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT DEEP AND SPACED NOT MORE THAN 8 FEET ON CENTER. WHERE WATER CONCENTRATES, THE MAXIMUM SPACING SHOULD BE 6 FEET.

2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT), WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.

3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED AND COMPACTED.

4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST AND TO WOVEN WIRE, WHICH IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHALL BE A 3 FOOT DOUBLE OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

5. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

6. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

INSPECTION REPORT

DATE:_____

SIGNATURE: _____

IS THE BOTTOM OF THE FABRIC STILL BURIED ?	IS THE FABRIC TORN OR SAGGING ?	ARE THE POSTS TIPPED OVER ?	HOW DEEP IS THE SEDIMENT?

MAINTENANCE REQUIRED FOR SILT FENCE:

_____

_____

_____

_____

_____

TO BE PERFORMED BY:_____ ON OR BEFORE:_____

ROCK BERMS
INSPECTION FORM

GENERAL NOTES:

1. WOVEN WIRE SHEATHING SHALL BE PERPENDICULAR TO THE FLOW LINE AND THE SHEATHING SHALL BE 20 GAUGE WOVEN WIRE MESH WITH 1 INCH OPENINGS.

2. BERM SHALL HAVE A TOP WIDTH OF 2 FEET MINIMUM WITH SIDE SLOPES BEING 2:1 (H:V) OR FLATTER.

3. PLACEMENT OF THE ROCK ALONG THE SHEATHING SHALL NOT BE LESS THAN 18 INCHES.

4. THE WIRE SHEATHING SHALL BE WRAPPED AROUND THE ROCK AND SECURED WITH TIE WIRE SO THAT THE ENDS OF THE SHEATHING OVERLAP AT LEAST 2 INCHES, AND THE BERM RETAINS ITS SHAPE WHEN WALKED UPON.

5 BERM SHALL BE BUILT ALONG THE CONTOUR AT ZERO PERCENT GRADE OR AS NEAR AS POSSIBLE.

6 THE ENDS OF THE BERM SHALL BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHALL BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.

INSPECTION REPORT

DATE: _____

SIGNATURE: _____

IS THE BERM A MINIMUM OF 18 INCHES HIGH ?	IS LEVEL OF SILT GREATER THAN 6 INCHES DEEP?

MAINTENANCE REQUIRED FOR ROCK BERMS:

_____

_____

_____

_____

_____

_____

TO BE PERFORMED BY:_____ ON OR BEFORE:_____

ATTACHMENT J-SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

Temporary Stabilization-No bare ground exposed during construction will be left to stabilize naturally. In any disturbed area where construction activities have ceased, permanently or temporarily, the contractor shall initiate temporary stabilization of the area by the use of seeding and mulching within 14 days, except in areas where construction activities are scheduled to resume within 21 days. The temporary seeding will consist of Green Sprangletop, Buffalo Grass, and Bermuda Grass with straw cedar mulch applied on final layer in accordance with TxDOT Item 164-Seeding for Erosion Control. Depending on the growing season at the time of construction, mixture and application rates may be modified by the engineer.

Permanent Stabilization-Disturbed portions of the site where construction activities permanently cease shall be stabilized with permanent seed no later than 14 days after the last construction activity. The permanent seed mix shall consist of Green Sprangletop, Buffalo Grass, and Bermuda Grass with straw or cedar mulch applied on final layer in accordance with TxDOT Item 164-Seeding for Erosion Control. Depending on the growing season at the time of construction, mixture and application rates may be modified by the engineer. It shall be the contractor's responsibility to provide irrigation for temporary or final stabilization in a manner that will not erode the topsoil, but will sufficiently soak the soil to a depth of six inches. The irrigation may occur at a 10-day interval during the first two months. Rainfall occurrences of 0.5 inches or more should postpone the watering schedule for one week. During drought conditions, the contractor shall continue the watering schedule until 80% vegetative cover is achieved.

Permanent Stormwater Section

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

REGULATED ENTITY NAME: New Braunfels Church of Christ

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

1. X Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.

2. X These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.

   X The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

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

   _____

   _____

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

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

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

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

   X This site will not be used for low density single-family residential development.

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

__ **ATTACHMENT A - 20% or Less Impervious Cover Waiver.** This site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is found at the end of this form.

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

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

6. **ATTACHMENT B - BMPs for Upgradient Stormwater.**

X A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is identified as **ATTACHMENT B** at the end of this form.

__ If no surface water, groundwater or stormwater originates upgradient from the site and flows across the site, an explanation is provided as **ATTACHMENT B** at the end of this form.

__ If permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, an explanation is provided as **ATTACHMENT B** at the end of this form.

7. **ATTACHMENT C - BMPs for On-site Stormwater.**

X A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is identified as **ATTACHMENT C** at the end of this form.

__ If permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, an explanation is provided as **ATTACHMENT C** at the end of this form.

8. X **ATTACHMENT D - BMPs for Surface Streams.** A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is provided at the end of this form. Each feature identified in the Geologic Assessment as "sensitive" has been addressed.

9. X The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.

X The permanent sealing of or diversion of flow from a naturally-occurring "sensitive" or "possibly sensitive" feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed for any naturally-occurring "sensitive" or "possibly sensitive" features on this site.

__ **ATTACHMENT E - Request to Seal Features.** A request to seal a naturally-occurring "sensitive" or "possibly sensitive" feature, that includes a justification as to why no reasonable and practicable alternative exists, is found at the end of this form. A request and justification has been provided for each feature.

10. X **ATTACHMENT F - Construction Plans.** Construction plans and design calculations for the proposed permanent BMPs and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information have been signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed permanent BMPs and measures are provided at the end of this form. Design Calculations, TCEQ

Construction Notes, all man-made or naturally occurring geologic features, all proposed structural measures, and appropriate details must be shown on the construction plans.

11. X **ATTACHMENT G - Inspection, Maintenance, Repair and Retrofit Plan.** A plan for the inspection, maintenance, repair, and, if necessary, retrofit of the permanent BMPs and measures is provided at the end of this form. The plan has been prepared and certified by the engineer designing the permanent BMPs and measures. The plan has been signed by the owner or responsible party. The plan includes procedures for documenting inspections, maintenance, repairs, and, if necessary, retrofits as well as a discussion of record keeping procedures.

12. X The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

— Pilot-scale field testing (including water quality monitoring) may be required for BMPs that are not contained in technical guidance recognized by or prepared by the executive director.

— **ATTACHMENT H - Pilot-Scale Field Testing Plan.** A plan for pilot-scale field testing is provided at the end of this form.

13. X **ATTACHMENT I -Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is provided at the end of this form. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity which increase erosion that results in water quality degradation.

Responsibility for maintenance of permanent BMPs and measures after construction is complete.

14. X The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.

15. X A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.

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

Michael G. Short, P.E.
Print Name of Customer/Agent

Signature of Customer/Agent

10/22/08
Date

Attachment B – BMPs for Upgradient Stormwater

Both Phase 1 and Phase 2 will have upstream runoff entering the site. (See Drainage Area Map) This upstream runoff has been accounted for in the detention pond design. Impervious cover located upstream consists of a few single family residences and has been accounted for in the sand filter system design.

Attachment C – BMPs for Onsite Stormwater

The Best Management Practice used as the permanent control device for The New Braunfels Church of Christ Phase 1 and Phase 2 will be a Sand Filter System. The Sand Filter System has been designed to mitigate all impervious cover onsite and the impervious cover located within the drainage located immediately upstream of our site.

Attachment D – BMPs for Surface Streams

The Best Management Practice used as the permanent control device for The New Braunfels Church of Christ Phase 1 and Phase 2 will be a Sand Filter System. The Sand Filter System has been designed to mitigate all proposed impervious cover onsite. The Sand Filter System will adequately protect the adjacent tributary to Bleider's Creek.

The parking will be graded to slope away from the well located onsite; therefore no new pollutants generated onsite will drain across the existing well.

GRID NORTH

SCALE IN FEET
40 20 0 40

SCALE: 1" = 40'

WINDSOR LN. (66' R.O.W.)

WOODS DR.

LOT 1
BLOCK-3-
NORTHWOODS
UNIT ONE
VOL. 5, PG. 305
M.P.R.

ENDING 30' UTILITY EASEMENT VOL. 5, PG. 305 M.P.R.

S70°06'26"E 632.76'

S70°06'54"E 267.14'

BARBED WIRE FENCE

1/2"IPF

3/8"IPF

1-STORY WOOD BUILDING

WATER TANK

GATE

WELL

CHAIN LINK FENCE

TBM
Cotton Spindle in Wood Power Pole
Elevation = 848.56'

E OH E & T

30' WIDE ELECT. EASE. (VOL. 5, PG. 305 M.P.R.)

BEG. E OH E & T EASEMENT

HEIMER-PREUSSER INC.
REMAINDER OF
100 ACRES
VOL. 250, PGS. 692-694

NOTE:
NO ON-SITE SEWAGE FACILITIES (OSSF) CAN BE CONSTRUCTED WITHIN THIS 150' RADIUS
VOL. 5, PG. 305 M.P.R.

N32°59'59"E 317.59'

30' WIDE ELECT. EASE.

N32°21'59"E 122.75'

6' CHAIN LINK FENCE

N57°10'46"W 270.80'

N32°49'06"E 223.80'

LOT 7
BLOCK-7-
NORTHWOODS
UNIT TWO
VOL. 7, PG. 58

LOT 2
BLOCK -1-
11.573 AC.
CHURCH OF CHRIST
SUBDIVISION
DOC. NO.
M&P.R.

CHURCH OF CHRIST
OF NEW BRAUNFELS, TEXAS
11.306 ACRE TRACT
DOC. NO. 200006037874

SHEEP/GOAT FENCE

N56°57'58"W 286.22'

LOT 7
BLOCK-7-
NORTHWOODS
UNIT TWO
VOL. 7, PG. 58

8" WW

N53°39'27"E 364.87'

U.E. & A.E. DEDICATED BY DOC. NO. 200606008674

SSMH 8224
TOP=+ 833.40
WY IN=+(826.53
INV OUT=+(825.53

LOT 2A
5.601 AC.
LOT 2A AND LOT 2B
BLOCK 1
AND ALYSSA WAY
OAKRUN SCHOOL
SUBDIVISION
UNIT TWO
DOC. NO.
M.P.R.

N21°07'12"E 252.14'

SSMH 8380
TOP=+ 836.71
INV=+(830.30)

TBM
1/2" Iron Rod W/
Plastic Cap
Elevation = 842.44'

8" WW

S46°10'16"E 44.22'

WALKING LINE EASEMENT

SSMH 8370
TOP=+ 839.04
INV=+(834.23)

N80°27'20"W 48.73'

T1 L=392.45'
R=363.00'

ALYSSA WAY
(R.O.W. VARIES)

SSMH 8581
TOP=+ 834.19
INV=+(827.37)

LOT 1
BLOCK -1-
0.982 AC.
CHURCH OF CHRIST
SUBDIVISION
DOC. NO.

NEW BRAUNFELS INVESTMENT
JOINT VENTURE, A TEXAS JOINT VENTURE
8.16 ACRE TRACT
REMAINDER OF 110.25 ACRES
VOL. 449, PG. 161

LEGEND

- IRON PIN FOUND
- SET 1/2" IRON PIN WITH CAP
- TXDOT CONCRETE MONUMENT TYPE II
- SIGN
- WATER VALVE
- FIRE HYDRANT
- TREE (CE=CEDAR ELM, LO=LIVE OAK)
- LAMP POST
- POWER POLE
- ANCHOR GUY WIRE
- E OH E & T — OVERHEAD ELECTRIC
- CLEAN OUT
- A/C AIR CONDITIONER
- CONCRETE ENCASED BOLLARD POST
- (RAIL) METAL HANDRAIL
- SPRINKLER NOZZLE
- H/C HANDICAP PARKING SPACE
- F.F.= FINISHED FLOOR ELEVATION
- TBM@1 TEMPORARY BENCH MARK

REVISIONS

DATE	DESCRIPTION

STATE OF TEXAS
MICHAEL S. SHORT
80015
LICENSED PROFESSIONAL ENGINEER
11/02/09

SITE PLAN
(Existing Condition)

CHURCH OF CHRIST OF NEW BRAUNFELS
NEW BRAUNFELS, TEXAS

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

S-1

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File Name: F:\060109\TXDOT\WPAP\S-1site01.dwg

Thursday, October 22, 2009, 11, 12, AM
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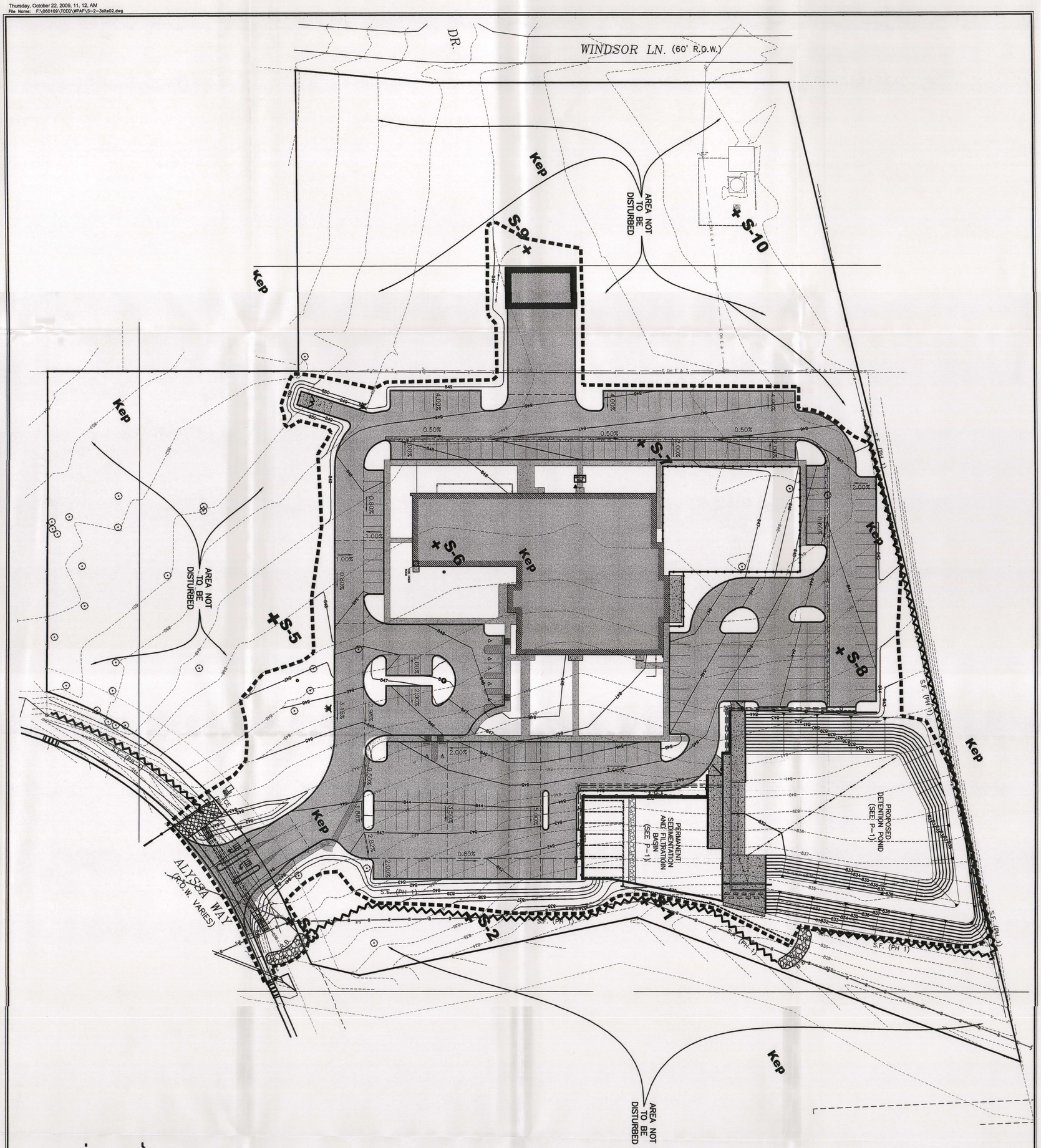


LEGEND:

- PROPOSED BUILDINGS, SIDEWALKS AND PARKING AREAS
- GEOLOGIC FEATURE (SEE GEOLOGICAL SITE ASSESSMENT)
- SILT FENCE (PHASING NOTED)
- ROCK BERM (PHASING NOTED)
- TEMPORARY CONSTRUCTION ENTRANCE/EXIT (PHASING NOTED)
- AREAS TO BE DISTURBED w/SOIL STABILIZATION (WITH SITE CONSTRUCTION PLANS)
- Kep SEE GEOLOGICAL ASSESSMENT

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

SITE PLAN
(Phase 1)

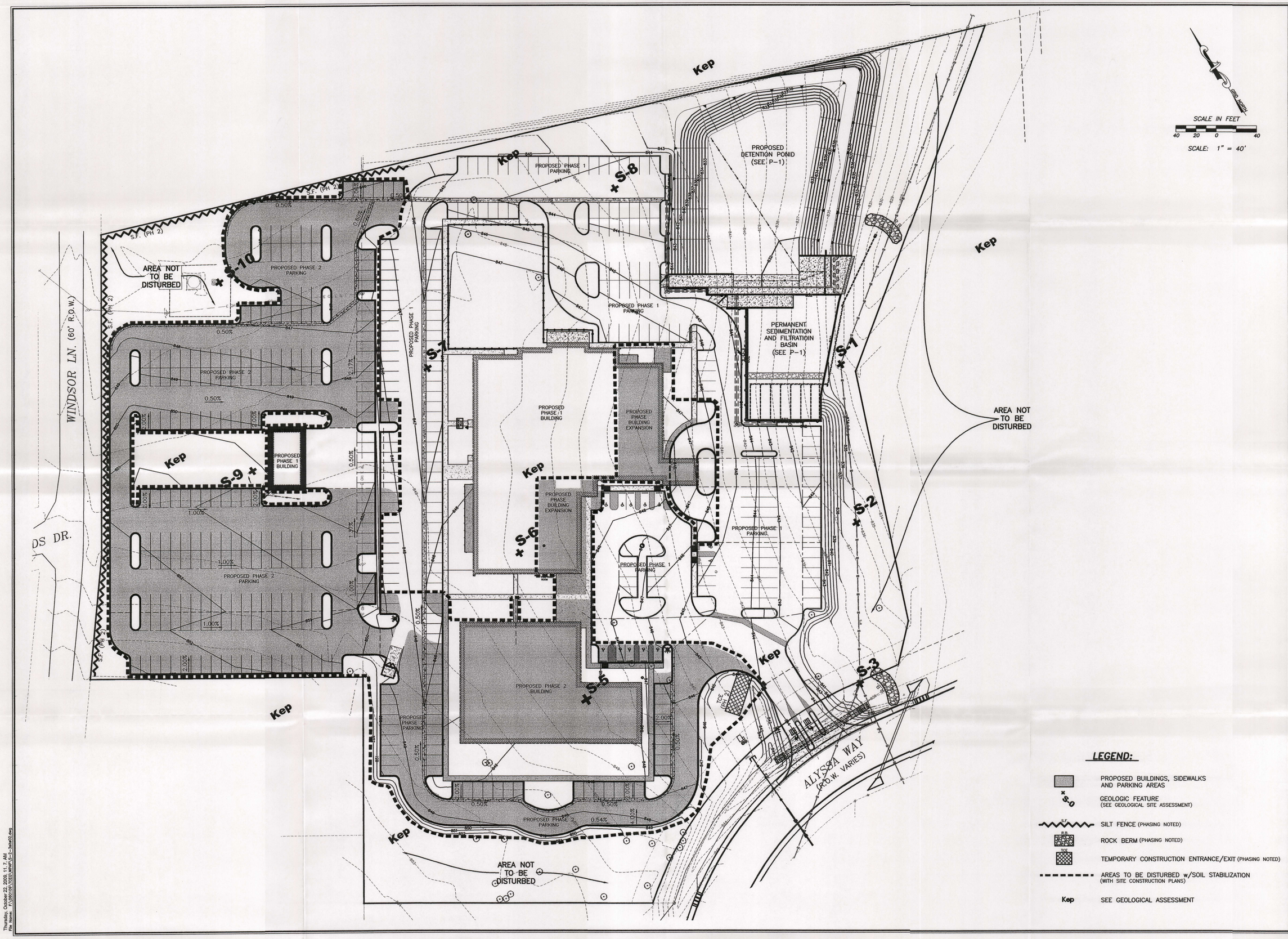
CHURCH OF CHRIST OF NEW BRAUNFELS
NEW BRAUNFELS, TEXAS

STATE OF TEXAS
MICHAEL G. SHORT
88015
LICENSED PROFESSIONAL ENGINEER

REVISIONS	
DATE	DESCRIPTION

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

S-2



LEGEND:

- PROPOSED BUILDINGS, SIDEWALKS AND PARKING AREAS
- S-0 GEOLOGIC FEATURE (SEE GEOLOGICAL SITE ASSESSMENT)
- SILT FENCE (PHASING NOTED)
- ROCK BERM (PHASING NOTED)
- TEMPORARY CONSTRUCTION ENTRANCE/EXIT (PHASING NOTED)
- AREAS TO BE DISTURBED w/SOIL STABILIZATION (WITH SITE CONSTRUCTION PLANS)
- Kep SEE GEOLOGICAL ASSESSMENT

REVISIONS

DATE	DESCRIPTION

SITE PLAN (Phase 2)

CHURCH OF CHRIST OF NEW BRAUNFELS

NEW BRAUNFELS, TEXAS

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

S-3

Thursday, October 22, 2009, 11:7 AM
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Texas Commission on Environmental Quality
Water Pollution Abatement Plan
General Construction Notes

1. Written construction notification must be given to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. Information must include the date on which the regulated activity will commence, the name of the approved plan for the regulated activity, and the name of the prime contractor and the name and telephone number of the contact person.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.

3. If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive feature may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.

4. 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.

5. Prior to commencement of construction, all temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.

6. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

7. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

11. The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.

12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

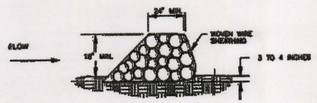
   A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;

   B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;

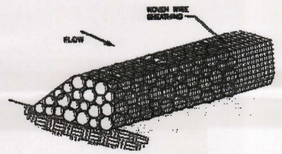
   C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office 1921 Cedar Bend, Suite 150 Austin, Texas 78758-5336 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone (210) 490-3096 Fax (210) 545-4329

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.



CROSS SECTION
N.T.S.



ISOMETRIC PLAN VIEW
N.T.S.

Materials:

(1) The berm structure shall be secured with a woven wire sheathing having maximum opening of 1 inch a minimum wire diameter of 20 gauge galvanized and should be secured with shoot rings.

(2) Clean, open graded 3- to 5-inch diameter rock shall be used.

Installation:

(1) Lay out the woven wire sheathing perpendicular to the flow line. The sheathing shall be 20 gauge woven wire mesh with 1 inch opening.

(2) Berm shall have a top width of 2 feet minimum with side slopes being 2:1 (H:V) or flatter.

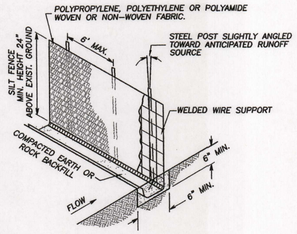
(3) Place the rock along the sheathing as shown in the Rock Berm Detail to a height not less than 18".

(4) Wrap the wire sheathing around the rock and secure with tie wire so that the ends of the sheathing overlap at least 2 inches, and the berm retains its shape when walked upon.

(5) Berm shall be built along the contour at zero percent grade or as near as possible.

(6) The ends of the berm shall be tied into existing upslope grade and the berm shall be buried in a trench approximately 3 to 4 inches deep to prevent failure of the control.

ROCK BERM DETAIL
N.T.S.



Materials:

(1) Silt fence material shall be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in², ultraviolet stability exceeding 70%, and minimum apparent opening size of U.S. Sieve No. 30.

(2) Fence posts shall be made of hot rolled steel, at least 4 feet long with Tee or Y-bar cross section, surface painted or galvanized, minimum nominal weight 1.25 lb/ft , and Brindell hardness exceeding 140.

(3) Welded wire backing to support the fabric shall be galvanized 2" x 4" welded wire, 12 gauge minimum.

Installation:

(1) Steel posts, which support the silt fence, shall be installed on a slight angle toward the anticipated runoff source. Post must be embedded a minimum of 1 foot deep and spaced not more than 6 feet on center.

(2) Lay out fencing down-slope of disturbed area, following the contour as closely as possible. The fence shall be sited so that the maximum drainage area is 1/4 acre/100 feet of fence.

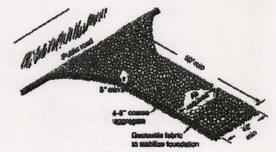
(3) The toe of the silt fence shall be trenched in with a spade or mechanical trencher, so that the down-slope face of the trench is flat and perpendicular to the line of flow. Where fence cannot be trenched in (e.g., pavement or rock outcrop), weight fabric flap with 3 inches of pea gravel on uphill side to prevent flow from seeping under fence.

(4) The trench must be a minimum of 6 inches deep and 6 inches wide to allow for the silt fence fabric to be laid in the ground and backfilled with compacted material.

(5) Silt fence shall be securely fastened to each steel support post or to woven wire, which is in turn attached to the steel fence post. There shall be a 3-foot overlap, securely fastened where ends of fabric meet.

(6) Silt fence shall be removed when the site is completely stabilized so as not to block or impede storm flow drainage.

SILT FENCE
N.T.S.



Cross-section of a Construction Entrance/Exit

Materials:

(1) The aggregate shall consist of 4 to 8 inch washed stone over a stable foundation as specified in the plan.

(2) The aggregate shall be placed with a minimum thickness of 8 inches.

(3) The geotextile fabric shall be designed specifically for use as a soil filtration media with an approximate weight of 6 oz/yd², a mullen burst rating of 140 lb/in², and an equivalent opening size greater than a number 50 sieve.

(4) If vehicle(s) require washing, a washing facility with a level area and a minimum of 4 inch washed stone or commercial rock shall be constructed in an approved area. Divert wastewater to sedimentation controlled areas.

Installation:

(1) Remove vegetation and other objectionable material from the foundation area. Grade crown foundation for positive drainage.

(2) The minimum width of the entrance/exit shall be 12 feet or the the full width of exit roadway, whichever is greater.

(3) The construction entrance shall be at least 50 feet long.

(4) If the slope toward the road exceeds 2%, construct a ridge, 6 to 8 inches high with 3 : 1 (H:V) side slopes, across the foundation approximately 15 feet from the entrance to divert runoff away from the public road.

(5) Place geotextile fabric and grade foundation to improve stability, especially where wet conditions are anticipated.

(6) Place stone to dimensions and grade shown on plans. Leave surface smooth and slope for drainage.

(7) Divert all surface runoff and drainage from the stone pad to sedimentation controlled areas.

(8) Top of Temporary Construction Entrance/Exits Shall Project no more than 4" above Natural Ground.

TEMPORARY CONSTRUCTION ENTRANCE/EXIT
N.T.S.

REVISIONS

DATE	DESCRIPTION

STATE OF TEXAS
MICHAEL G. SHORT
80513
LICENSED PROFESSIONAL ENGINEER
10/16/09

EROSION CONTROL PLAN & GENERAL NOTES

CHURCH OF CHRIST OF NEW BRAUNFELS
NEW BRAUNFELS, TEXAS

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

S-4

Thursday, October 22, 2009, 10:16 AM
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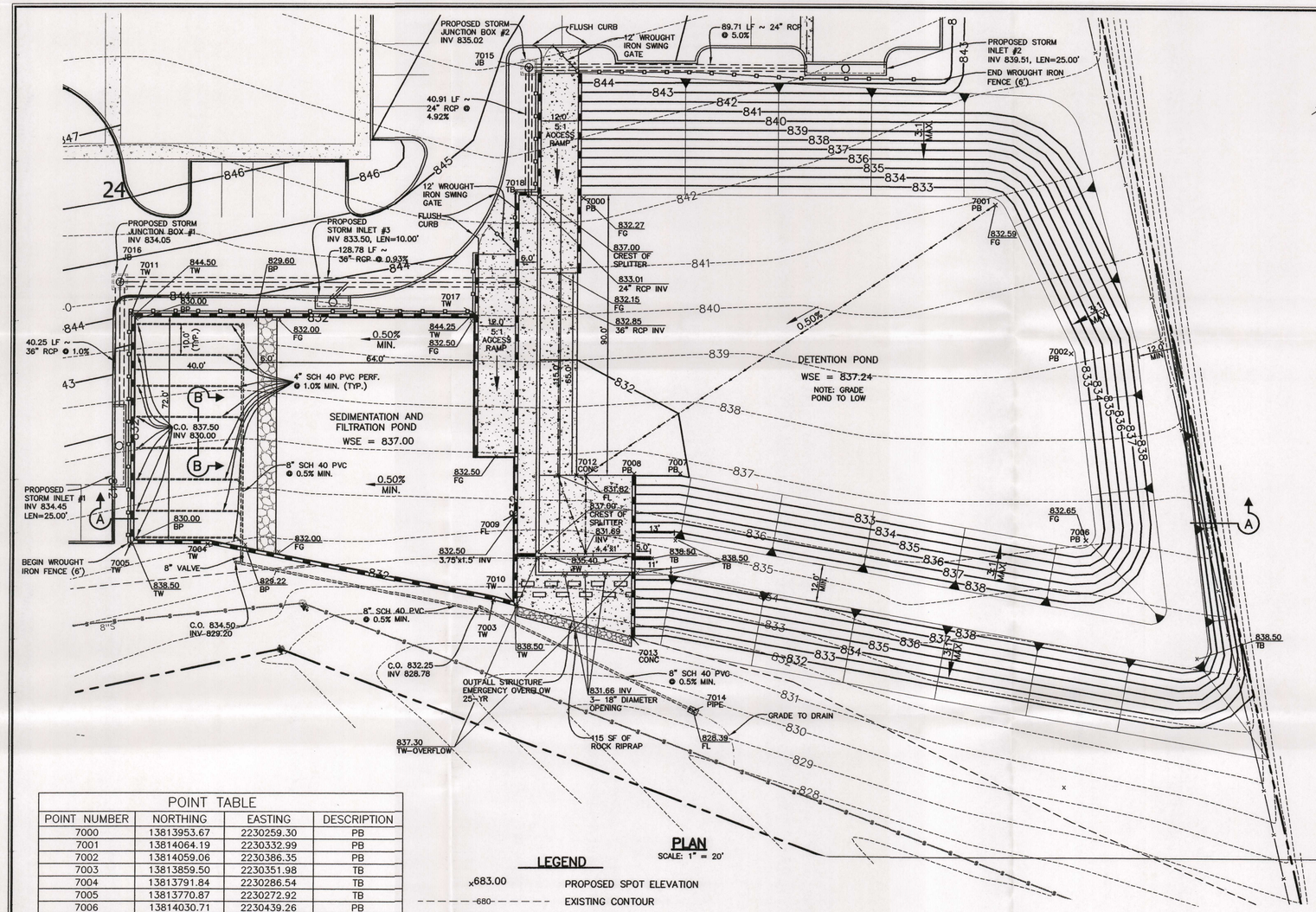
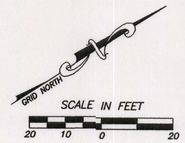


PLAN
SCALE: 1" = 20'

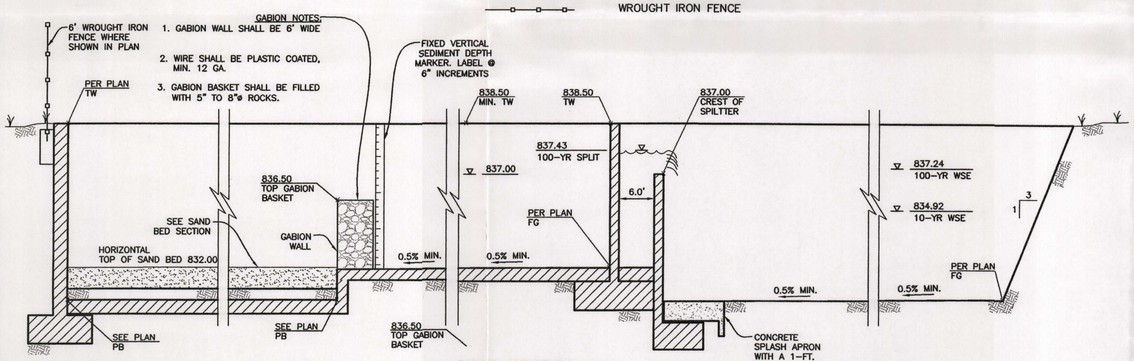


POINT TABLE			
POINT NUMBER	NORTHING	EASTING	DESCRIPTION
7000	13813953.67	2230259.30	PB
7001	13814064.19	2230332.99	PB
7002	13814059.06	2230386.35	PB
7003	13813859.50	2230351.98	TB
7004	13813791.84	2230286.54	TB
7005	13813770.87	2230272.92	TB
7006	13814030.71	2230439.26	PB
7007	13813932.08	2230350.53	PB
7008	13813919.46	2230342.67	PB
7009	13813880.04	2230332.49	FL
7010	13813829.28	2230269.28	FL
7011	13813811.17	2230210.86	TB
7012	13813903.62	2230332.90	CONC
7013	13813890.40	2230386.31	CONC
7014	13813894.41	2230417.12	PIPE
7015	13813961.50	2230214.39	JB
7016	13813810.59	2230208.24	JB
7017	13813904.27	2230271.32	TB
7018	13813936.41	2230245.69	TB

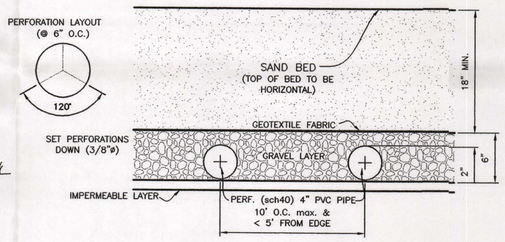
LEGEND

x683.00	PROPOSED SPOT ELEVATION
680	EXISTING CONTOUR
680	PROPOSED CONTOUR
	FLOW DIRECTION
TC	TOP OF CURB
FL	FLOWLINE
FG	FINISH GRADE
FL-HP	FLOWLINE @ HIGH POINT
INV	INVERT
WSE	WATER SURFACE ELEVATION
GB-HP	GRADE BREAK @ HIGH POINT
GB	GRADE BREAK
[000.00]	APPROXIMATE SPOT GRADE
	CONCRETE RETAINING WALL
	WROUGHT IRON FENCE

SPOT ELEVATION LEGEND		
PB	=	POND BOTTOM
TB	=	TOP OF BANK
TOC	=	TOP OF CONCRETE
TW	=	TOP OF WALL
C.O.	=	CLEANOUT
INV.	=	INVERT
TOS	=	TOP OF SAND
JB	=	JUNCTION BOX
CONC	=	CONCRETE
FG	=	FINISH GRADE



POND SECTION A-A
N.T.S.



SAND BED PROFILE B-B
(WITH GRAVEL FILTER)

Table 3.6 Geotextile Fabric Specifications (COA, 1997)

Property	Test Method	Unit	Specification (min.)
Unit Weight		oz/yd^{-2}	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D-1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

*modified

SAND BED WITH GRAVEL LAYER NOTES:
THE TOP LAYER IS TO BE A MINIMUM OF EIGHTEEN (18) INCHES OF 0.02-0.04 INCH DIAMETER SAND WHICH CORRESPOND WITH ASTM C-33 CONCRETE SAND (SMALLER SAND SIZE IS NOT ACCEPTABLE). UNDER THE SAND SHALL BE A LAYER OF ONE-HALF (0.5) TO ONE AND ONE-HALF (1.5) INCH DIAMETER WASHED, ROUNDED, RIVER GRAVEL WHICH PROVIDES A MINIMUM OF TWO (2) INCHES OF COVER OVER THE TOP OF THE UNDERDRAIN LATERAL PIPES. THE SAND AND GRAVEL MUST BE SEPARATED BY A LAYER OF GEOTEXTILE FABRIC MEETING THE SPECIFICATIONS LISTED IN TABLE 3.6 "GEOTEXTILE FABRIC SPECIFICATIONS (COA, 1997). THE GEOTEXTILE FABRIC SHALL MEET THE SPECIFICATIONS LISTED IN TABLE 3.6 TAKEN FROM THE TNRCC TECHNICAL GUIDANCE ON BEST MANAGEMENT PRACTICES, JUNE 1999.

NOTE:
SEE STRUCTURAL PLANS AND STRUCTURAL DETAILS FOR ALL WALLS AND FLOORS OF SEDIMENTATION/FILTRATION BASIN, SPLITTER AND OUTFALL STRUCTURES.

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Proposed Conditions Phase II
Date Prepared: 8/17/2009

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

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

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

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

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

County =	Comal	
Total project area included in plan * =	11.58	acres
Predevelopment impervious area within the limits of the plan * =	0.02	acres
Total post-development impervious area within the limits of the plan* =	6.74	acres
Total post-development impervious cover fraction * =	0.58	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6035	lbs.

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

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

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	13.60	acres
Predevelopment impervious area within drainage basin/outfall area =	0.50	acres
Post-development impervious area within drainage basin/outfall area =	7.24	acres
Post-development impervious fraction within drainage basin/outfall area =	0.53	
$L_{M\ THIS\ BASIN}$ =	6050	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Sand Filter
Removal efficiency = 89 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	9.30	acres
A_I =	6.75	acres
A_P =	2.55	acres
L_R =	6900	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	6035	lbs.
F =	0.87	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	1.44	inches
Post Development Runoff Coefficient =	0.5326	
On-site Water Quality Volume =	26891	cubic feet

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

Off-site area draining to BMP =	4.30	acres
Off-site Impervious cover draining to BMP =	0.50	acres
Impervious fraction of off-site area =	0.12	
Off-site Runoff Coefficient =	0.1391	
Off-site Water Quality Volume =	3126	cubic feet
Storage for Sediment =	5804	
Total Capture Volume (required water quality volume(s) x 1.20) =	34821	cubic feet

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

7. Retention/Irrigation System Designed as Required in RG-348 — Pages 3-42 to 3-46

Required Water Quality Volume for retention basin = NA cubic feet

Irrigation Area Calculations:

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

8. Extended Detention Basin System Designed as Required in RG-348 — Pages 3-46 to 3-51

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

9. Filter area for Sand Filters Designed as Required in RG-348 — Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin =	34821	cubic feet	
Minimum filter basin area =	1438	square feet	
Maximum sedimentation basin area =	12946	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	3236	square feet	For maximum water depth of 8 feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	34821	cubic feet	
Minimum filter basin area =	2589	square feet	
Maximum sedimentation basin area =	10357	square feet	For minimum water depth of 2 feet
Minimum sedimentation basin area =	647	square feet	For maximum water depth of 8 feet

REVISIONS		
DATE	DESCRIPTION	

STATE OF TEXAS — MICHAEL G. GROGHT — 85978 — LICENSED PROFESSIONAL ENGINEER — 10/14/09

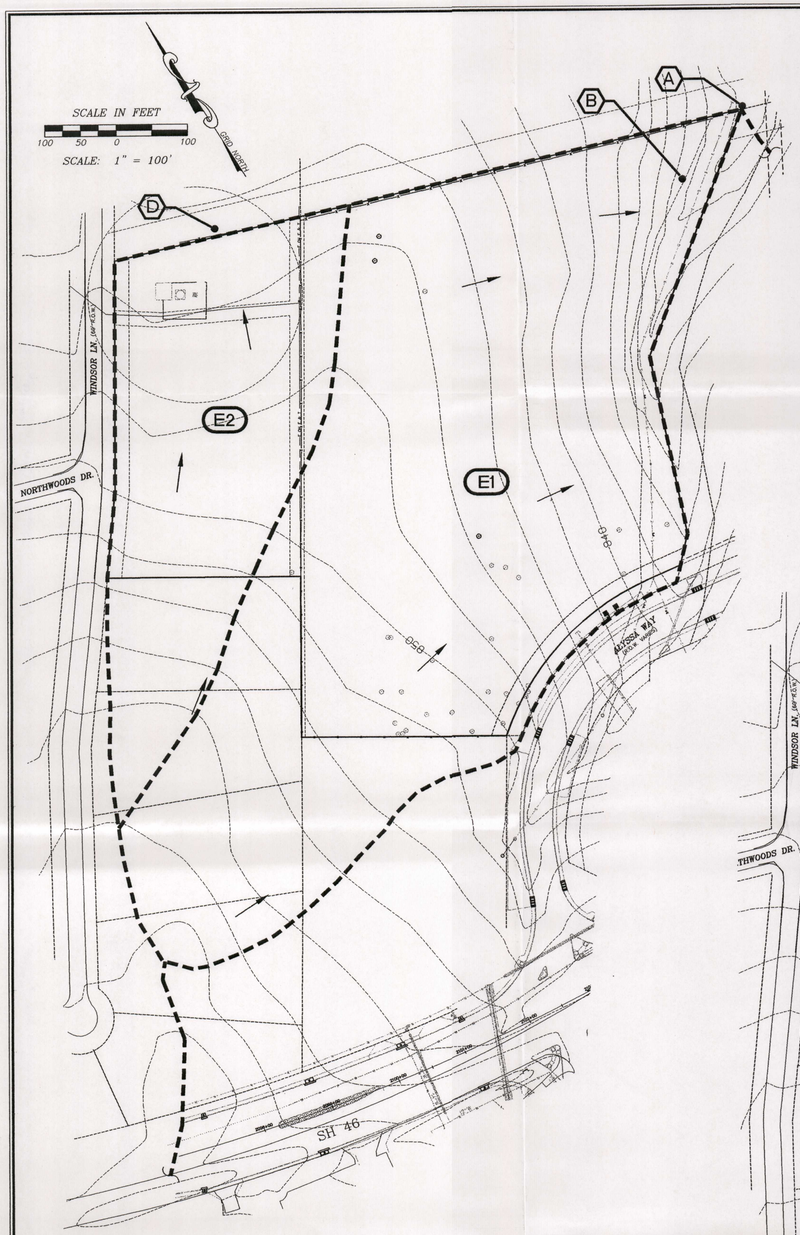
SEDIMENTATION, FILTRATION & DETENTION POND PLAN & DETAILS
CHURCH OF CHRIST OF NEW BRAUNFELS
NEW BRAUNFELS, TEXAS

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM LA00069-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

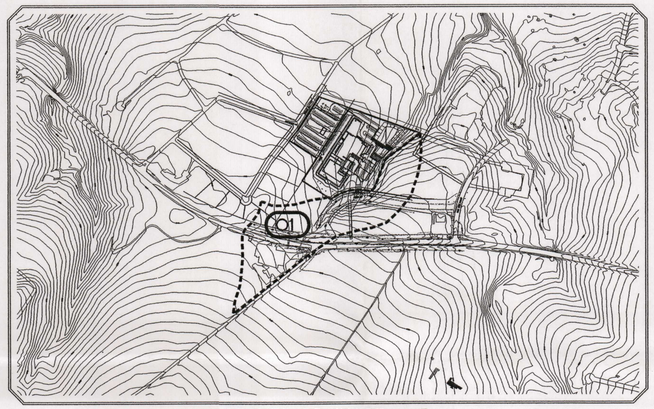
DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

P-1

Thursday, October 22, 2009, 11:4 AM
File Name: P:\060109\Sheets\grd01.dwg

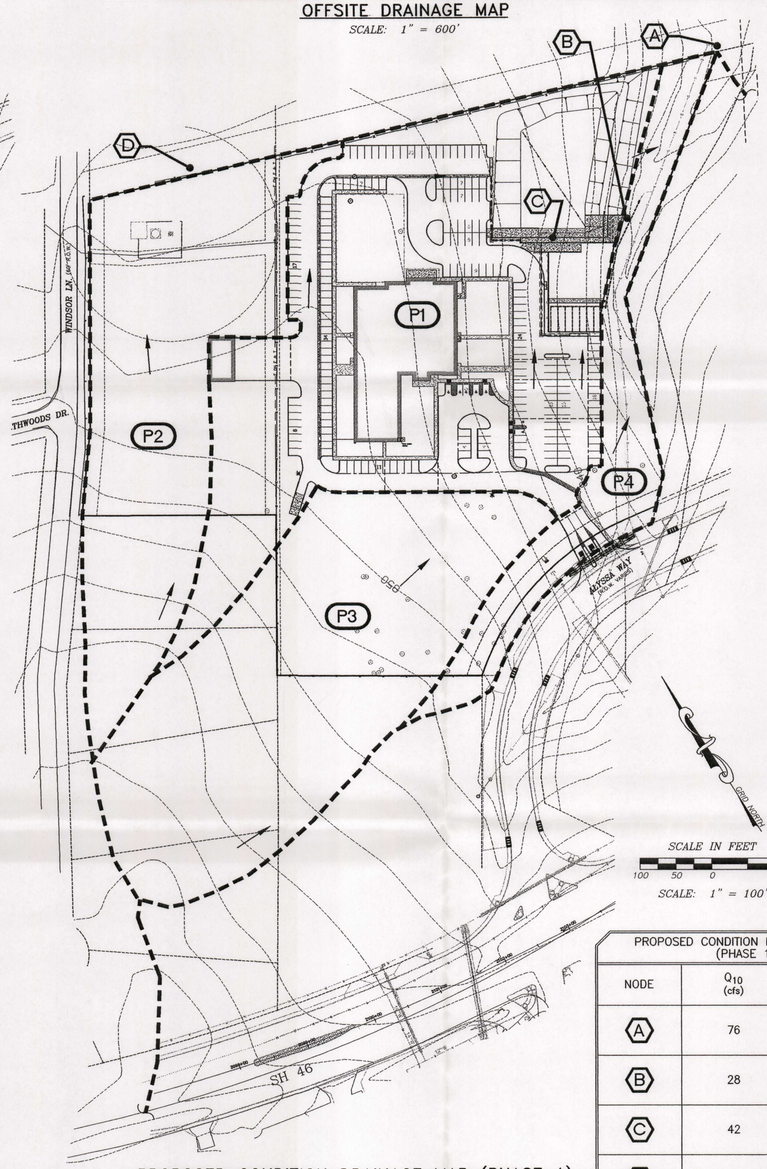


EXISTING CONDITION DRAINAGE MAP

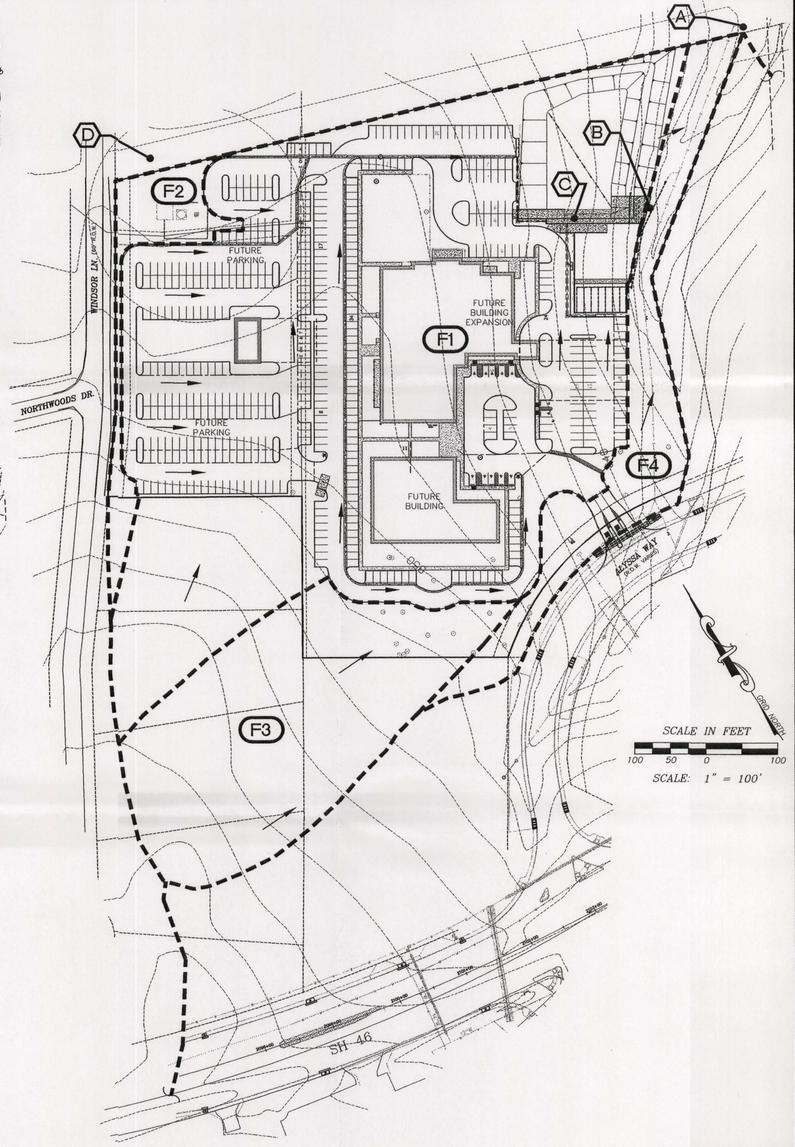


OFFSITE DRAINAGE MAP

SCALE: 1" = 600'



PROPOSED CONDITION DRAINAGE MAP (PHASE 1)



FUTURE CONDITION DRAINAGE MAP (PHASE 2)

EXISTING CONDITION NODE SUMMARY		
NODE	Q_{10} (cfs)	Q_{100} (cfs)
A	82	165
B	38	79
D	13	27

DRAINAGE AREA SUMMARY			
LOCATION	AREA (AC.)	Q_{10} (cfs)	Q_{100} (cfs)
E1	11.6	38	79
E2	4.0	13	27
P1	6.4	26	49
P2	3.3	10	22
P3	4.3	16	32
P4	1.5	5	10
F1	10.8	42	77
F2	0.5	2	4
F3	2.8	10	21
F4	1.4	5	10
O1	16.4	48	95

PROPOSED CONDITION NODE SUMMARY (PHASE 1)		
NODE	Q_{10} (cfs)	Q_{100} (cfs)
A	76	156
B	28	60
C	42	80
D	10	22

FUTURE CONDITION NODE SUMMARY (PHASE 2)		
NODE	Q_{10} (cfs)	Q_{100} (cfs)
A	80	162
B	33	67
C	52	97
D	2	4

LEGEND

- DRAINAGE AREA BOUNDARY
- X DRAINAGE AREA
- PROPOSED DRAINAGE FLOW
- A DRAINAGE NODE POINT
- ----648---- EXISTING CONTOUR

REVISIONS

DATE	DESCRIPTION

STATE OF TEXAS
MICHAEL G. SHORT
88015
LICENSED
PROFESSIONAL ENGINEER
10/22/09

DRAINAGE AREA MAP FOR CHURCH OF CHRIST OF NEW BRAUNFELS

NEW BRAUNFELS, TEXAS

THE Schultz Group, INC.
TEXAS REGISTERED ENGINEERING FIRM F-532
TEXAS LICENSED SURVEYING FIRM 100059-00
CONSULTING ENGINEERS & LAND SURVEYORS
2461 LOOP 337 NEW BRAUNFELS, TEXAS 78130
PHONE (830) 606-3913 FAX (830) 625-2204

DRAWN BY: D.C.
CHECKED BY: M.G.S.
DATE: AUGUST 2009
JOB NO.: 060109

D-1

Thursday, October 22, 2009, 10:19 AM
File Name: F:\060109\Sheets\dcm01.dwg

Attachment G - Inspection, Maintenance, Repair, and Retrofit Plan

Sedimentation Basin:

Monthly:	The vegetative growth in the basin shall be checked. The growth shall not exceed 18 inches in height.
Quarterly:	The level of accumulated silt shall be checked. If depth of silt exceeds 6 inches, it shall be removed and disposed of "properly".
Annually:	The basin shall be inspected for structural integrity and repaired if necessary.
After Rainfall:	The basin shall be checked after each rainfall occurrence to insure that it drains within 24 hours after the storm is over. If it does not drain within this time, corrective maintenance will be accomplished.

Filtration Basins:

Monthly:	The vegetative growth shall be checked. Vegetation in the basin shall not exceed 18 inches in height.
Quarterly:	The level of accumulated silt shall be checked. If depth of silt/pollutants exceeds ½ inch, it shall be removed and disposed of "properly". The accumulation of pollutants/oils shall be checked. If the pollutants have significantly reduced the designed capacity of the sand filter, the pollutants shall be removed. The basin shall be checked for accumulation of debris and trash. The debris and trash shall be removed if excessive. All debris and trash shall be removed at least every six months. Annually: The basin shall be inspected for structural integrity and repaired if necessary.
After Rainfall:	The basin shall be checked after each rainfall occurrence to insure that it drains within 24 hours after the sedimentation basin has been emptied. If it does not drain within this time, corrective maintenance will be accomplished.

Following any required maintenance, the surface of the filtration basin shall be raked and leveled to restore the system to its designed condition.

"Proper" disposal of accumulated silt shall be accomplished following the Texas Commission of Environmental Quality guidelines and specifications.

An amended copy of this document will be provided to the Texas Commission of Environmental Quality (San Antonio Region) within thirty (30) days of any changes in the following information.

Contact Person:	Glendon Eppler
Entity:	New Braunfels Church of Christ
Mailing Address:	1665 Business Loop 35 South
City, State:	New Braunfels, Texas Zip: 78130
Telephone:	(830) 625-3520
Fax:	

Glendon D. Eppler, Chairman
Signature of Responsible Party

Building Committee

OCT. 15, 2009
Date

Attachment I – Measures for Minimizing Surface Stream Contamination

The Best Management Practice used as the permanent control device for The New Braunfels Church of Christ Phase 1 and Phase 2 will be a Sand Filter System. The Sand Filter System has been designed to mitigate all proposed impervious cover onsite. The Sand Filter System will adequately protect the tributary to Bleider's Creek from surface stream contamination.

Agent Authorization Form

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

I Glendon Eppler,
Print Name

Chairman of Building Committee New Braunfels Church of Christ,
Title - Owner/President/Other

of New Braunfels Church of Christ,
Corporation/Partnership/Entity Name

have authorized Michael G. Short, P.E.
Print Name of Agent/Engineer

of The Schultz Group, 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 plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For applicants who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

Brendon D. Fyffe — July 23 2009
Applicant's Signature — Date
for The Church of Christ of New Braunfels

THE STATE OF Texas §
County of Comal §

BEFORE ME, the undersigned authority, on this day personally appeared _____ 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 23rd day of July, 2009.

Victoria Casarez
NOTARY PUBLIC

VICTORIA CASAREZ
Notary Public, State of Texas
My Commission Expires
February 05, 2011

Victoria Casarez
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 02/05/11

Application Fee Form

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Application Fee Form

NAME OF PROPOSED REGULATED ENTITY: New Braunfels Church of Chirst
REGULATED ENTITY LOCATION: North side of the intersection of State Hwy 46 and State Hwy 1863 in New Braunfels, Texas. Located approximately 1.5 miles west of Loop 337

NAME OF CUSTOMER: New Braunfels Church of Christ
CONTACT PERSON: Glendon Eppler PHONE: (830) 980-7842
(Please Print)

Customer Reference Number (if issued): CN _____ (nine digits)

Regulated Entity Reference Number (if issued): RN **104726906** (nine digits)

Austin Regional Office (3373) ☐ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362) ☐ Bexar ☒ Comal ☐ Medina ☐ Kinney ☐ Uvalde

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

☐ **Austin Regional Office**

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

☒ **San Antonio Regional Office**

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

Site Location (Check All That Apply): ☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	11.726 Acres	$6500.00
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature

10/22/09
Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Application Fee Schedule
30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications
Contributing Zone Plans and Modifications

PROJECT	PROJECT AREA IN ACRES	FEE
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

PROJECT	COST PER LINEAR FOOT	MINIMUM FEE MAXIMUM FEE
Sewage Collection Systems	$0 50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

PROJECT	COST PER TANK OR PIPING SYSTEM	MINIMUM FEE MAXIMUM FEE
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

PROJECT	FEE
Exception Request	$500

Extension of Time Requests

PROJECT	FEE
Extension of Time Request	$150

CHURCH OF CHRIST OF NEW BRAUNFELS
BUILDING ACCOUNT
PH. 830-625-3520
1665 BUSINESS LOOP 35 SOUTH
NEW BRAUNFELS, TX 78130

1020

88-452/1131

5-31-09
DATE

PAY TO THE ORDER OF TCEQ $ 6,500.00

SIX THOUSAND FIVE HUNDRED DOLLARS

STATE BANK
P.O. Box 310669 New Braunfels, TX 78131

FOR

James L Callahan

⑈113104521⑈ ⑆67⑆47515⑈ 1020

Core Data Form

TCEQ Use Only

TCEQ Core Data Form

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

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided)*

☒ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Attachments **Describe Any Attachments:** *(ex. Title V Application, Waste Transporter Application, etc.)*

☒ Yes ☐ No — New Braunfels Church of Christ WPAP Application

3. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	4. Regulated Entity Reference Number *(if issued)*
CN 602892564		RN 104726906

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy)

6. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check only one of the following:*

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other: _____

7. General Customer Information

☒ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State) ☐ No Change**

If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.

8. Type of Customer:			
	☒ Corporation	☐ Individual	☐ Sole Proprietorship- D.B.A
☐ City Government	☐ County Government	☐ Federal Government	☐ State Government
☐ Other Government	☐ General Partnership	☐ Limited Partnership	☐ Other:

9. Customer Legal Name *(If an individual, print last name first: ex: Doe, John)* — *If new Customer, enter previous Customer below* — *End Date:*

New Braunfels Church of Christ

10. Mailing Address: 1665 Business Loop 35 South

City	New Braunfels	State	TX	ZIP	78130	ZIP + 4	

11. Country Mailing Information *(if outside USA)*

12. E-Mail Address *(if applicable)*

13. Telephone Number	14. Extension or Code	15. Fax Number *(if applicable)*
(830) 625-3520		(830) 625-2204

16. Federal Tax ID *(9 digits)*	17. TX State Franchise Tax ID *(11 digits)*	18. DUNS Number *(if applicable)*	19. TX SOS Filing Number *(if applicable)*

20. Number of Employees

☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

21. Independently Owned and Operated?

☒ Yes ☐ No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information ☐ No Change** *(See below)*

**If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.

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

New Braunfels Church of Christ

24. Street Address of the Regulated Entity: *(No P.O. Boxes)*								
	City		State		ZIP		ZIP + 4	
25. Mailing Address:	1665 Business Loop 35 South							
	City	New Braunfels	State	TX	ZIP	78130	ZIP + 4	

26. E-Mail Address:		
27. Telephone Number	28. Extension or Code	29. Fax Number *(if applicable)*
(830) 625-3520		( ) -

30. Primary SIC Code (4 digits)	31. Secondary SIC Code (4 digits)	32. Primary NAICS Code (5 or 6 digits)	33. Secondary NAICS Code (5 or 6 digits)
8661		813110	

34. What is the Primary Business of this entity? *(Please do not repeat the SIC or NAICS description.)*

Religious Organization

Questions 34 – 37 address geographic location. Please refer to the instructions for applicability.

35. Description to Physical Location:	North side of the intersection of State Hwy 46 and State Hwy 1863 in New Braunfels, Texas. Located approximately 1.5 miles west of Loop 337.

36. Nearest City	County	State	Nearest ZIP Code
New Braunfels	Comal	TX	78130

37. Latitude (N) In Decimal:	29.723595		38. Longitude (W) In Decimal:	-98.177336	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	43	24.9414	-98	10	38.409

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
☐ New Source Review – Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS	☐ Sludge
☒ Stormwater	☐ Title V – Air	☐ Tires	☐ Used Oil	☐ Utilities
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Michael G. Short, P.E.	41. Title:	Senior Engineer

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(830) 606-3913		(830) 625-2204	mshort@schultzgroupinc.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 9 and/or as required for the updates to the ID numbers identified in field 39.

(See the Core Data Form instructions for more information on who should sign this form.)

Company:	The Schulz Group, Inc.	Job Title:	Senior Engineer
Name *(In Print)* :	Michael G. Short, P.E.	Phone:	(830) 606-3913
Signature:		Date:	10/22/09

Reference

TCEQ
Protecting Texas by Reducing and Preventing Pollution

FAX TRANSMITTAL

DATE: July 17, 2009 NUMBER OF PAGES *(including this cover sheet)*: 8

TO:
Name: **Shawn Shorn**
Organization: **Schultz Group**
FAX Number: **830-625-2204**

FROM: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Name: **Alan G. Jones**
Division/Region: **San Antonio Region**
Telephone Number: **(210) 403-4074 (Operator @ 210-490-3096)**
FAX Number: **(210) 545-4329**

NOTES:

Church of Christ of New Braunfels, EAPP No. 2377.00

File letters dated 9/22/2008 and 7/18/2006 are attached.

Buddy Garcia, *Chairman*
Larry R. Soward, *Commissioner*
Bryan W. Shaw, Ph.D., *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 22, 2008

Mr. Glendon Eppler
New Braunfels Church of Christ
1665 S. Business Loop 35
New Braunfels, TX 78130

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ; Located on the north side of State Highway 46 at the intersection with SH 1863; New Braunfels, TX
Request for Information Regarding the Edwards Aquifer Protection Program; 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
EAPP File No:

Dear Mr. Eppler:

The San Antonio Regional Office received your request via electronic mail (e-mail) on September 15, 2008 on behalf of New Braunfels Church of Christ and the above-referenced site. The e-mail asked Texas Commission on Environmental Quality (TCEQ) to consider an extension of time for the expired water pollution abatement plan (WPAP) and/or to waive the application fee for a future modification submittal. However, based on the rules and regulations of the Texas Administrative Code, specifically those found within Chapter 213, Subchapter A, the TCEQ cannot grant the request.

The approved protection plan for the site has expired, therefore an extension request cannot be authorized as specified in §213.4(h)(4). Additionally, it appears that the site layout will be different from what was originally approved due to circumstances explained in the email. An extension request cannot be approved if the regulated activities or the approved plan has changed as described in §213.4(h)(5). Since changes to an approved plan can affect the permanent best management practices and potentially endanger the Edwards Aquifer, the TCEQ cannot make an exception to this rule.

The application fee per §213.12 is an administrative item and must be included with an Edwards Aquifer protection plan application or the application can not be accepted for review. The TCEQ can not make an exception to the application fee rule.

A new WPAP must be approved by the Executive Director of the TCEQ before any regulated activities can begin at the site. Failure to receive approval before starting regulated activities could result in enforcement actions.

If you or members of your staff have any questions, please feel free to contact Ms. Charlyne Fritz in the San Antonio Region Office at (210) 403-4065.

Sincerely,

Thomas G. Haberle
Water Section Manager
TCEQ San Antonio Region Office

TGH/CEF/eg

Kathleen Hartnett White, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Larry R. Soward, *Commissioner*
Glenn Shankle, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 18, 2006

Mr. Glendon Eppler
New Braunfels Church of Christ
1665 Business Loop 35 South
New Braunfels TX 78130

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ; Located on the North side of State Hwy 46 at the intersection with State Hwy 1863, West of Loop 337, in the City of New Braunfels
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer, Edwards Aquifer Protection Program ID No. 2377.00, Investigation No: 487096, Regulated Entity No. RN104726906

Dear Mr. Eppler:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the referenced project submitted to the San Antonio Regional Office by John Luce Consulting Engineers, on behalf of New Braunfels Church of Christ on July 25, 2005. Final review of the WPAP submittal was completed after additional material was received on January 25, 2006 and June 8, 2006. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed, and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed project will have an area of 11.306 acres. The proposed development will include 1 building, the church auditorium, totaling 32,725 square feet. Associated parking, driveways and sidewalks represent an addition 128,170 square feet. The impervious cover will be 3.64 acres (32.1 percent). Project wastewater will be disposed of by conveyance to the existing Gruene Sewage Treatment Plant.

PERMANENT POLLUTION ABATEMENT MEASURES

Two systems will be constructed to treat stormwater runoff from the site. The individual treatment measures will consist of a vegetative filter strip (VFS) and a sand filtration basin (SFB) to treat drainage areas A and B. Drainage area C was identified in the plan but will be untreated. Details below:

A. Drainage Area A = the area draining to the vegetative filter strips
B. Drainage Area B = the area draining to the sedimentation filtration basin
C. Drainage Area C = the remainder of the project site and associated drainage. This drainage has no impervious cover on-site.

Drainage Area/ Watershed	Total Area (acres)	On-site Watershed (acres)	Off-site Imp. Cover (acres)	On-site Imp. Cover (acres)	Calc. Min. Capture Volume (ft^3)	Design Capture Volume (ft^3)	Calc. Min. Filter Area (ft^2)	Design Filter Area (ft^2)	Target TSS Load Removal (lb/yr)	Design TSSLoad Removal (lb/yr)
A (VFS)	2.46	2.46	0.00	1.13	7,209	n/a	26,746	29,581	1,014	1,117
B (SFB)	8.85	5.31	2.69	2.51	11,374	12,605	1,137	2,748	2,253	2,831
C untreated	5.30	3.50	0.05	0.00	0	0	0	0	0	0
Total	16.61	11.27	2.74	3.64					3,267	3,948

Area A: The engineered Vegetative Filter Strips are designed in accordance with the 1999 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices," to treat 1,117 pounds of TSS, generated from the 2.46 acres in the drainage area, of which 1.13 acres are on-site impervious cover. The filtration area will consist of 29,581square feet of vegetation.

Area B: The Sand Filter System is designed in accordance with the 1999 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices," to treat 2,831 pounds of TSS, and is sized to capture the first 1.44 inches of stormwater run-off from 8.85 acres. The system will provide a total capture volume of 12,605 cubic feet and a sand filter area of 2,748 square feet.

The approved measures are presented to meet the required 80 percent removal of the increased load in total suspended solids caused by the project.

GEOLOGY

According to the geologic assessment included with the application, there are ten geologic features located on the project site. There were no features assessed as sensitive. The San Antonio Regional Office did not conduct a site investigation.

SPECIAL CONDITIONS

I. The engineered Vegetative Filter Strips are designed in accordance with the 1999 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices." Two years after initial certification, as described in standard condition #14, a Texas Licensed Professional Engineer shall certify in writing that the vegetative filter strips continue to function properly, channelization has not occurred, and that the entire area designated as filter strips receives runoff and provides required treatment. The certification letter must be submitted to the San Antonio Regional Office within 2 years of initial certification.

II. All sediment and or media removed from the sedimentation/filtration basins during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

III. All permanent pollution abatement measures shall be operational prior to commencement of commercial operation.

IV. Intentional discharges of sediment laden stormwater during construction are not allowed. If dewatering of excavated areas becomes necessary, the discharge will be filtered through appropriately selected temporary best management practices. These may include vegetative filter strips, sediment traps, rock berms, silt fence rings, etc.

V. The proposed project and associated plan do not address how access to the facility will be achieved once the project is completed. A temporary construction entrance was incorporated into the plan. However this road may only be used for entrance needed during the construction phase of the project. It may not be utilized for post construction access to the facility. Future roads and permanent access to the facility will have to be addressed in a modification or another plan. Additional approval and treatment is required.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.

Prior to Commencement of Construction:

2. Within 60 days of receiving written approval of an Edwards Aquifer protection plan, the applicant must submit to the San Antonio Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TNRCC-0625) that you may use to deed record the approved WPAP is enclosed.

3. All contractors conducting regulated activities at the referenced 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.

4. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.

5. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

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 TCEQ 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. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

<u>During Construction:</u>

8. During the course of regulated activities related to this project, the applicant or 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.

9. If any sensitive feature (caves, solution cavities, sink holes, etc.) 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 potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

10. There are no wells on site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

11. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

12. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

13. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

After Completion of Construction:

14. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the San Antonio Regional Office within 30 days of site completion.

15. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through the San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TNRCC-10263) is enclosed.

16. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

17. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

18. 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.

If you have any questions or require additional information, please contact Amy Burroughs of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210/403-4073.

Sincerely,

for Glenn Shankle
Executive Director
Texas Commission on Environmental Quality

GS/aeb

Enclosures: Deed Recordation Affidavit, TNRCC-0625
Change in Responsibility for Maintenance on Permanent BMPs, TNRCC-10263

fc/cc: Max F. Terry, P.E., John B. Luce Engineering
Mr. Tom Hornseth, Comal County
Mr. Michael Short, City of New Braunfels
Mr. Robert J. Potts, Edwards Aquifer Authority
TCEQ Central Records MC 212

Kathleen Hartnett White, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Larry R. Soward, *Commissioner*
Glenn Shankle, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 18, 2006

Mr. Glendon Eppler
New Braunfels Church of Christ
1665 Business Loop 35 South
New Braunfels TX 78130

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ; Located on the North side of State Hwy 46 at the intersection with State Hwy 1863, West of Loop 337, in the City of New Braunfels
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer, Edwards Aquifer Protection Program ID No. 2377.00, Investigation No: 487096, Regulated Entity No. RN104726906

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PROJECT DESCRIPTION

The proposed project will have an area of 11.306 acres. The proposed development will include 1 building, the church auditorium, totaling 32,725 square feet. Associated parking, driveways and sidewalks represent an addition 128,170 square feet. The impervious cover will be 3.64 acres (32.1 percent). Project wastewater will be disposed of by conveyance to the existing Gruene Sewage Treatment Plant.

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B (SFB)	8.85	5.31	2.69	2.51	11,374	12,605	1,137	2,748	2,253	2,831
C untreated	5.30	3.50	0.05	0.00	0	0	0	0	0	0
Total	16.61	11.27	2.74	3.64					3,267	3,948

Area A: The engineered Vegetative Filter Strips are designed in accordance with the 1999 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices," to treat 1,117 pounds of TSS, generated from the 2.46 acres in the drainage area, of which 1.13 acres are on-site impervious cover. The filtration area will consist of 29,581square feet of vegetation.

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III. All permanent pollution abatement measures shall be operational prior to commencement of commercial operation.

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V. The proposed project and associated plan do not address how access to the facility will be achieved once the project is completed. A temporary construction entrance was incorporated into the plan. However this road may only be used for entrance needed during the construction phase of the project. It may not be utilized for post construction access to the facility. Future roads and permanent access to the facility will have to be addressed in a modification or another plan. Additional approval and treatment is required.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.

Prior to Commencement of Construction:

2. Within 60 days of receiving written approval of an Edwards Aquifer protection plan, the applicant must submit to the San Antonio Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TNRCC-0625) that you may use to deed record the approved WPAP is enclosed.

3. All contractors conducting regulated activities at the referenced 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.

4. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.

5. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

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 TCEQ 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. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

<u>During Construction:</u>

8. During the course of regulated activities related to this project, the applicant or 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.

9. If any sensitive feature (caves, solution cavities, sink holes, etc.) 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 potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

10. There are no wells on site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

11. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

12. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

13. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

<u>After Completion of Construction:</u>

14. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the San Antonio Regional Office within 30 days of site completion.

15. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through the San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TNRCC-10263) is enclosed.

16. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

17. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

18. 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.

If you have any questions or require additional information, please contact Amy Burroughs of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210/403-4073.

Sincerely,

for Glenn Shankle
Executive Director
Texas Commission on Environmental Quality

GS/aeb

Enclosures: Deed Recordation Affidavit, TNRCC-0625
Change in Responsibility for Maintenance on Permanent BMPs, TNRCC-10263

fc/cc: Max F. Terry, P.E., John B. Luce Engineering
Mr. Tom Hornseth, Comal County
Mr. Michael Short, City of New Braunfels
Mr. Robert J. Potts, Edwards Aquifer Authority
TCEQ Central Records MC 212

Kathleen Hartnett White, *Chairman*
R. B. "Ralph" Marquez, *Commissioner*
Larry R. Soward, *Commissioner*
Glenn Shankle, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 18, 2006

Mr. Glendon Eppler
New Braunfels Church of Christ
1665 Business Loop 35 South
New Braunfels TX 78130

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: New Braunfels Church of Christ; Located on the North side of State Hwy 46 at the intersection with State Hwy 1863, West of Loop 337, in the City of New Braunfels
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer, Edwards Aquifer Protection Program ID No. 2377.00, Investigation No: 487096, Regulated Entity No. RN104726906

Dear Mr. Eppler:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the referenced project submitted to the San Antonio Regional Office by John Luce Consulting Engineers, on behalf of New Braunfels Church of Christ on July 25, 2005. Final review of the WPAP submittal was completed after additional material was received on January 25, 2006 and June 8, 2006. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed, and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed project will have an area of 11.306 acres. The proposed development will include 1 building, the church auditorium, totaling 32,725 square feet. Associated parking, driveways and sidewalks represent an addition 128,170 square feet. The impervious cover will be 3.64 acres (32.1 percent). Project wastewater will be disposed of by conveyance to the existing Gruene Sewage Treatment Plant.

PERMANENT POLLUTION ABATEMENT MEASURES

Two systems will be constructed to treat stormwater runoff from the site. The individual treatment measures will consist of a vegetative filter strip (VFS) and a sand filtration basin (SFB) to treat drainage areas A and B. Drainage area C was identified in the plan but will be untreated. Details below:

A. Drainage Area A = the area draining to the vegetative filter strips
B. Drainage Area B = the area draining to the sedimentation filtration basin
C. Drainage Area C = the remainder of the project site and associated drainage. This drainage has no impervious cover on-site.

Drainage Area/ Watershed	Total Area (acres)	On-site Watershed (acres)	Off-site Imp. Cover (acres)	On-site Imp. Cover (acres)	Calc. Min. Capture Volume (ft^3)	Design Capture Volume (ft^3)	Calc. Min. Filter Area (ft^2)	Design Filter Area (ft^2)	Target TSS Load Removal (lb/yr)	Design TSSLoad Removal (lb/yr)
A (VFS)	2.46	2.46	0.00	1.13	7,209	n/a	26,746	29,581	1,014	1,117
B (SFB)	8.85	5.31	2.69	2.51	11,374	12,605	1,137	2,748	2,253	2,831
C untreated	5.30	3.50	0.05	0.00	0	0	0	0	0	0
Total	16.61	11.27	2.74	3.64					3,267	3,948

Area A: The engineered Vegetative Filter Strips are designed in accordance with the 1999 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices," to treat 1,117 pounds of TSS, generated from the 2.46 acres in the drainage area, of which 1.13 acres are on-site impervious cover. The filtration area will consist of 29,581square feet of vegetation.

Area B: The Sand Filter System is designed in accordance with the 1999 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices," to treat 2,831 pounds of TSS, and is sized to capture the first 1.44 inches of stormwater run-off from 8.85 acres. The system will provide a total capture volume of 12,605 cubic feet and a sand filter area of 2,748 square feet.

The approved measures are presented to meet the required 80 percent removal of the increased load in total suspended solids caused by the project.

GEOLOGY

According to the geologic assessment included with the application, there are ten geologic features located on the project site. There were no features assessed as sensitive. The San Antonio Regional Office did not conduct a site investigation.

SPECIAL CONDITIONS

I. The engineered Vegetative Filter Strips are designed in accordance with the 1999 edition of the TCEQ's "Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices." Two years after initial certification, as described in standard condition #14, a Texas Licensed Professional Engineer shall certify in writing that the vegetative filter strips continue to function properly, channelization has not occurred, and that the entire area designated as filter strips receives runoff and provides required treatment. The certification letter must be submitted to the San Antonio Regional Office within 2 years of initial certification.

II. All sediment and or media removed from the sedimentation/filtration basins during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

III. All permanent pollution abatement measures shall be operational prior to commencement of commercial operation.

IV. Intentional discharges of sediment laden stormwater during construction are not allowed. If dewatering of excavated areas becomes necessary, the discharge will be filtered through appropriately selected temporary best management practices. These may include vegetative filter strips, sediment traps, rock berms, silt fence rings, etc.

V. The proposed project and associated plan do not address how access to the facility will be achieved once the project is completed. A temporary construction entrance was incorporated into the plan. However this road may only be used for entrance needed during the construction phase of the project. It may not be utilized for post construction access to the facility. Future roads and permanent access to the facility will have to be addressed in a modification or another plan. Additional approval and treatment is required.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.

Prior to Commencement of Construction:

2. Within 60 days of receiving written approval of an Edwards Aquifer protection plan, the applicant must submit to the San Antonio Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TNRCC-0625) that you may use to deed record the approved WPAP is enclosed.

3. All contractors conducting regulated activities at the referenced 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.

4. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.

5. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the San Antonio Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.

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 TCEQ 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. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

<u>During Construction:</u>

8. During the course of regulated activities related to this project, the applicant or 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.

9. If any sensitive feature (caves, solution cavities, sink holes, etc.) 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 potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.

10. There are no wells on site. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16 TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

11. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

12. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

13. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

<u>After Completion of Construction:</u>

14. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the San Antonio Regional Office within 30 days of site completion.

15. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through the San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TNRCC-10263) is enclosed.

16. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

17. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the San Antonio Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

18. 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.

If you have any questions or require additional information, please contact Amy Burroughs of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210/403-4073.

Sincerely,

for Glenn Shankle
Executive Director
Texas Commission on Environmental Quality

GS/aeb

Enclosures: Deed Recordation Affidavit, TNRCC-0625
Change in Responsibility for Maintenance on Permanent BMPs, TNRCC-10263

fc/cc: Max F. Terry, P.E., John B. Luce Engineering
Mr. Tom Hornseth, Comal County
Mr. Michael Short, City of New Braunfels
Mr. Robert J. Potts, Edwards Aquifer Authority
TCEQ Central Records MC 212

JBL

JOHN B. LUCE
REGISTERED PROFESSIONAL ENGINEER
CIVIL ENGINEERING CONSULTANT

RECEIVED
JUL 07 2006
COUNTY ENGINEER

TCEQ-R13
JUN 30 2006
SAN ANTONIO

April 16, 2006

T.C.E.Q.
San Antonio Regional Office
P.O. BOX 13087
Austin, Texas 7811-3087

Re: Edwards Aquifer, Comal County
NAME OF PROJECT: **NEW BRAUNFELS CHURCH OF CHRIST**
LOCATION: North side of State Highway 46 at its intersection with State Highway 1863, New Braunfels, Texas.
TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer
Edwards Aquifer Protection Program ID No. 2377.00

Dear Ms. Burroughs,

This letter is to address the comments over the above mentioned WPAP that was faxed to our office on the 20th of June, 2006. The following is how the comments were addressed:

COMMENT:
1. Calculate and provide the required TSS removal value for the site. Please indicate the area to be used as a construction entrance. It is our understanding that the proposed "future" driveway/entrance is not included in the calculations. Confirm this is the case or provide a detailed description of the assumptions you have made in preparing the calculations.

RESPONSE:
The future street is not included in this WPAP application as previously state in a comment letter and in a meeting that was held at the TCEQ Regional Office in San Antonio. This street is a combined design effort between TxDOT, City of New Braunfels and the New Braunfels Independent School District and is under the control of another office other than ours. It is the intention of this WPAP application to handle the required TSS removal from the development of the church and the parking lot. It is show on the plans the extent of the parking lot that is included in this application.

(830) 980-7878
jblranch@gvtc.com
P.O. BOX 405
BULVERDE, TEXAS 78163

COMMENT:

2. To prevent pollution of storm water runoff originating on-site and potentially flowing across and off the site after construction, a sedimentation filtration basin and an area of vegetated filter strips designed using the TNRCC technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance of Best Management Practices (June 1999) and proposed. The following Table provides a summary of the data provided in the submittal. Additional data is needed to complete our review and to ensure the proposed measures meet the required 80 percent removal of the increased load in total suspended solids caused by the project. Please confirm the data and complete the table.

A. **Drainage Area A = the area draining to the vegetative filter strip.**
B. **Drainage Area B = the area draining to the sedimentation filtration basin**
C. **Drainage Area C = the remainder of the project site and associated drainage (presently not addressed in the submittal)**
D. **Provide area of contributing drainage and the impervious cover (existing and proposed) within each of the drainage areas.**
E. **Please account for the drainage area on the site that do not contribute run-off to the PBMP's (Drainage Area C). Provide a map clearly showing the limits of the area contributing drainage to individual BMPs as reflected in the updated Table:**

REPONSE

I have included with this letter exhibits showing the impervious cover for both existing and proposed conditions. As shown in the flowing table, each PBMP is either meets or exceeds the required filter sizing as set by TCEQ guidelines that govern this site.

Drainage Area/Watershed	Total Area (acres)	On-site Watershed (acres)	Imp. Cover (Acres)	On-site Imp. Cover (acres)	Runoff Depth (inches)	Calc. Min. Capture Volume (ft^3)	Design Capture Volume (ft^3)	Calc. Min. Filter Area (ft^2)	Design Filter Area (ft^2)	Target TSS Load Removal (lb/yr)	Design TSS Load Removal (lb/yr)
A(VFS)	2.46	2.46	0.00	1.13	1.80	n/a	n/a	29,528	**29,581**	1,117	1,117
B(SFB)	8.85	5.31	2.69	2.51	1.08	10,854	**12,605**	1,573	**2,748**	2,831	2,831
C(Untreated)	5.30	3.50	0.05	0.00	n/a	n/a	n/a	n/a	n/a	0	0
Total	16.61	11.27	2.74	3.64						3,948	3,948

If you have any questions or need more information, please don't hesitate to contact me at 355-0963.

Sincerely,

Max F. Terry, P.E.

Texas Commission on Environmental Quality

TSS Removal Calculations

Project: ***New Braunfels Church of Christ***
Date Prepared: 6/29/2006

1. Required Load Reduction:

$Lm = 27.2(AN \times P)$

where:
Lm = Required TSS removal
An = Net increase in impervious area for site
P = Average annual precipitation, inches

Site Data:		
County =	comal	
Total site area =	2.46	acres
Predevelopment impervious area =	0.00	acres
Post-development impervious area =	1.13	acres
Postdevelopment impervious fraction	0.46	
P =	33	inches
Lm =	1014.288	lbs.

2. Select BMP

Proposed BMP =	vf	abbreviation
Removal efficiency =	85	percent

AC	Aqualogic Cartridge Filter
BR	Bioretention
CW	Constructed Wetland
RI	Retention / Irrigation
SF	Sand Filter
WB	Wet Basin

3. Calculate TSS Load Removed by BMPs

$LR = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:
LR = TSS Load removed by BMP
Ai = Impervious area of BMP catchment
Ap = Pervious area of BMP catchment

Ai =	1.13	acres
Ap =	1.33	acres
Lr =	1116.84	lbs

4. Calculate Fraction of Annual to Treat

F = **0.91**

5. Calculate Capture Volume

Rainfall Depth =	1.80	inches
Post Development Runoff Coefficient =	0.34	
Runoff Volume =	5401	cubic feet
Storage for Sediment=	1080	
Total Capture Volume	6482	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations

Project: ***New Braunfels Church of Christ***
Date Prepared: 6/29/2006

1. Required Load Reduction:

$L_m = 27.2(A_N \times P)$

where:

L_m = Required TSS removal
A_n = Net increase in impervious area for site
P = Average annual precipitation, inches

Site Data:		
County =	**comal**	
Total site area =	**8.82**	acres
Predevelopment impervious area =	**0.18**	acres
Post-development impervious area =	**2.69**	acres
Postdevelopment impervious fraction	**0.30**	
P =	**33**	inches

L_m = **2252.976** lbs.

2. Select BMP

Proposed BMP =	**sf**	abbreviation
Removal efficiency =	**89**	percent

AC	Aqualogic Cartridge Filter
BR	Bioretention
CW	Constructed Wetland
RI	Retention / Irrigation
SF	Sand Filter
WB	Wet Basin

3. Calculate TSS Load Removed by BMPs

$L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

L_R = TSS Load removed by BMP
A_i = Impervious area of BMP catchment
A_p = Pervious area of BMP catchment

A_i =	2.69	acres
A_p =	6.16	acres
L_r =	**2831.28**	lbs

4. Calculate Fraction of Annual to Treat

F = **0.80**

5. Calculate Capture Volume

Rainfall Depth =	**1.08**	inches
Post Development Runoff Coefficient =	**0.26**	
Runoff Volume =	**9045**	cubic feet
Storage for Sediment=	**1809**	
Total Capture Volume	**10854**	cubic feet


2.46 Acres
A
B
C
8.85 Acres
5.30 Ac
0.02Ac
0.06Ac
0.03Ac
0.04Ac
0.03Ac
0.05Ac
Drainage Area "A"
Total Area = 2.46 Ac
Pervious Area = 2.46 Ac
Impervious Area = 0.00 Ac
% Impervious = 0.00%
Drainage Area "B"
Total Area = 8.85 Ac
Pervious Area = 8.67 Ac
Impervious Area = 0.18 Ac
% Impervious = 2.03%
Drainage Area "C"
Total Area = 5.30 Ac
Pervious Area = 5.25 Ac
Impervious Area = 0.05 Ac
% Impervious = 0.94%
EXISTING CONDITIONS
Scale: 1"=200'
RECEIVED
COUNTY ENGINEER



Drainage Area "A"

Total Area	=	2.46 Ac
Pervious Area	=	1.33 Ac
Impervious Area	=	1.13 Ac
Pavement	=	0.62 Ac
Sidewalk	=	0.08 Ac
Building	=	0.43 Ac
% Impervious	=	45.93%

Drainage Area "B"

Total Area	=	8.85 Ac
Pervious Area	=	6.16 Ac
Impervious Area	=	2.69 Ac
Pavement	=	1.90 Ac
Sidewalk	=	0.18 Ac
Building	=	0.42 Ac
Access Ramp	=	0.01 Ac
Offsite	=	0.18 Ac
% Impervious	=	30.40%

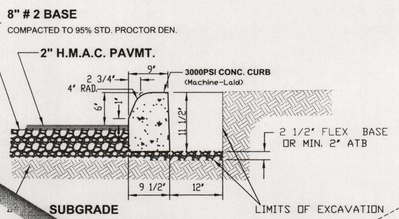
Drainage Area "C"

Total Area	=	5.30 Ac
Pervious Area	=	5.25 Ac
Impervious Area	=	0.05 Ac
% Impervious	=	0.94%

PROPOSED CONDITIONS
Scale: 1"=200'

RECEIVED
COUNTY ENGINEER

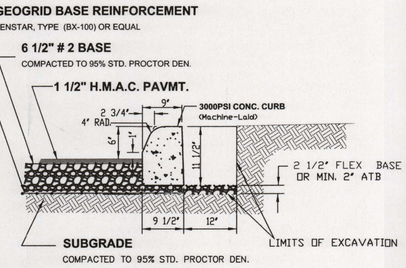
ALTERNATE 2



TYPICAL PAVEMENT SECTION

N.T.S.

ALTERNATE 1



TYPICAL PAVEMENT SECTION

N.T.S.

NOTE:
UNLESS OTHERWISE NOTED, THE TOP OF CURB ELEV. IS 6" ABOVE THE TOP OF PAVEMENT.

LEGEND

42.78C INDICATES TOP OF CURB

43.39P INDICATES TOP OF PAVEMENT

PARKING AREA QUANITIES

EXCLUDING PROPOSED ACCESS ROAD

1. Pavement Area = 11,763 S.Y.
2. Machine Laid Curb = 2,239 L.F.
3. Header Curb = 62 L.F.
4. Retaining Wall = 115 L.F.
5. Sodded Slope = 700 S.Y.

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 INCH = 40 FT.

GENERAL SPECIFICATIONS FOR SITE PREPARATION

General Description

This item shall consist of all clearing and grubbing, demolition, preparation of land to be filled, filling of the land, spreading, compaction testing, and inspection of the fill, and all subsidiary work necessary to complete the grading of the roadway and drainage areas to conform with the lines, grades and slopes as shown on the approved plans.

Clearing the Area to be Filled

All timber, logs, trees, brush and rubbish shall be removed from the site.

Scarifying the Area to be Filled

All organic matter shall be removed from the surface upon which the fill is to be placed, and the surface shall then be disked or scarified to a minimum depth of six inches (6"), all surface ruts or other uneven features will be leveled prior to field density testing.

Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be disked or scarified. Where the slope ratio of the original ground is steeper than 5 horizontal to 1 vertical, the bank shall be stepped or benched. Ground slopes which are flatter than 5 to 1 shall be benched when considered necessary by the Geotechnical Engineer.

Compacting the Area to be Filled

Following the clearing and disking or scarifying of the fill area, it shall be bladed until it is uniform and free from large clods. It shall then be brought to the proper moisture content and compacted to not less than ninety percent (90%) of maximum density in accordance with the current ASTM D 1557 Compaction Procedure, or 90% of maximum density in accordance with the current TxDOT Test Method TEX-113-E Compaction Procedure.

Fill Materials

The materials used shall be free from organic matter and other deleterious substances, such as trees, brush and rubbish.

Density Tests

Field density tests shall be performed on layers of fill when the fill is being placed as directed by the geotechnical engineer. The maximum fill height between density testing shall be eighteen inches (18"). All testing shall be requested by the contractor to the geotechnical engineer sufficiently in advance of fill placement to conduct tests shall be at least the day before. The request or notification shall include the fill area location (Lot and Block), the fill or height of fill and approximate desired time of testing. When these tests indicate that the density of any layer of fill or portion thereof is below the required density, the particular layer or portion shall be reworked and retested at the expense of the contractor unless the contractor can show evidence that circumstances beyond his control required the retesting. Generally, the specific testing will be as follows and conducted by The Geotechnical Engineer.

1. The land to be filled (prepared subgrade) shall be prepared and tested at a frequency as determined by the geotechnical engineer.
2. The first lift of compacted fill (generally 8 to 12-in.) shall be tested as determined by the geotechnical engineer. Any areas supporting the proposed structures requiring fill shall be tested for density compliance.
3. Fills shall be tested a maximum of each eighteen inches (18") of fill.
4. Test results will be provided by the field technician to the contractor when possible; however, all test results are to be reviewed by the geotechnical engineer for compliance. The engineer will notify the contractor of all test results.

Depth and Mixing of Fill Layers

The selected fill material shall be placed in level, uniform layers which, when compacted, shall have a density conforming to that stipulated above. Each layer shall be moisture conditioned, mixed, pulverized, or aerated as necessary to provide in each layer. Compacted layer thickness may vary depending on the compaction equipment of demonstrated capability. The maximum loose depth for any material shall not exceed eight inches (8"). For testing requirements of fill material, see density testing.

Rock

When fill material includes rock, the maximum rock size shall be as approved by the Geotechnical Engineer. No large rocks shall be allowed to nest and all voids must be filled with small stones or soil and adequately compacted. No large rocks will be permitted within eighteen inches (18") of the finished grade.

Moisture Content

The fill material shall be compacted at the appropriate moisture content specified for the soils being used. Appropriate moisture content is defined, typically, as optimum moisture content; however, for expansive soils it may be greater than optimum moisture content, and other moisture contents may be necessary to produce the desired results with certain soils.

DENSITY TEST FREQUENCY

Amount of Compaction

Following placing and spreading, the fill shall be compacted to the appropriate specified density which is acceptable to the Geotechnical Engineer. The specified density typically will be ninety percent (90%) of ASTM D 1557 Compaction Procedure or 90% of the maximum dry density by TxDOT Test Method TEX-113-E.

Compaction of Fill Layer

Compaction equipment shall be capable of compacting the fill to the specified density. Compaction shall be accomplished while the fill material is at or near the appropriate moisture content. Compaction of each layer shall be continuous over the entire structural area (beneath proposed structures).

Compaction of Slopes

The faces of fill slopes shall be compacted. Compacting operations shall be continued until the slope faces are stable but not too dense for planting on the slopes. Compaction of the slope faces may be done progressively in increments of three to five feet (3' to 5') in fill height as the fill progresses or after the fill has been brought to its total height.

Drainage Area "A"

Total Area	= 2.46 Ac
Pervious Area	= 1.33 Ac
Impervious Area	= 1.13 Ac
Pavement	= 0.62 Ac
Sidewalk	= 0.08 Ac
Building	= 0.43 Ac
% Impervious	= 45.93%

Drainage Area "B"

Total Area	= 6.85 Ac
Pervious Area	= 6.16 Ac
Impervious Area	= 2.69 Ac
Pavement	= 1.90 Ac
Sidewalk	= 0.18 Ac
Building	= 0.42 Ac
Access Ramp	= 0.01 Ac
Offsite	= 0.18 Ac
% Impervious	= 30.40%

Drainage Area "C"

Total Area	= 5.30 Ac
Pervious Area	= 5.25 Ac
Impervious Area	= 0.05 Ac
% Impervious	= 0.94%

TCEQ-R13
JUN 30 2006
SAN ANTONIO

RECEIVED
JUL 07 2006
COUNTY ENGINEER

NEW BRAUNFELS CHURCH OF CHRIST
HWY 46 & HWY 1863
NEW BRAUNFELS, TEXAS

Grading Plan

JOHN LUCE
CIVIL ENGINEERING CONSULTANT
P.O. BOX 405
BULVERDE, TEXAS 78163
(830) 980-7878

STATE OF TEXAS · MAX F. TERRY · 86404 · LICENSED PROFESSIONAL ENGINEER

REVISIONS:	
DATE	BY
12/03/05	J.B.L.
05/16/06	J.B.L.

JOB NO. E - 10852405
CLIENT: TIMBERCON CONSTRUCTION
DATE: 11/23/05
DESIGN: M.F.T.
DRAWN: M.F.T.
CHECKED: J.B.L.
SHEET C 3

JBL

JOHN B. LUCE
REGISTERED PROFESSIONAL ENGINEER
CIVIL ENGINEERING CONSULTANT

RECEIVED
JUN 12 2006
COUNTY ENGINEER

NEW BRAUNFELS CHURCH OF CHRIST

HWY. 46 at F.M. 1963
New Braunfels, Texas

TCEQ-R13
JUN 08 2006
SAN ANTONIO

WPAP

30 TAC §213.5(b)



Job No. E-10852405

January 25, 2006
Rev: 06/08/06

(830) 980-7878
jblranch@gvtc.com

P.O. BOX 405
BULVERDE, TEXAS 78163

GENERAL INFORMATION FORM

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

REGULATED ENTITY NAME: **New Braunfels Church of Christ**
COUNTY: **Comal** STREAM BASIN: **Blieders Creek**

EDWARDS AQUIFER: ✓ RECHARGE ZONE
__ TRANSITION ZONE

PLAN TYPE: ✓ WPAP __ AST __ EXCEPTION
__ SCS __ UST __ MODIFICATION

CUSTOMER INFORMATION

1. Customer (Applicant):

Contact Person: **Glendon Eppler**
Entity: **New Braunfels Church of Christ**
Mailing Address: **1665 Bus. Loop 35 So.**
City, State: **New Braunfels, Texas** Zip: **78130**
Telephone: **(830) 625-3520** FAX:

Agent/Representative (If any):

Contact Person: **Max F. Terry, P.E.**
Entity: **John Luce Consulting Engineers**
Mailing Address: **P.O. Box 405**
City, State: **Bulverde, Texas** Zip: **78163**
Telephone: **(830) 980-7842** FAX:

2. ✓ This project is inside the city limits of **New Braunfels**.
__ This project is outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____.
__ This project is not located within any city's limits or ETJ.

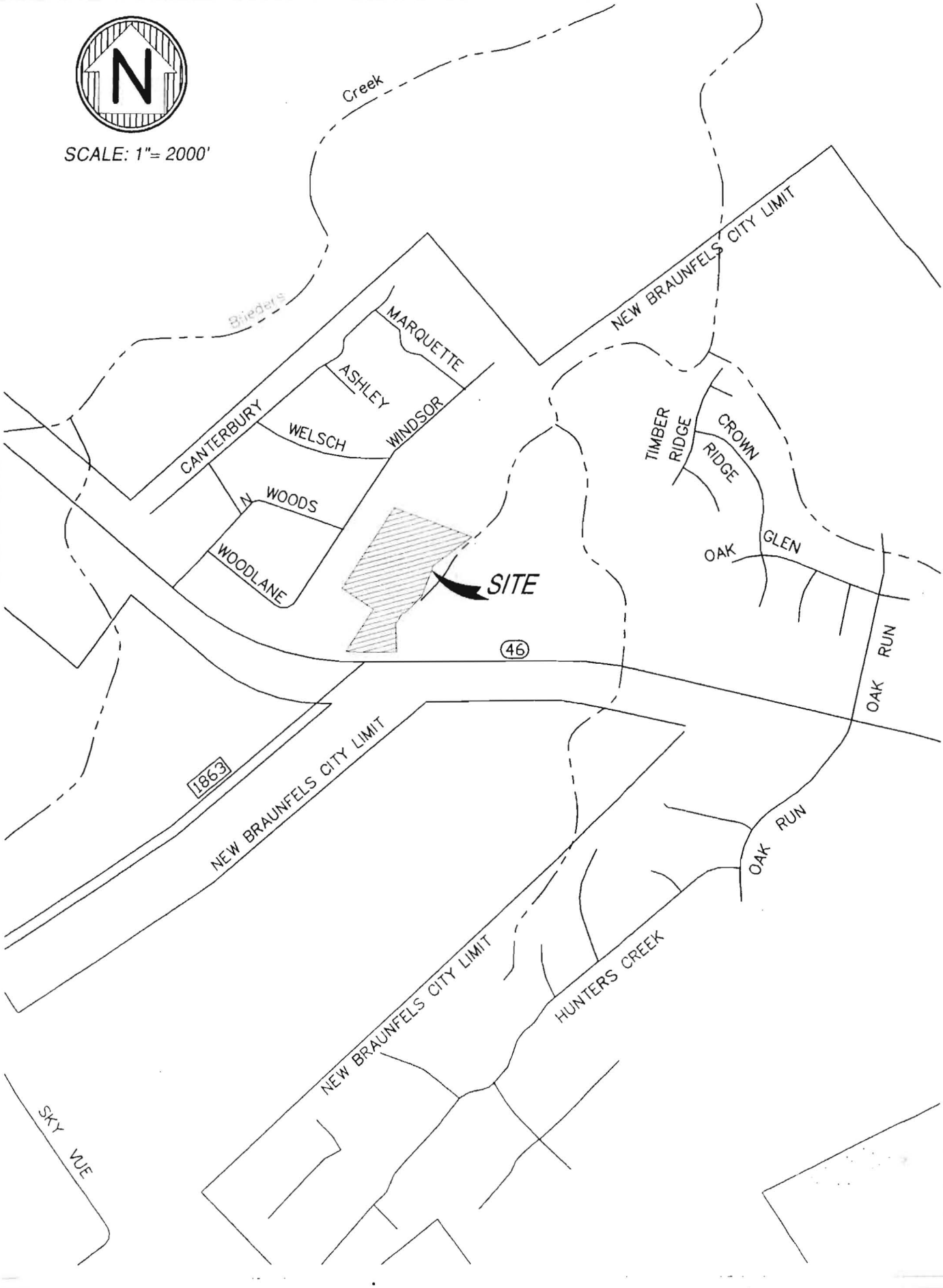
3. The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.
On the northside of State Hwy 46 at its intersection with State Hwy 1863, west of Loop 337, in the City of New Braunfels

4. ✓ **ATTACHMENT A - ROAD MAP**. A road map showing directions to and the location of the project site is attached at the end of this form.

5. ✓ **ATTACHMENT B - USGS / EDWARDS RECHARGE ZONE MAP**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards

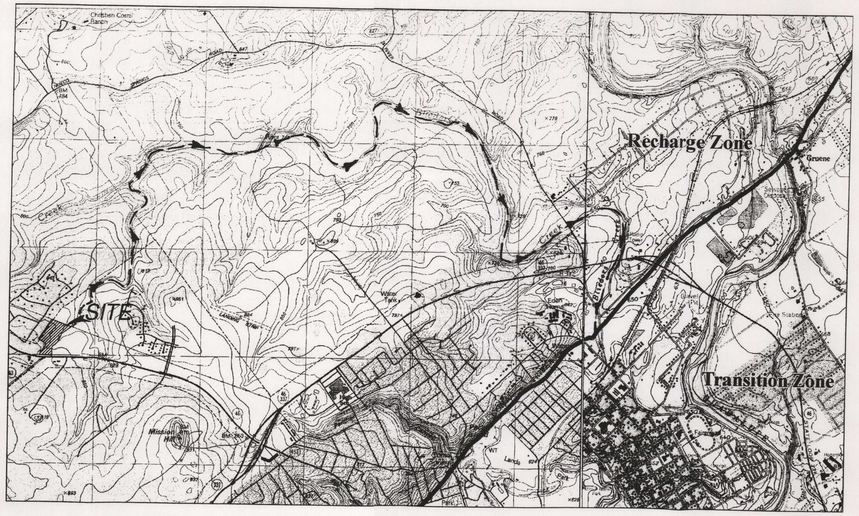
ATTACHMENT A

ROAD MAP


N
SCALE: 1"= 2000'
Creek
Bjieders
MARQUETTE
ASHLEY
WINDSOR
WELSCH
CANTERBURY
N WOODS
WOODLANE
NEW BRAUNFELS CITY LIMIT
TIMBER RIDGE
CROWN RIDGE
OAK GLEN
SITE
46
OAK RUN
1863
NEW BRAUNFELS CITY LIMIT
OAK RUN
NEW BRAUNFELS CITY LIMIT
HUNTERS CREEK
SKY VUE

ATTACHMENT B

USGS/EDWARDS RECHARGE ZONE MAP


Recharge Zone
Transition Zone
SITE
Groene

✓ Project-site.
✓ USGS Quadrangle Name(s).
✓ Boundaries of the Recharge Zone (and Transition Zone, if applicable).
✓ Drainage path from the project to the boundary of the Recharge Zone.

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

7. ✓ **ATTACHMENT C - PROJECT DESCRIPTION**. Attached at the end of this form is a detailed narrative description of the proposed project.

8. Existing project site conditions are noted below:
— Existing commercial site
— Existing industrial site
— Existing residential site
— Existing paved and/or unpaved roads
— Undeveloped (Cleared)
✓ Undeveloped (Undisturbed/Uncleared)
— Other:

PROHIBITED ACTIVITIES

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

(1) waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
(2) new feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
(3) land disposal of Class I wastes, as defined in 30 TAC §335.1;
(4) the use of sewage holding tanks as parts of organized collection systems; and
(5) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

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

(1) waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);
(2) land disposal of Class I wastes, as defined in 30 TAC §335.1; and
(3) new municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

ADMINISTRATIVE INFORMATION

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

✓ For a Water Pollution Abatement Plan and Modifications, the total acreage of the site where regulated activities will occur.

NARRATIVE PROJECT DESCRIPTION

The proposed 11.3 acres site is the future home of the New Braunfels Church of Christ. The project is located in southeast Comal County, within the city limits of New Braunfels, along the north right-of-way line of Hwy 46 at Hwy 1863. The construction will consist of the church, parking area and an access road to Hwy 46.

The proposed overall impervious cover for New Braunfels Church of Christ is approximately 33.3%, including: streets, sidewalks, driveways and rooftops. As per the requirements of the City of New Braunfels, a detention basin will be utilized to collect the runoff from the development and release it at the existing undeveloped rate.

The 11.3 acres generally slopes to the south to a tributary of Blieders Creek.

ATTACHMENT C

___ For a Water Pollution Abatement Plan and Modifications, the total acreage of the site where regulated activities will occur.

___ For an Organized Sewage Collection System Plans and Modifications, the total linear footage of all collection system lines.

___ For a UST Facility Plan or an AST Facility Plan, the total number of tanks or piping systems.

___ A Contributing Zone Plan.

___ A request for an exception to any substantive portion of the regulations related to the protection of water quality.

___ A request for an extension to a previously approved plan.

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

___ TCEQ cashier

___ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)

✓ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

13. ✓ Submit one (1) original and three (3) copies of the completed application to the appropriate regional office for distribution by the TCEQ to the local municipality or county, groundwater conservation districts, and the TCEQ's Central Office.

14. ✓ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the executive director.

___ No person shall commence any regulated activity until the Contributing Zone Plan for the activity has been filed with the executive director.

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

Max F. Terry, P.E.
Print Name of Customer/Agent

Max F. Terry
Signature of Customer/Agent

01/24/06
Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

GEOLOGIC SITE ASSESSMENT

Geologic Site Assessment (WPAP)

for Regulated Activities / Development
on the Edwards Aquifer Recharge / Transition Zone

The New Braunfels Church of Christ
11.3 Acres
New Braunfels, Texas

Frost GeoSciences Control # FGS-05206

June 20, 2005

Prepared exclusively for

John Luce Consulting Engineers
P.O. Box 405
Bulverde, TX 78163

Frost GeoSciences

Geologic and Environmental Consulting

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Geologic and Environmental Consulting

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Fax (830) 229-5601 metro
www.frostgeosciences.com

Steve Frost, C.P.G.

June 20, 2005

John Luce Consulting Engineers
P.O. Box 405
Bulverde, TX 78163

Attn: Mr. Richard Ramirez

Re: Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
11.3 Acres
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-05206

Gentlemen:

Attached is a copy of the Geologic Assessment Report completed for the above referenced project site as it relates to 30 TAC §213.5(b)(3), effective June 1, 1999. Our investigation was conducted, and this report was prepared in general accordance with the "Instructions to Geologists", TNRCC-0585-Instructions (Rev. 5-1-02). The results of our investigation along with any required recommendations for Best Management Practices (BMP's) are provided in the following report.

If you have any questions regarding this report, or if Frost GeoSciences, Inc. may be of additional assistance to you on this project, please feel free to call our office. It has been a pleasure to work with you and we wish to thank you for the opportunity to be of service to you on this project. We look forward to being of continued service.

STATE OF TEXAS
Steve M. Frost
Geology
License No. 315
LICENSED PROFESSIONAL GEOSCIENTIST

Sincerely,
Frost GeoSciences, Inc.

Steve Frost, C.P.G.
President, Senior Geologist

Distribution: (6) John Luce Consulting Engineers

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APPENDIX

A: Plate 1: Site Plan
Plate 2: Street Map
Plate 3: U.S.G.S. Topographic Map
Plate 4: Official Edwards Aquifer Recharge Zone Map
Plate 5: FEMA Flood Map
Plate 6: U.S. Geological Survey, Water Resources Investigation # 94-4117
Plate 7: 2003 Aerial Photograph, 1"=500'
Plate 8: 2003 Aerial Photograph with PRF's, 1"=200'
Plate 9: 1973 Photograph, 1"=500'

B: Site Photographs

C: Site Geologic Map

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

REGULATED ENTITY NAME: The New Braunfels Church of Christ - 11.3 Acres

TYPE OF PROJECT: ✓ WPAP __ AST __ SCS __ UST

LOCATION OF PROJECT: ✓ Recharge Zone __ Transition Zone __ Contributing Zone within the Transition Zone

PROJECT INFORMATION

1. ✓ Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE.**

2. Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (*Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A*, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
Rumple-Comfort Assoc.	C/D	0.5 to 2

* Soil Group Definitions (Abbreviated)

A. Soils having a high infiltration rate when thoroughly wetted.

B. Soils having a moderate infiltration rate when thoroughly wetted.

C. Soils having a slow infiltration rate when thoroughly wetted.

D. Soils having a very slow infiltration rate when thoroughly wetted.

3. ✓ A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column.

4. ✓ A **NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY** is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site.

5. ✓ Appropriate **SITE GEOLOGIC MAP(S)** are attached:

The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1" : 400'

Applicant's Site Plan Scale	1" = 50 '
Site Geologic Map Scale	1" = 50 '
Site Soils Map Scale (if more than 1 soil type)	1" = 500 '

6. ✓ Method of collecting positional data:
Global Positioning System (GPS) technology.

✓ Other method(s). 2003 Aerial Photograph

7. ✓ The project site is shown and labeled on the Site Geologic Map.

8. ✓ Surface geologic units are shown and labeled on the Site Geologic Map.

9. ✓ 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.

10. ✓ The Recharge Zone boundary is shown and labeled, if appropriate.

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

__ There are ____(#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
__ The wells are not in use and have been properly abandoned.
__ The wells are not in use and will be properly abandoned.
__ The wells are in use and comply with 16 TAC §76.
✓ There are no wells or test holes of any kind known to exist on the project site.

ADMINISTRATIVE INFORMATION

12. ✓ Five (5) originals of the completed assessment have been provided.

Date(s) Geologic Assessment was performed: June 17, 2005
Date(s)

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

Steve Frost, C.P.G.
Print Name of Geologist

(830) 229-5603 metro
Telephone

(830) 229-5601 metro
Fax

Steve Frost
Signature of Geologist

June 20, 2005
Date

Representing: Frost GeoSciences, Inc.
(Name of Company)

If you have questions on how to fill out this form or about the Edwards Aquifer Protection Program, please contact us at 512/939-2929 (Austin) or 210/403-4024 (San Antonio)

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282

Stratigraphic Column

[Hydrogeologic subdivisions modified from Maclay and Small (1976); groups, formations, and members modified from Rose (1972); lithology modified from Dunham (1962); and porosity type modified from Choquette and Pray (1970). CU, confining unit; AQ, aquifer]

Hydrogeologic subdivision			Group, formation, or member			Hydrologic function	Thickness (feet)	Lithology	Field identification	Cavern development	Porosity/ permeability type
Upper Cretaceous	Upper confining units		Eagle Ford Group			CU	30 – 50	Brown, flaggy shale and argillaceous limestone	Thin flagstones; petroliferous	None	Primary porosity lost/ low permeability
			Buda Limestone			CU	40 – 50	Buff, light gray, dense mudstone	Porcelaneous limestone with calcite-filled veins	Minor surface karst	Low porosity/low permeability
			Del Rio Clay			CU	40 – 50	Blue-green to yellow-brown clay	Fossiliferous; *Ilymatogyra arietina*	None	None/primary upper confining unit
Lower Cretaceous	I	Edwards aquifer	Georgetown Formation			Karst AQ; not karst CU	2 – 20	Reddish-brown, gray to light tan marly limestone	Marker fossil; *Waconella wacoensis*	None	Low porosity/low permeability
	II		Edwards Group	Person Formation	Cyclic and marine members, undivided	AQ	80 - 90	Mudstone to packstone; *miliolid* grainstone; chert	Thin graded cycles; massive beds to relatively thin beds; crossbeds	Many subsurface; might be associated with earlier karst development	Laterally extensive; both fabric and not fabric/water-yielding
	III				Leached and collapsed members, undivided	AQ	70 – 90	Crystalline limestone; mudstone to grainstone; chert; collapsed breccia	Bioturbated iron-stained beds separated by massive limestone beds; stromatolitic limestone	Extensive lateral development; large rooms	Majority not fabric/one of the most permeable
	IV				Regional dense member	CU	20 – 24	Dense, argillaceous mudstone	Wispy iron-oxide stains	Very few; only vertical fracture enlargement	Not fabric/low permeability; vertical barrier
	V			Kainer Formation	Grainstone member	AQ	50 – 60	*Miliolid* grainstone; mudstone to wackestone; chert	White crossbedded grainstone	Few	Not fabric/ recrystallization reduces permeability
	VI				Kirschberg evaporite member	AQ	50 – 60	Highly altered crystalline limestone; chalky mudstone; chert	Boxwork voids, with neospar and travertine frame	Probably extensive cave development	Majority fabric/one of the most permeable
	VII				Dolomitic member	AQ	110 – 130	Mudstone to grainstone; crystalline limestone; chert	Massively bedded light gray, *Toucasia* abundant	Caves related to structure or bedding planes	Mostly not fabric; some bedding plane-fabric/water-yielding
	VIII				Basal nodular member	Karst AQ; not karst CU	50 – 60	Shaly, nodular limestone; mudstone and *miliolid* grainstone	Massive, nodular and mottled, *Exogyra texana*	Large lateral caves at surface; a few caves near Cibolo Creek	Fabric; stratigraphically controlled/large conduit flow at surface; no permeability in subsurface
	Lower confining unit		Upper member of the Glen Rose Limestone			CU; evaporite beds AQ	350 – 500	Yellowish tan, thinly bedded limestone and marl	Stair-step topography; alternating limestone and marl	Some surface cave development	Some water production at evaporite beds/relatively impermeable

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: The New Braunfels Church of Christ - 11.3 Acres FGS-05206

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B*	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT²)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						< 40	> 40	< 1.6	> 1.6	
S-1	N29°43'16.0"	W98°10'40.5"	SC	20	Kcp	1	1	1.5	-	-	-	-	O/F	13	33	33			Yes	Drainage
S-2	N29°43'18.4"	W98°10'39.5"	MB	30	Kcp	3	3	?	-	-	-	-	X	9	39	39			Yes	Drainage
S-3	N29°43'19.2"	W98°10'37.2"	MB	30	Kcp	3	3	?	-	-	-	-	X	9	39	39			Yes	Drainage
S-4	N29°43'21.6"	W98°10'38.0"	CD	5	Kcp	40	50	3	-	-	-	-	N/C/O	13	18	18		Yes		Hillside
S-5	N29°43'23.2"	W98°10'37.7"	SC	20	Kcp	1	1	1.5	-	-	-	-	O/F	13	33	33		Yes		Hillside
S-6	N29°43'25.2"	W98°10'37.4"	CD	5	Kcp	8	12	2	-	-	-	-	N/C/O	13	18	18		Yes		Hillside
S-7	N29°43'25.6"	W98°10'34.9"	CD	5	Kcp	10	12	1.5	-	-	-	-	N/C/O	13	18	18		Yes		Hillside
S-8	N29°43'23.2"	W98°10'33.7"	MB	30	Kcp	3	3	?	-	-	-	-	X	9	39	39			Yes	Drainage
S-9	N29°43'21.7"	W98°10'34.5"	MB	30	Kcp	3	3	?	-	-	-	-	X	9	39	39			Yes	Drainage
S-10	N29°43'20.5"	W98°10'35.2"	MB	30	Kcp	3	3	?	-	-	-	-	X	9	39	39			Yes	Drainage

* DATUM 1927 North American Datum (NAD27)

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution Cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow Hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have 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. My signature certifies that I am qualified as a geologist as defined by 30 TAC 213.

Signature Steve Frost Date June 20, 2005 Sheet 1 of 1

LOCATION

The project site is located along and north of State Highway 46 at the intersection of F.M. 1863 in New Braunfels, Texas. An overall view of the area is shown on copies of the site plan, a street map, the U.S.G.S. Topographic Map, the Edwards Underground Water District Reference Map, the FIRM Map, a geologic map, a 2003 Aerial Photograph at a scale of 1"=500', a 2003 Aerial Photograph at a scale of 1"=200', and a 1973 Photograph at a scale of 1"=500', Plates 1, 2, 3, 4, 5, 6, 7, 8, and 9 in Appendix A.

METHODOLOGY

The Geologic Assessment was conducted by Mr. Steve Frost, C.P.G., President and Senior Geologist with Frost GeoSciences, Inc. Mr. Frost is a Licensed Professional Geoscientist in the State of Texas (License # 315), and is a Certified Professional Geologist with the American Institute of Professional Geologist (Certification # 10176).

Frost GeoSciences, Inc. researched the geology of the area near the intersection of F.M. 1863 and State Highway 46. The research included, but was not limited to, the Bureau of Economic Geology, Geologic Atlas of Texas, San Antonio Sheet, FEMA maps, Edwards Aquifer Recharge Zone Maps, U.S.G.S. 7.5 Minute Quadrangle Maps, the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, the U.S.G.S. Water-Resources Investigations Report 94-4117, and the U.S.D.A. Soil Survey of Comal & Hays Counties, Texas.

After reviewing the available information, a field investigation was performed to identify any geologic or man made potential recharge features. A transect spacing of approximately 50 feet, or less depending on vegetation thickness, was used to inspect the project area. A 2003 aerial photograph, in conjunction with a hand held Garmin eTrex Summit Global Positioning System with an Estimated Potential Error ranging from 12 to 15 feet, was used to navigate around the property and identify the locations of potential recharge features, as recommended in the "Instructions to Geologists", TNRCC-0585-Instructions (Rev. 5-1-02). The locations of any potential recharge features noted in the field were marked with blue and white flagging. The flagging

is numbered with the same potential recharge feature I.D. # that is used on the Site Geologic Map in Appendix C of this report. The Site Geologic Map indicating the limits of the project site and the locations of potential recharge features is included in Appendix C. A copy of a 2003 Aerial Photograph at an approximate scale of 1"=200' indicating the limits of the project site and the locations of potential recharge features is included on Plate 8 in Appendix A. The Geologic Assessment Form, Stratigraphic Column, and the Geologic Assessment Table have been filled with the appropriate information for this project site and are included on pages 1-4 of this report.

RESEARCH & OBSERVATIONS

7.5 Minute Quadrangle Map Review

According to the U.S.G.S. 7.5 Minute Quadrangle Map, New Braunfels West, Texas Sheet (1988), the elevation across the project site ranges from 840 near the northeastern property corner to 860 feet along State Highway 46. The project site has a total relief of approximately 20 feet. Runoff from the project site flows to the north into an unnamed tributary of Blieders Canyon. State Highway 46 is located immediately south of the project site. F.M. 1863 is located south of the project site across State Highway 46. Areas of residential development are located north, south, and west of the project site. Mission Hill is located southeast of the project site. A copy of the U.S.G.S. 7.5 Minute Quadrangle Map indicating the location of the project site is included on Plate 3 in Appendix A.

Recharge / Transition Zone

According to the Official Edwards Aquifer Recharge Zone Map, New Braunfels West, Texas Sheet (1988), the project site is located within the Recharge Zone of the Edwards Aquifer. A copy of the Official Edwards Aquifer Recharge Zone Map indicating the location of the project site is included on Plate 4 in Appendix A.

100-Year Floodplain

According to the Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) Panel # 4854630100C, revised 09-29-86, the project site is located within Zone C. According to the Panel Legend, Zone C represents areas of minimal flooding. A copy of the above referenced FIRM panel indicating the location of the project site is included on Plate 5 in Appendix A.

Soils

According to the United States Department of Agriculture, Soil Conservation Service, Soil Survey of Comal & Hays Counties, Texas, (1984), the project site is located on the Rumple-Comfort Association (RUD). A copy of the 1973 aerial photograph (approximate scale: 1"=500') from the U.S.D.A. Soil Survey of Comal & Hays Counties, Texas indicating the location of the project site and the soil types is included on Plate 9 in Appendix A.

The Rumple-Comfort Association consists of shallow and moderately deep soils on uplands in the Edwards Plateau Land Resource Area. The surface layer of the Rumple Soil is dark reddish brown very cherty clay loam about 10 inches thick. Rounded chert and limestone cobbles and gravel cover about 20 percent of the surface. The subsoil to a depth of 14 inches is dark reddish-brown very cherty clay, and to a depth of 28 inches it is dark reddish-brown extremely stony clay. The underlying material is indurated fractured limestone. The Comfort Soil is dark brown, neutral, extremely stony clay about 7 inches thick. The subsoil to a depth of 12 inches is dark reddish-brown, mildly alkaline, extremely stony clay. The underlying material is indurated fractured limestone. The soil is noncalcareous throughout.. The soils in this association are well drained. Surface runoff is medium, but varies due to the occurrence of caves, fracture zones, and sinks. Permeability is moderately slow. Water erosion is a moderate hazard. This soil has a USDA Texture Classification of very cherty clay loam, stony clay, very stony clay, extremely stony clay, and weathered bedrock. The Unified Classification is GC, CL, or SC. The AASHO Classification is A-2-6, A-6, and A-2-7. This soil has an average permeability from 0.2 to 0.6 inches/hour. ..

Narrative Description of the Site Geology

Based on a visual inspection of the ground surface, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to be low.

Two natural karst features, three non-karst closed depressions, and five man-made features were noted on the project site at the time of the field investigation on June 17, 2005. The locations of the Potential Recharge Features are identified on the Site Plan on Plate 1 in Appendix A, on the 2003 aerial photograph on Plate 8 in Appendix A, and on the Site Geologic Map provided in Appendix C. Color photographs of the project site and some of the potential recharge features are included in Appendix B.

Potential Recharge Features S-1 and S-5 consist of solution cavities of various sizes. These were filled in with loose leaves and limestone rubble. A machete was used to probe the depths of these features. Frost GeoSciences, Inc. rates these features as low on Figure 1 of the TNRCC-0585-Instructions (Rev. 5-01-02). These features score a 33 on the sensitivity scale in column 10 of the Geologic Assessment Table on Page 4 of this report.

Potential Recharge Features S-2, S-3, S-8, S-9, & S-10 are man-made feature in bedrock consisting of existing sanitary sewer manhole covers. Frost GeoSciences, Inc. rates these features as low on Figure 1 of the TNRCC-0585-Instructions (Rev. 5-01-02). These features score a 39 on the sensitivity scale in column 10 of the Geologic Assessment Table on Page 4 of this report.

Potential Recharge Features S-4, S-6, and S-7 are low lying depressed areas that appear to have been created by an old episode of bulldozing on the property. It is strongly suspected that these low lying areas are the result of removing trees, and/or boulders. Numerous small outcrops of weathered gray limestone with tan chips from bulldozer scabs were noted across the central, western and northern portions of the project site. Several areas of bulldozed topsoil mixed with brush were also noted on the property. Frost GeoSciences, Inc. rates these features as low on Figure 1 of the TNRCC-0585-Instructions (Rev. 5-01-02). These features score a 18 on the sensitivity scale in column 10 of the Geologic Assessment Table on Page 4 of this report.

The property exists as undeveloped land. The project site supports a moderate to dense stand of vegetative cover with a moderate to dense stand of grasses. Overall vegetation on the project site consists of ashe juniper (*Juniperus ashei*), Cedar Elm (Ulmus crassifolia), Mesquite (Prosopis l.), hackberry (Celtis sp.), China Berry (*Melia azadarach L.*), and live oak (*Quercus virginiana*), with Texas persimmon (*Diospyros texana*), Sotol (*Dasylirion Zucc.*), agarita (*Berberis trifoliolata*), and huisache (Acacia farnesiana),

According to the site plan provided by the John Luce Consulting Engineers, the surveyed elevations on the project site range from 826 feet near the northeastern property corner to 856 feet near the southwestern corner of the project site. A copy of the site plan indicating the boundary of the project site and the elevations is included on the Site Plan on Plate 1 in Appendix A and the Site Geologic Map in Appendix C of this report.

The project site was covered by a notably thick soil layer with well developed native grass cover. Small scattered limestone outcrops with bulldozer scars were noted in the central, western, and northern portions of the project site.

According to the U.S. Geological Survey Water Resources Investigations 94-4117, the project site is located on the Cyclic and Marine Member and the Leached and Collapsed Member of the Cretaceous Edwards Person Limestone.

The Cyclic and Marine Member of the Edwards Person Limestone consists of mudstone to packstone with milliolid grainstone and chert. This member occurs as thin graded cycles of massive to relatively thin beds with some crossbeds. Typically, cavern development in this member is common, but occurs mainly in the subsurface. The caverns within this member might be associated with earlier episodes of karst development.

The Leached and Collapsed Member of the Edwards Person Limestone consists of crystalline limestone, mudstone to grainstone with chert, and collapsed breccia. This member is stromatolitic limestone. The Leached and Collapsed Member is characterized by bioturbated iron stained beds separated by massive limestone beds. This member is typically one of the most permeable and has extensive lateral development with large rooms. Overall thickness ranges from 70 to 90 feet thick.

A copy of the U.S.G.S. Water Resources Investigation 94-4117 indicating the location of the project site is included on Plate 6 in Appendix A.

BEST MANAGEMENT PRACTICE (BMP)

Based on a visual inspection of the ground surface and the research performed for this project, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to be low. However, the potential always exists to encounter subsurface features that lack a surface expression. Construction personnel should be informed of the potential to encounter subsurface karst features during excavating activities. Construction personnel should also be informed of the proper protocol to follow in the event that a solution cavity and/or cave is encountered during the excavation and development of the property.

DISCLAIMER

This report has been prepared in general accordance with the "Instructions to Geologists", TNRCC-0585-Instructions (Rev. 5-1-02) by a Licensed Texas Professional Geoscientist. All areas of the project site were carefully inspected for features that could contribute to the recharge of the Edwards Aquifer, however, this survey cannot preclude the presence of subsurface karst features that lack surface expression. This report is not intended to be a definitive investigation of all possible geologic or karst features at this site. All conclusions, opinions, and recommendations for Best Management Practices (BMP's) in this report are based on information obtained while researching the project, and on the site conditions at the time of our field investigation.

This report has been prepared for the exclusive use of the New Braunfels Church of Christ and John Luce Consulting Engineers. This report is based on available known records, a visual inspection of the project site, and the work generally accepted for a Geologic Assessment for Regulated Activities Developments on the Edwards Aquifer Recharge / Transition Zone, relating to 30 TAC §213.5(b)(3), effective June 1, 1999.

REFERENCES

1) U.S.G.S. 7.5 Minute Quadrangle Map, New Braunfels West, Texas Sheet (1988).

2) Official Edwards Aquifer Recharge Zone Map, New Braunfels West, Texas Sheet (1996).

3) Small, Ted A., and Hanson, John A., 1994, Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Comal County, Texas. U.S. Geological Survey Water Resources Investigations 94-4117.

4) Barnes, V.L., 1983, Geologic Atlas of Texas, San Antonio Sheet, Bureau of Economic Geology, The University of Texas at Austin, Texas.

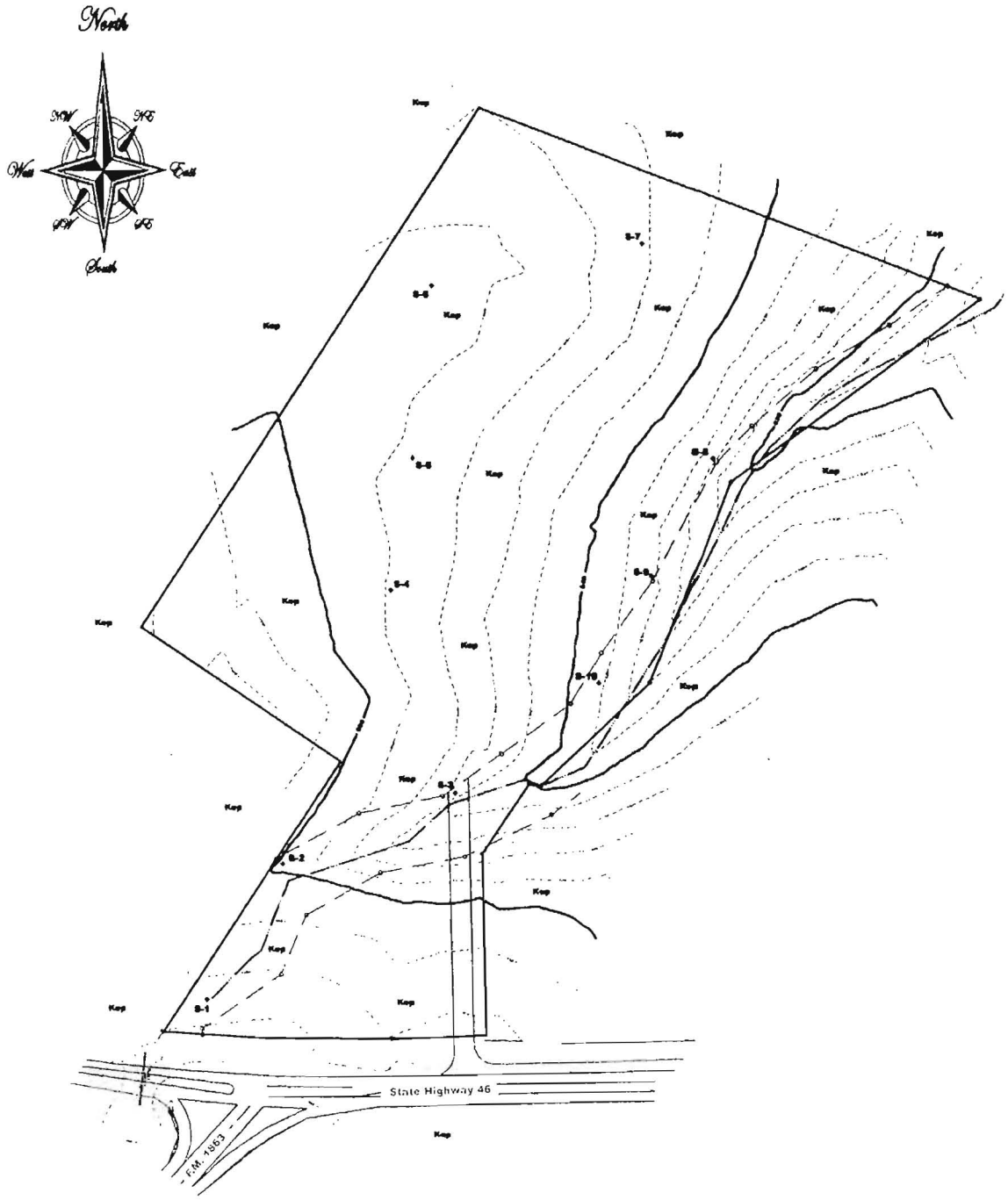
5) Federal Emergency Management Agency (FEMA), September 29, 1986, Comal County, Texas and Incorporated Areas, Flood Insurance Rate Map (FIRM), Panel #4854630100C FEMA, Washington D.C.

6) U.S.D.A. Soil Conservation Service, Soil Survey of Comal & Hays Counties, Texas (1984).

7) TNRCC-0585-Instructions (Rev. 5-1-02). "Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone".

8) Collins, Edward, W., 2000, Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, Bureau of Economic Geology, The University of Texas at Austin, Texas.

Appendix A



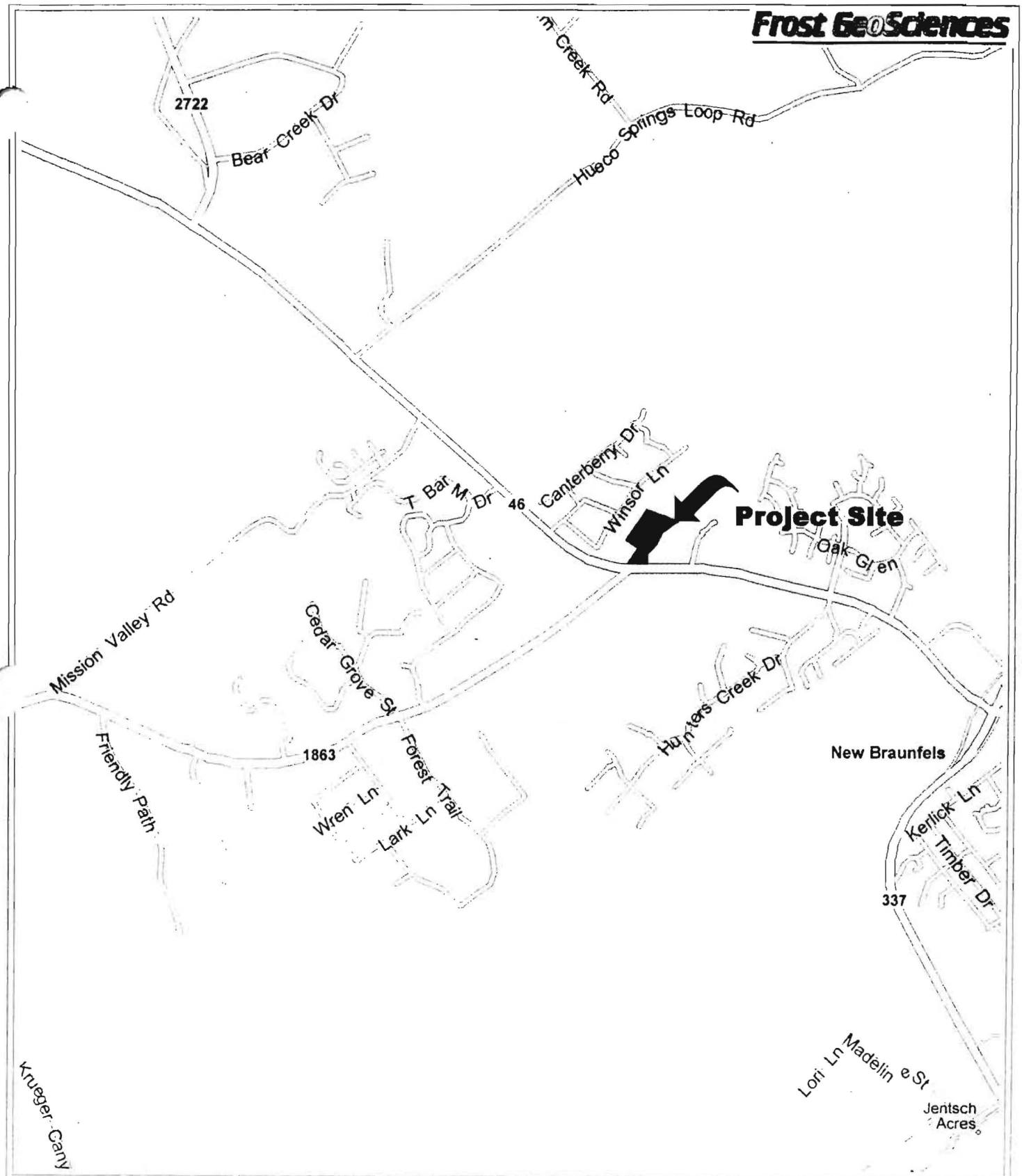
1 inch = 200 feet

PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

Site Plan

PROJECT NO.: FGS-05206

DATE: June 20, 2005

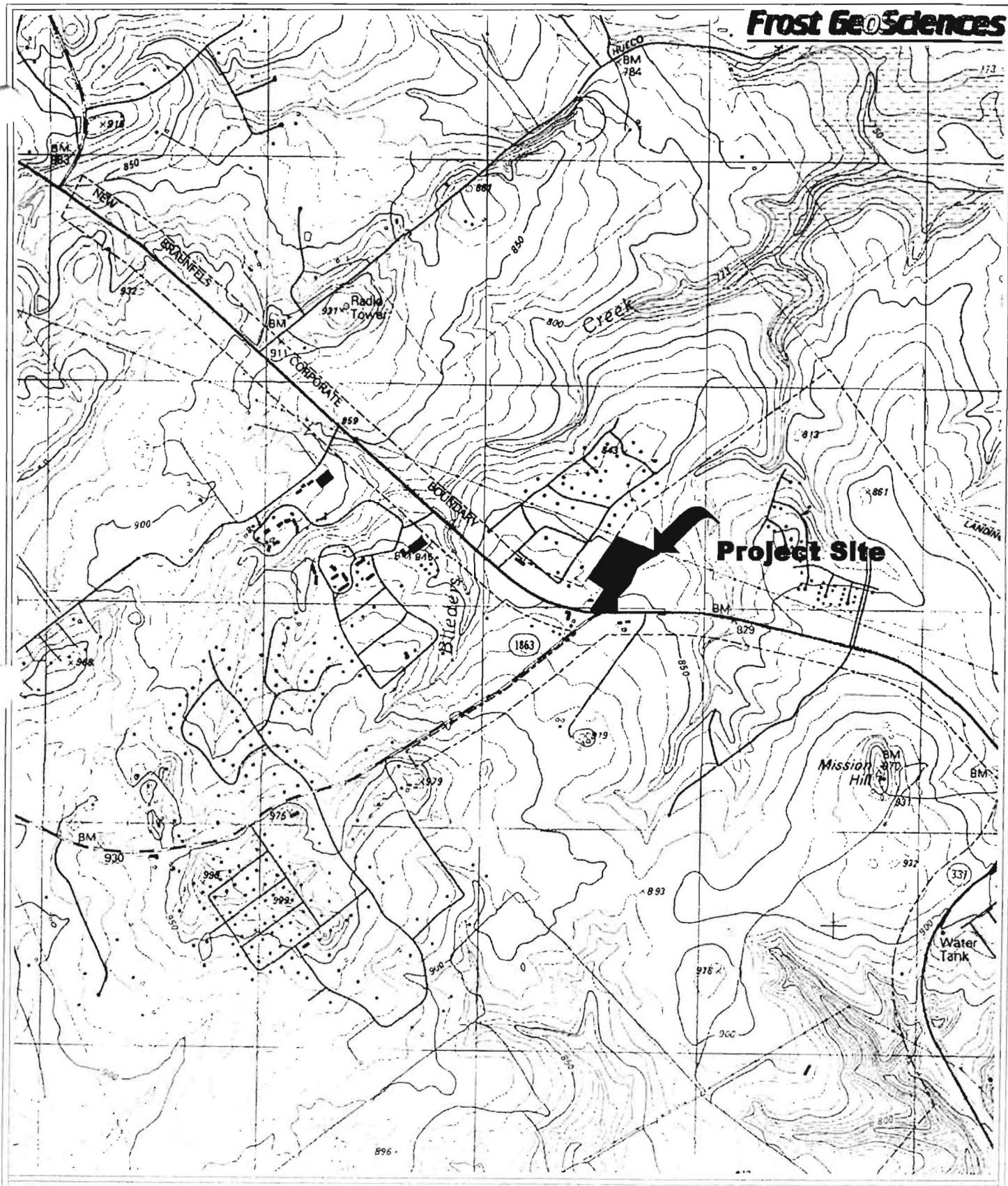


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

Street Map

PROJECT NO.: FGS-05206

DATE: June 20, 2005

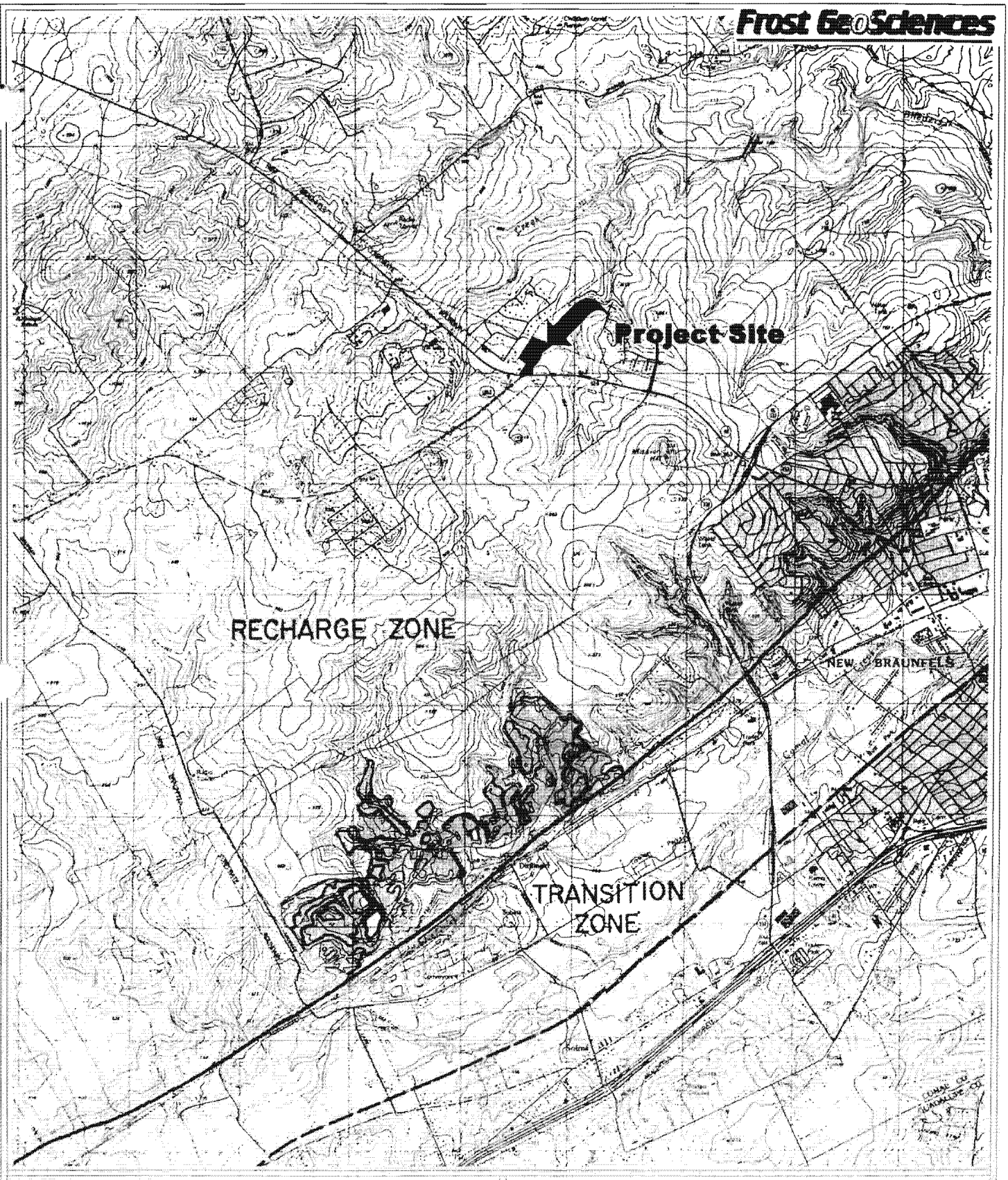


PROJECT NAME:

Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

U.S.G.S. 7.5 Minute Quadrangle Map
New Braunfels West, Texas Sheet (1988)

PROJECT NO.:	DATE:
FGS-05206	June 20, 2005

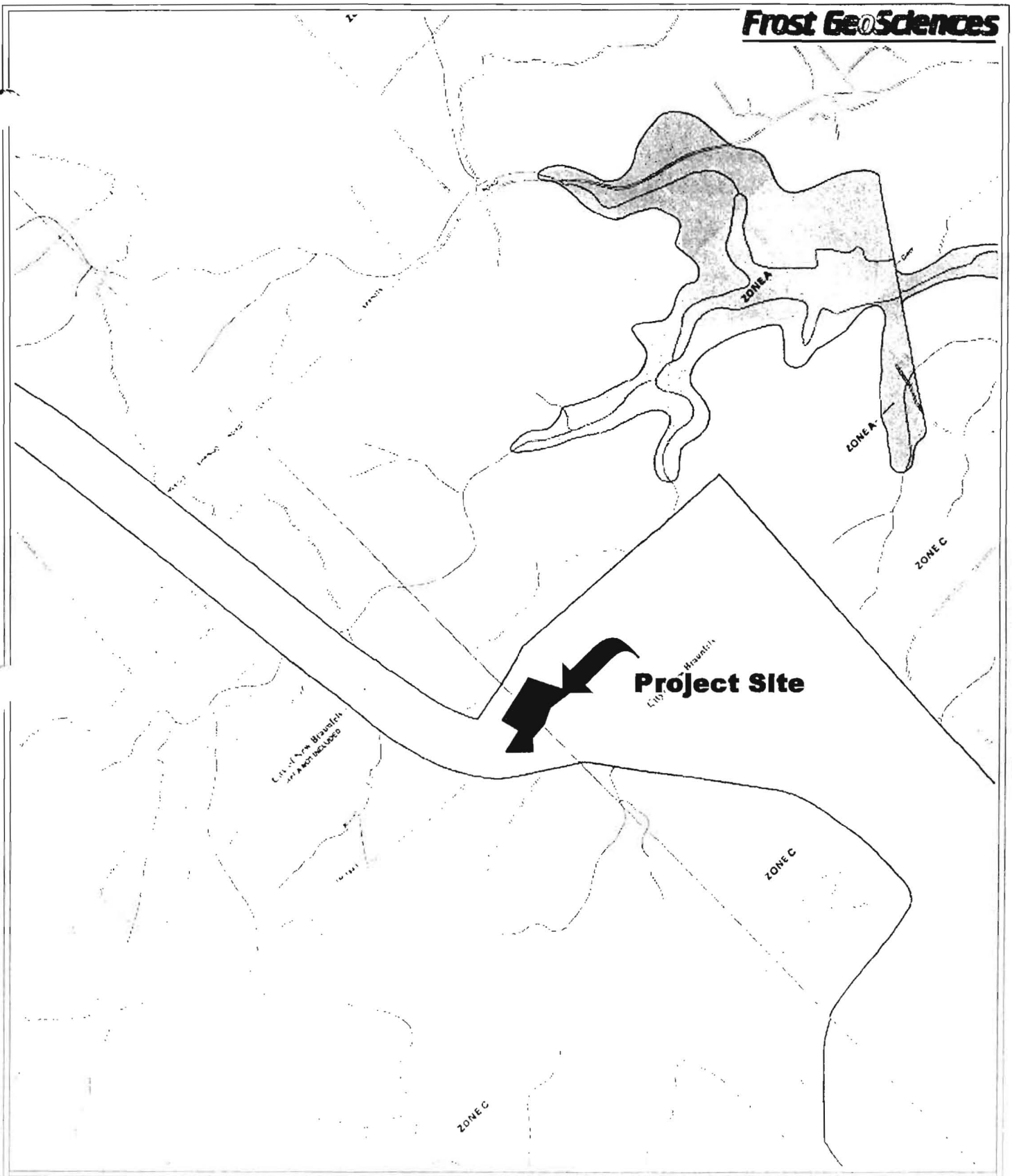


PROJECT NAME:

Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

Official Edwards Aquifer Recharge Zone Map
New Braunfels West, Texas Sheet 1988

PROJECT NO.:	DATE:
FGS-05206	June 20, 2005

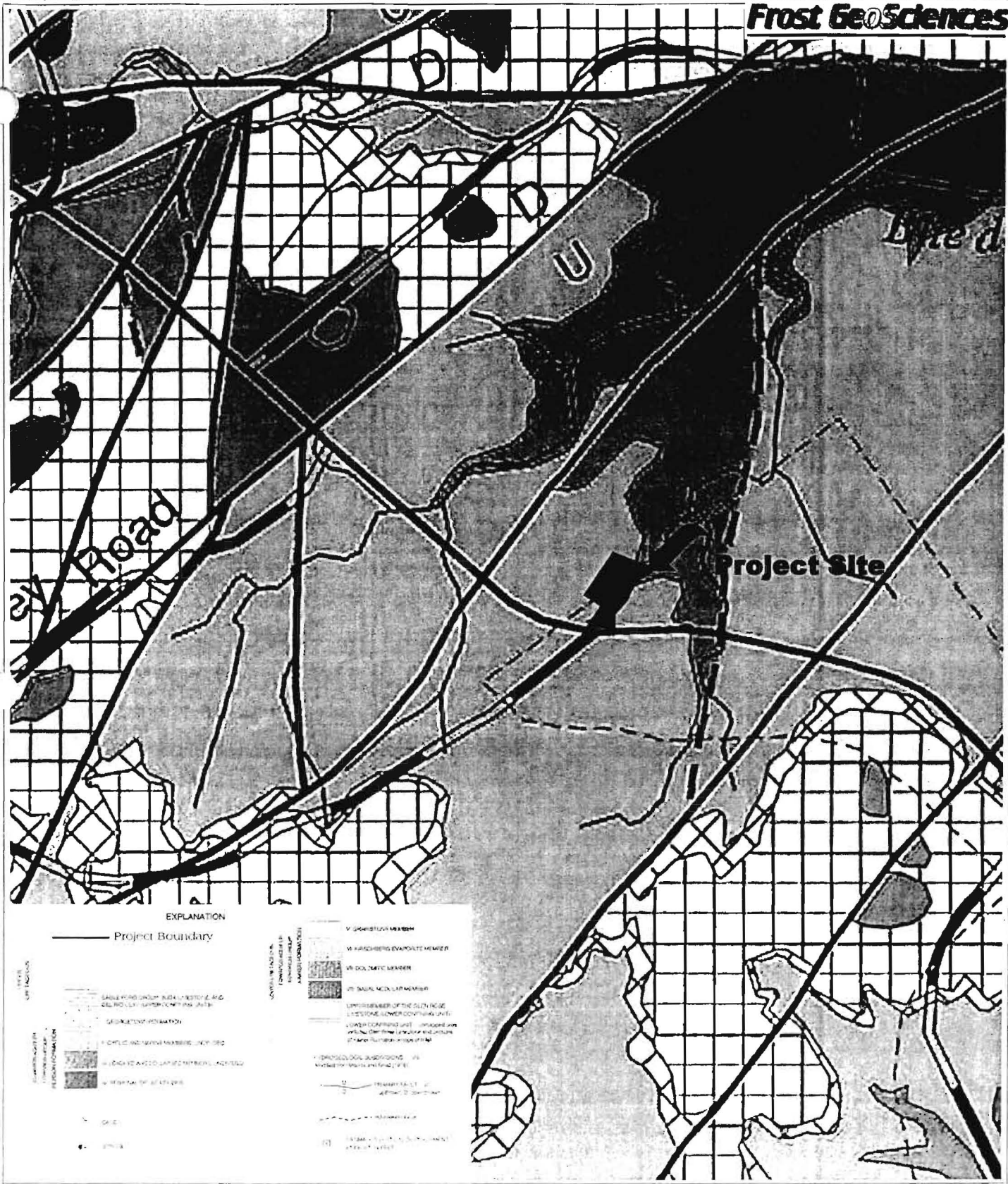


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

Flood Insurance Rate Map (FIRM)
Community Panel
4854630100C (9-29-86)

PROJECT NO.: FGS-05206

DATE: June 20, 2005

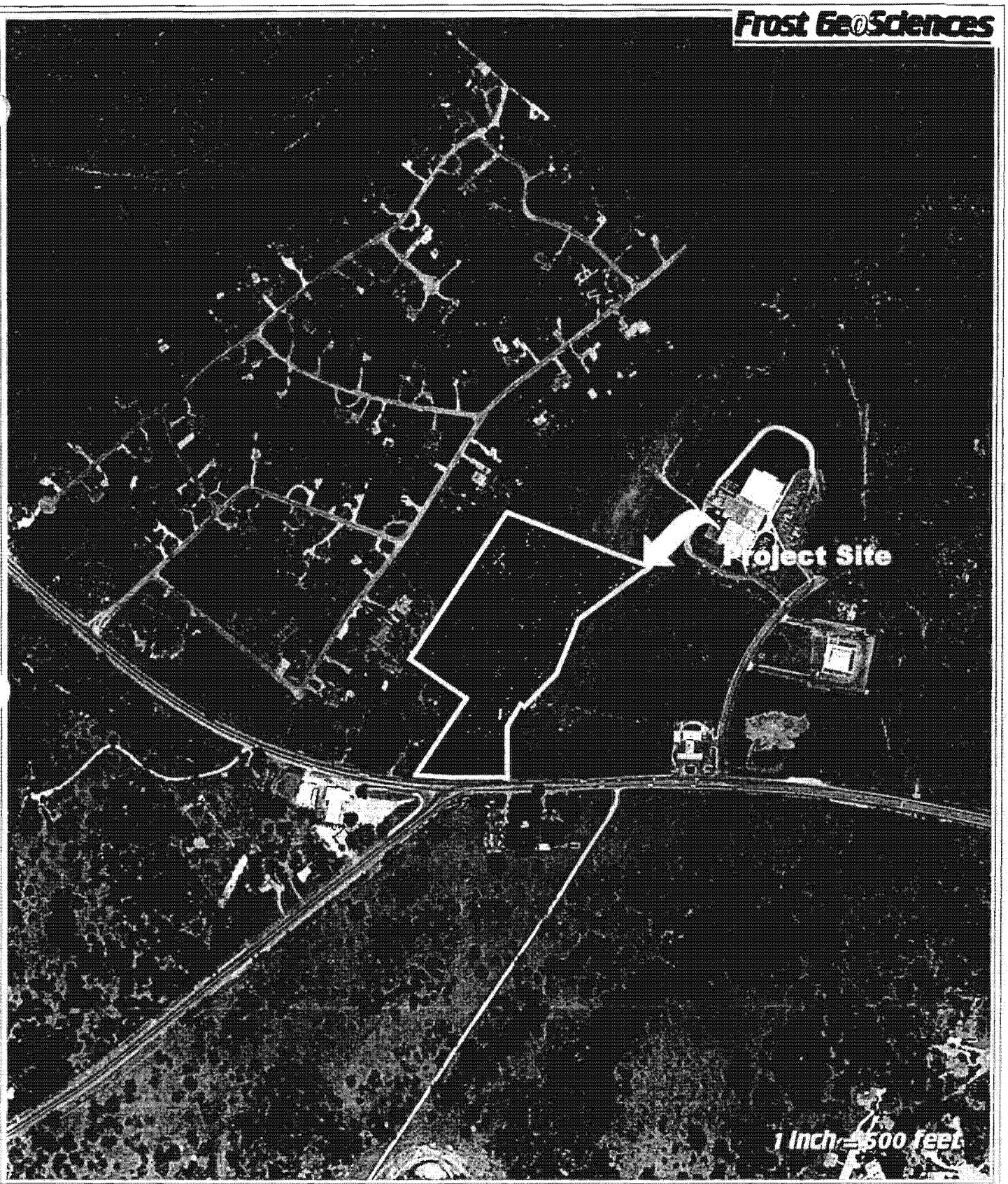


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

United States Geologic Survey
Water Resources Investigations #94-4117
Geologic Map of Comal County, Texas

PROJECT NO.:	DATE:
FGS-05206	June 20, 2005

Frost GeoSciences



PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

2003 Aerial Photograph
Landiscor Aerial Information

PROJECT NO.:	DATE:
FGS-05206	June 20, 2005

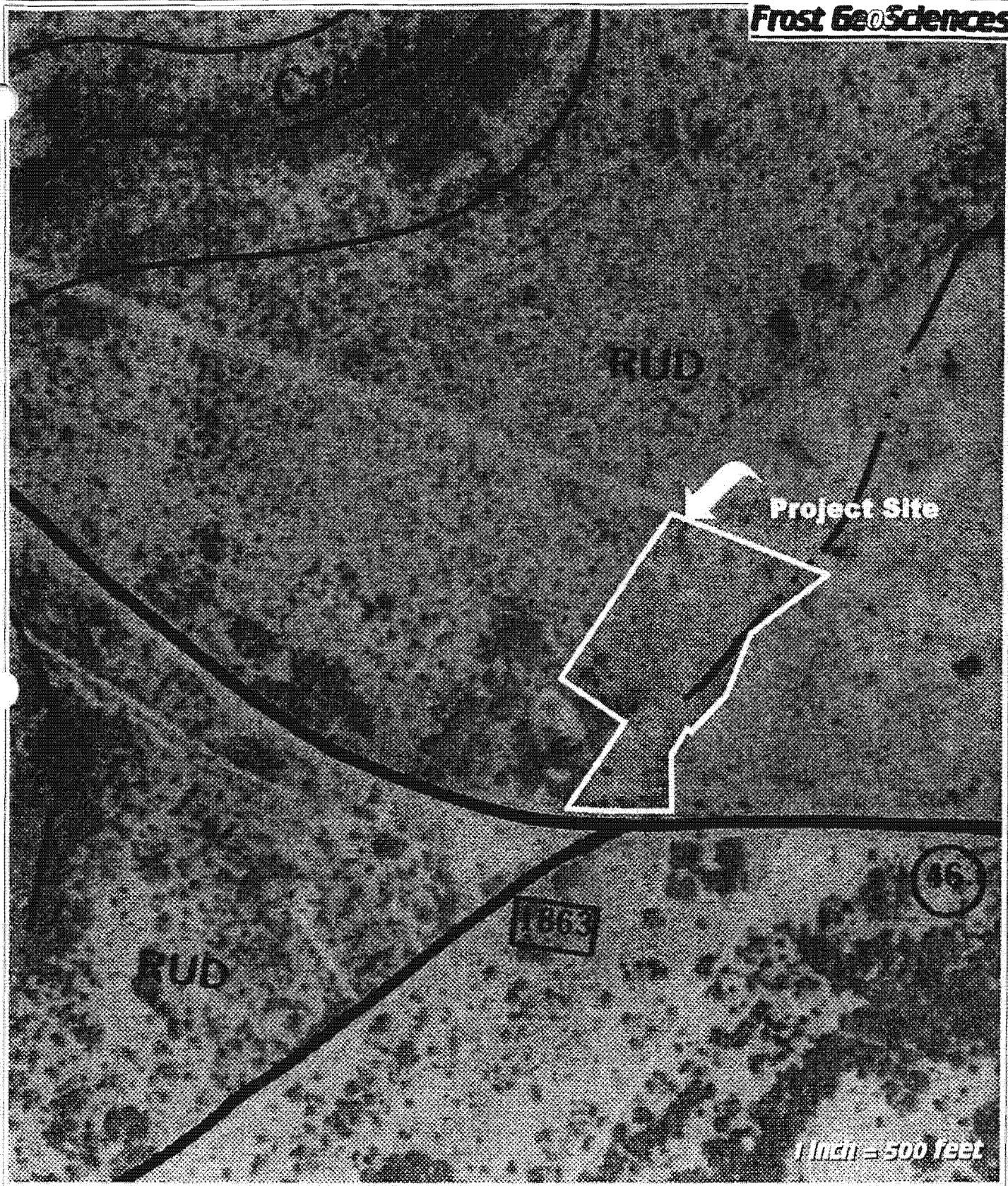


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

2003 Aerial Photograph with PRF's
Landiscor Aerial Information

PROJECT NO.: FGS-05206

DATE: June 20, 2005



PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
The New Braunfels Church of Christ
New Braunfels, Texas

1973 Aerial Photograph
U.S.D.A. Soil Survey of
Comal & Hays Counties, Texas

PROJECT NO.: FGS-03213

DATE: June 20, 2005

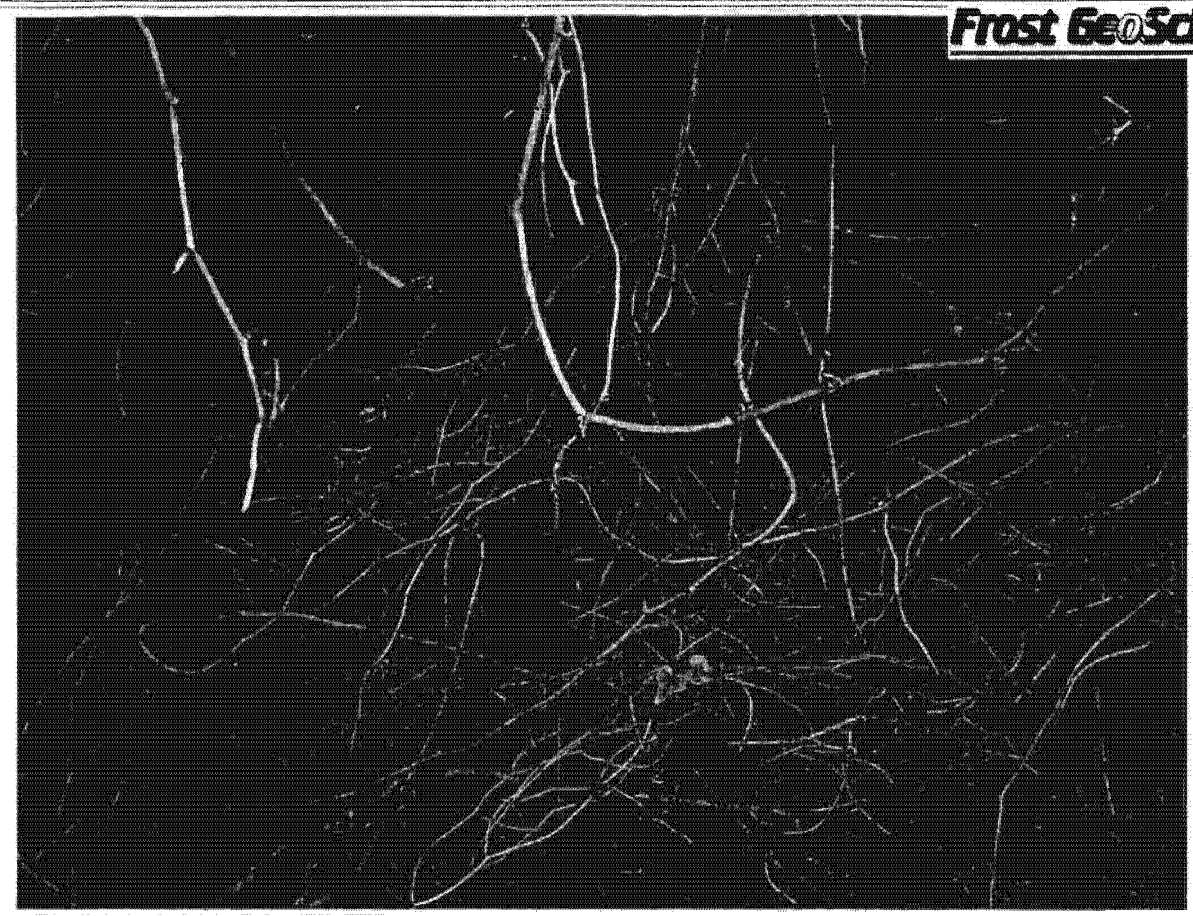
Appendix B



View to the east, of the project site along the southern property line.



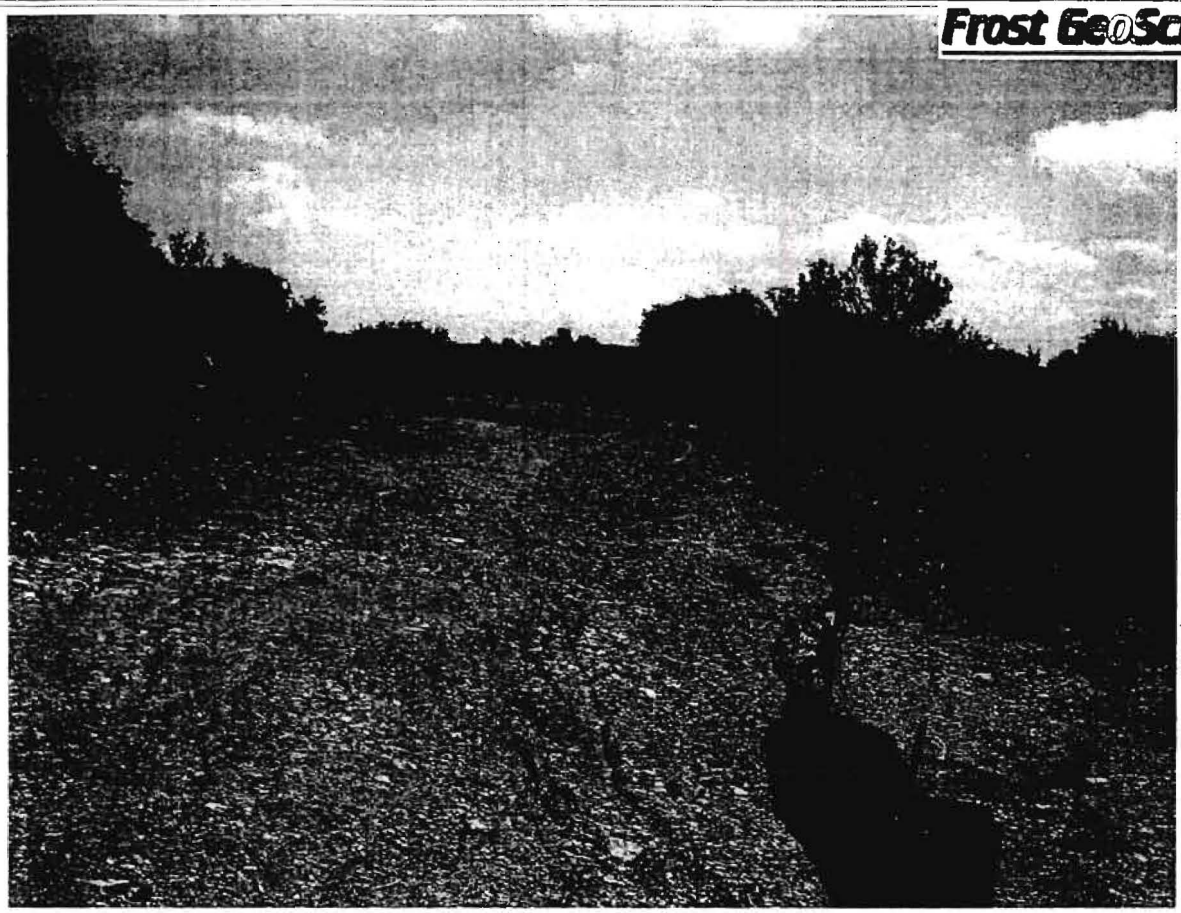
View to the west, of the project site along the southern property line.



View of Potential Recharge Feature #S-1.



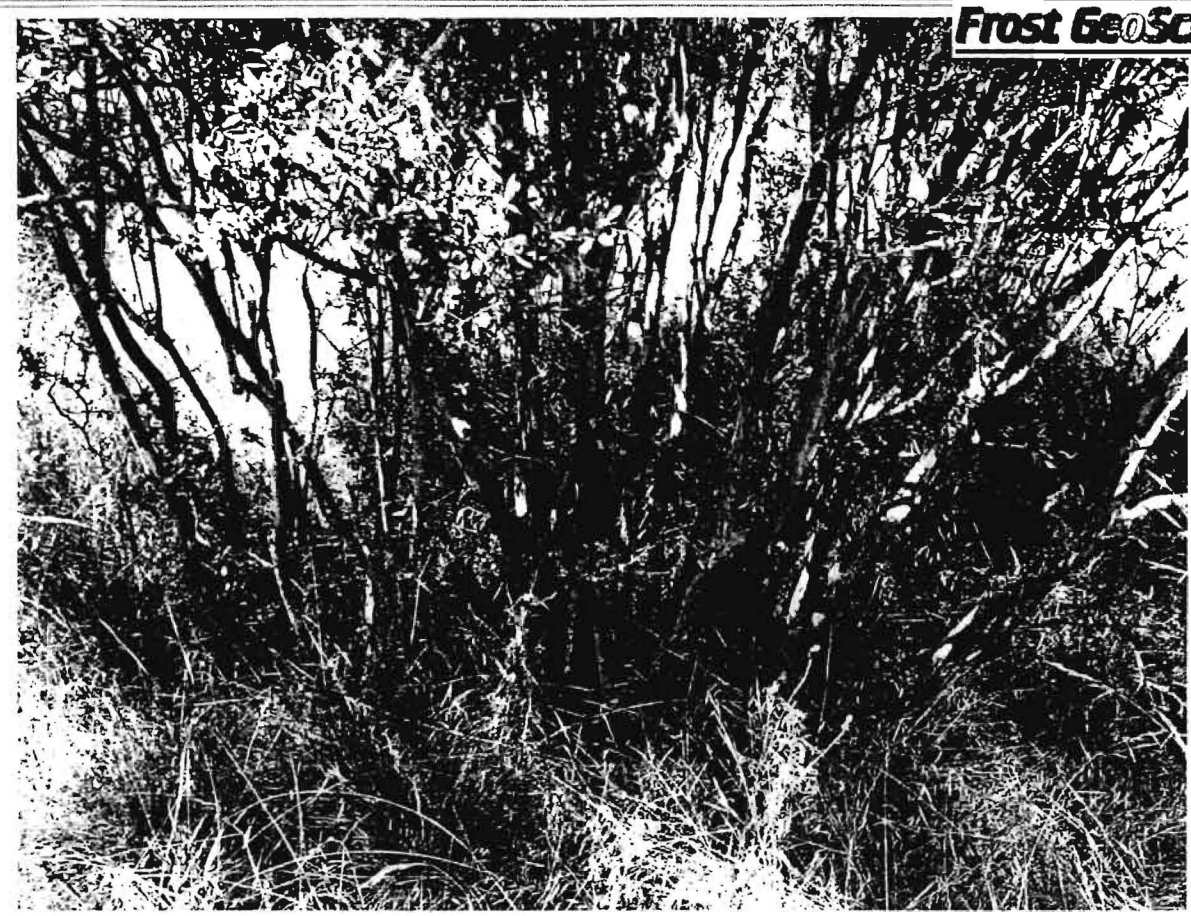
View of Potential Recharge Feature #S-2.



View to the northeast, of the project site from PRF #S-2.



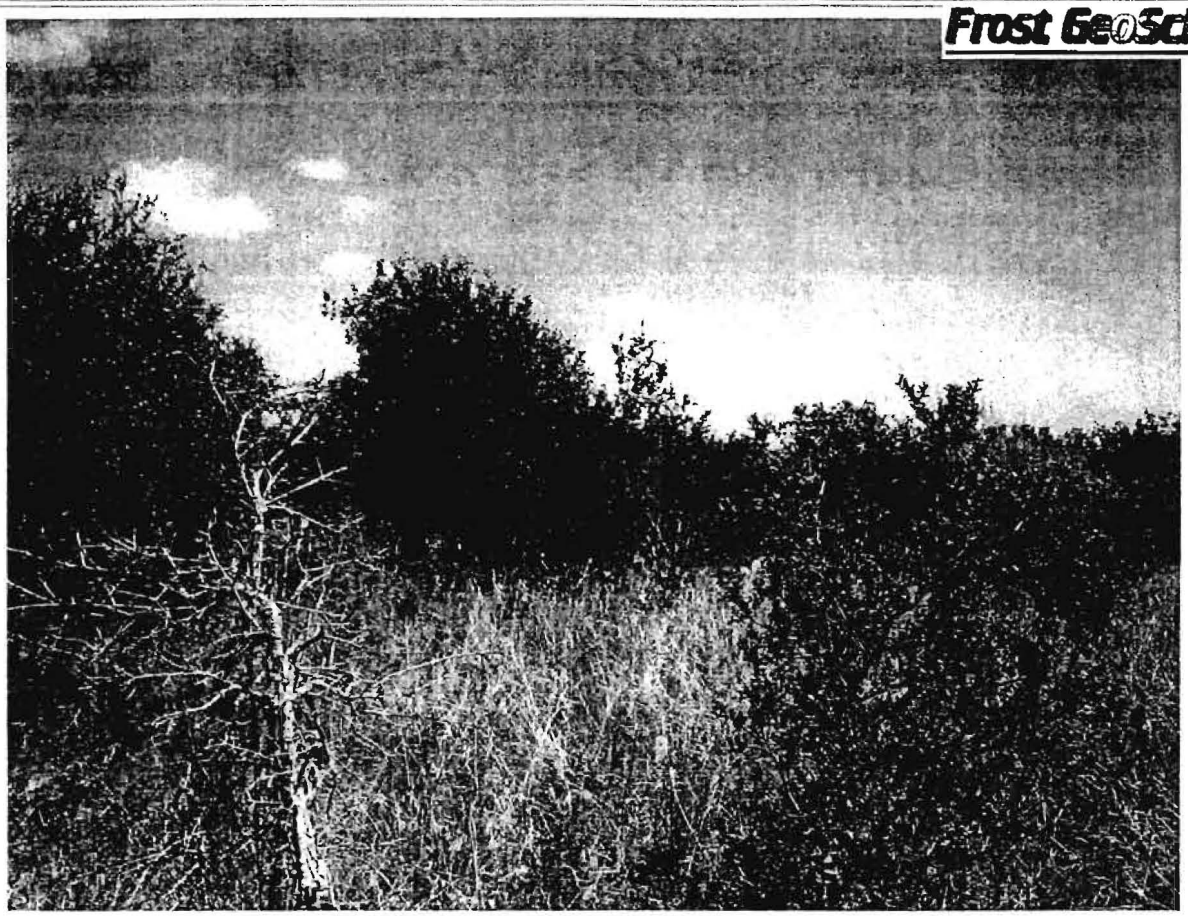
View of Potential Recharge Feature # S-3.



View of Potential Recharge Feature #S-4.



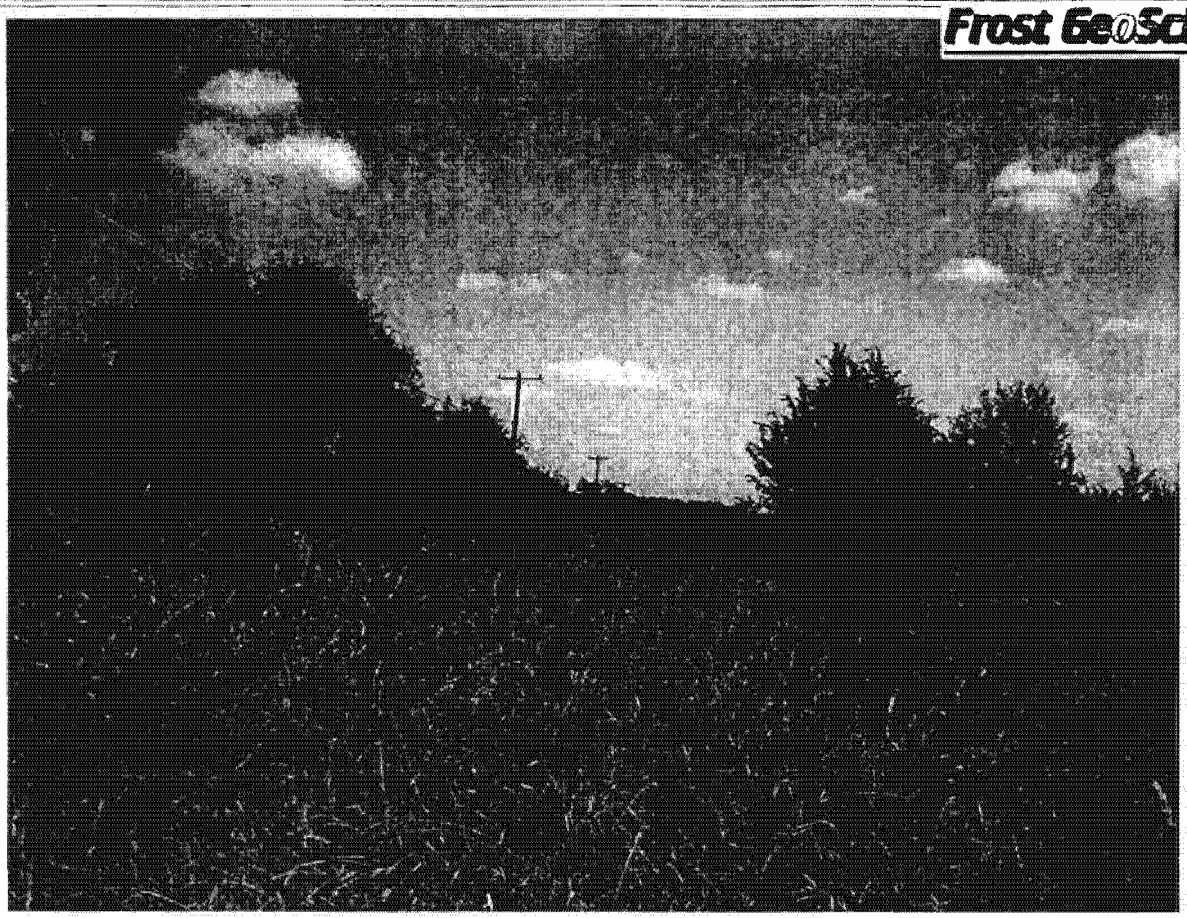
Typical view of vegetative cover on the project site near PRF #S-4.



Typical view of vegetative cover in the central portion of the project site.



Typical view of vegetative cover in the central portion of the project site.



View to the north, of the project site along the western property line.



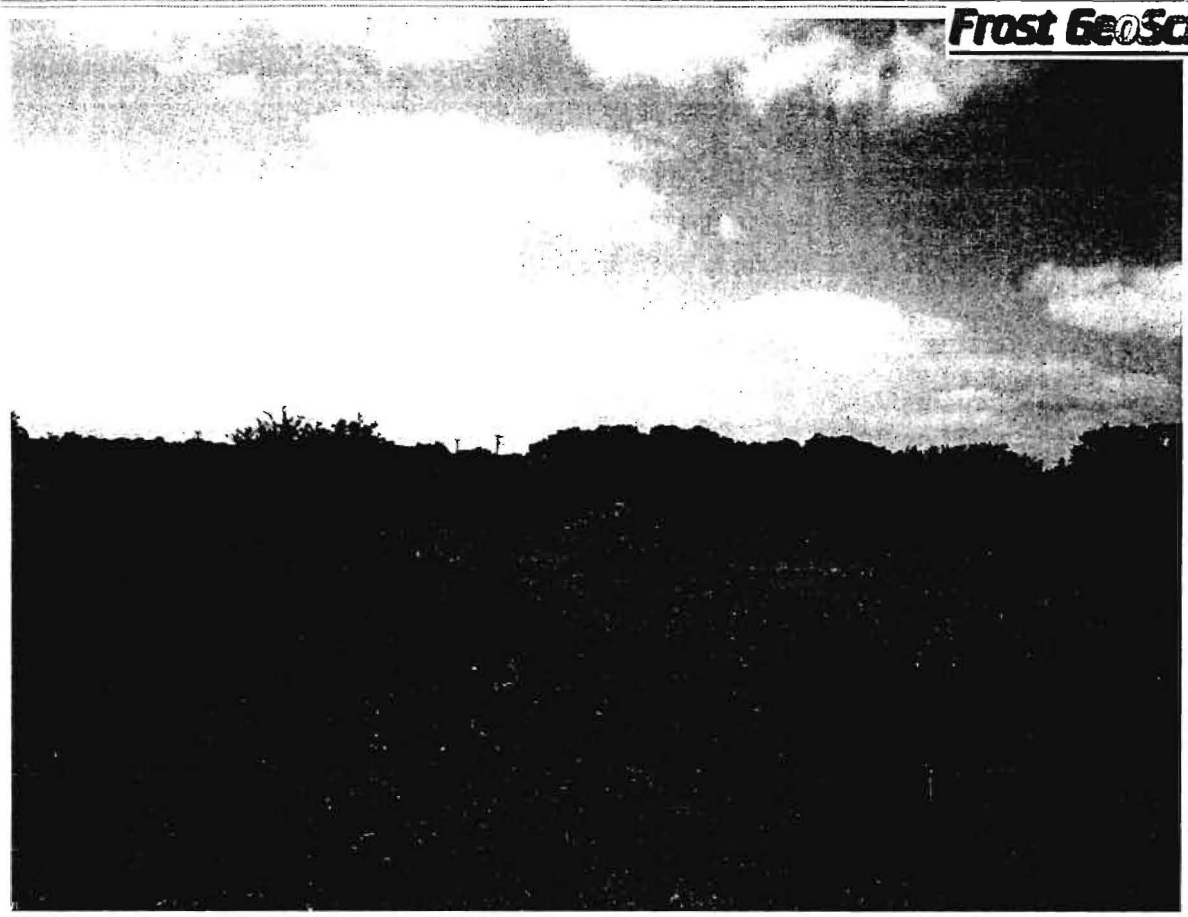
View to the south, of the project site along the western property line.



View of Potential Recharge Feature # S-5.



View of bulldozed scabs on a rock outcrop in the central portion of the project site.



Typical view of vegetative cover in the northern portion of the project site.



Typical view of vegetative cover in the northern portion of the project site.



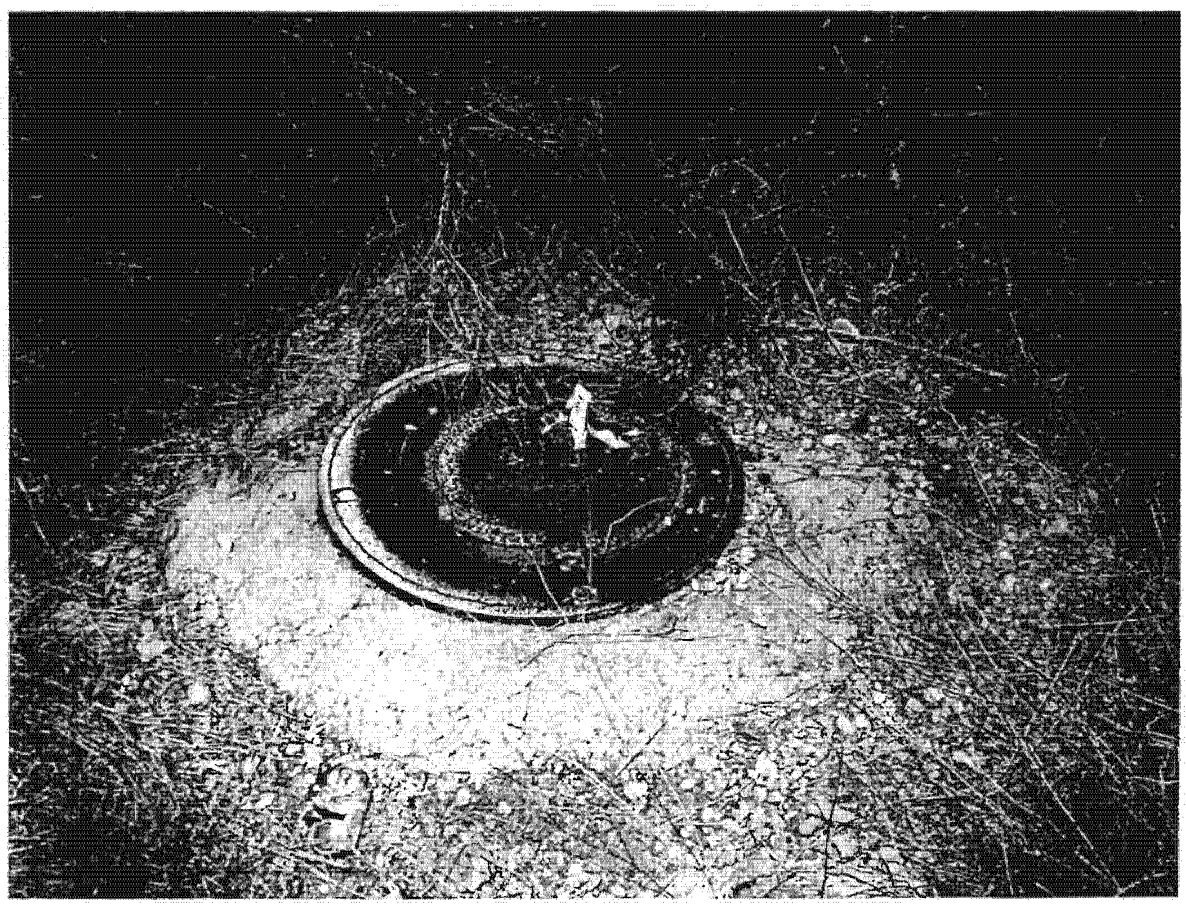
View to the east, of the project site along the northern property line.



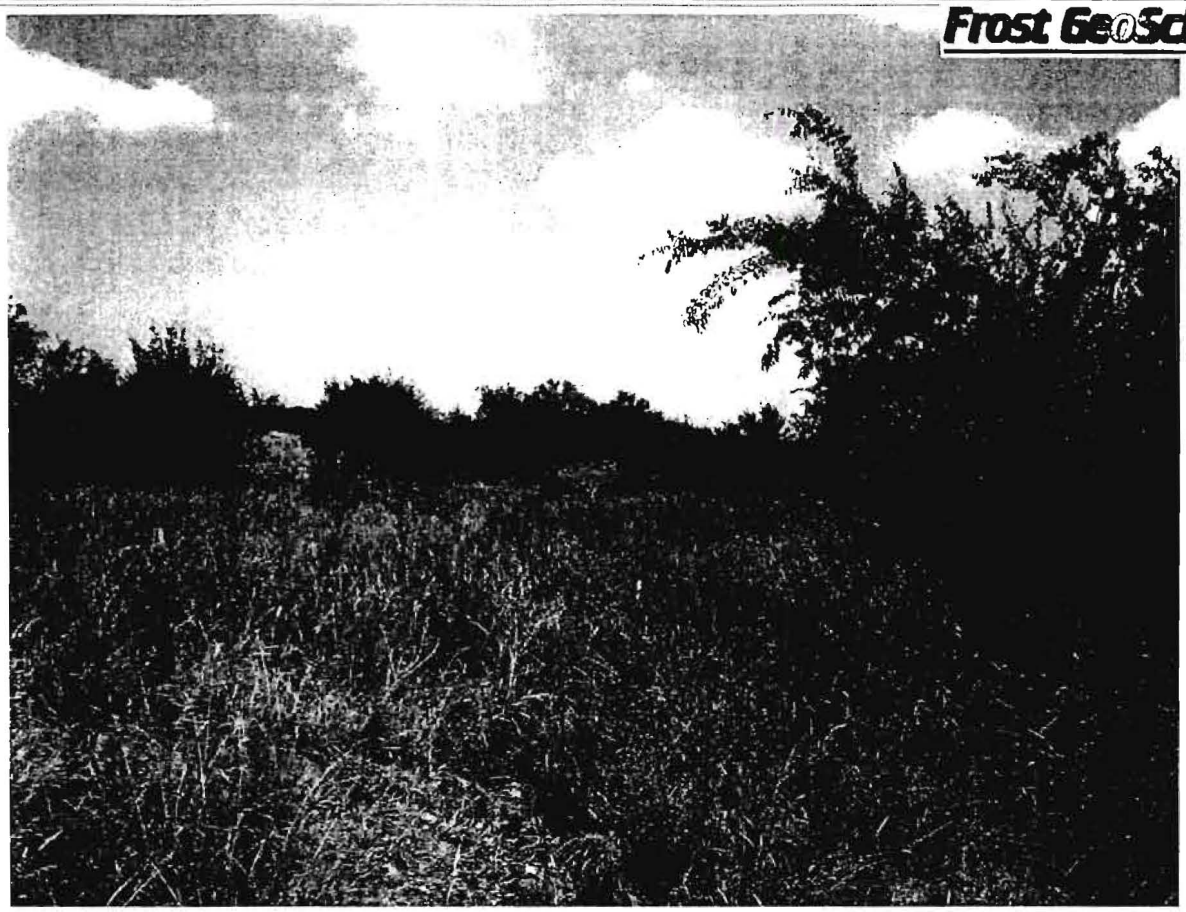
Typical view of rock outcrops in the northern portion of the project site.



View of Potential Recharge Feature #S-8.



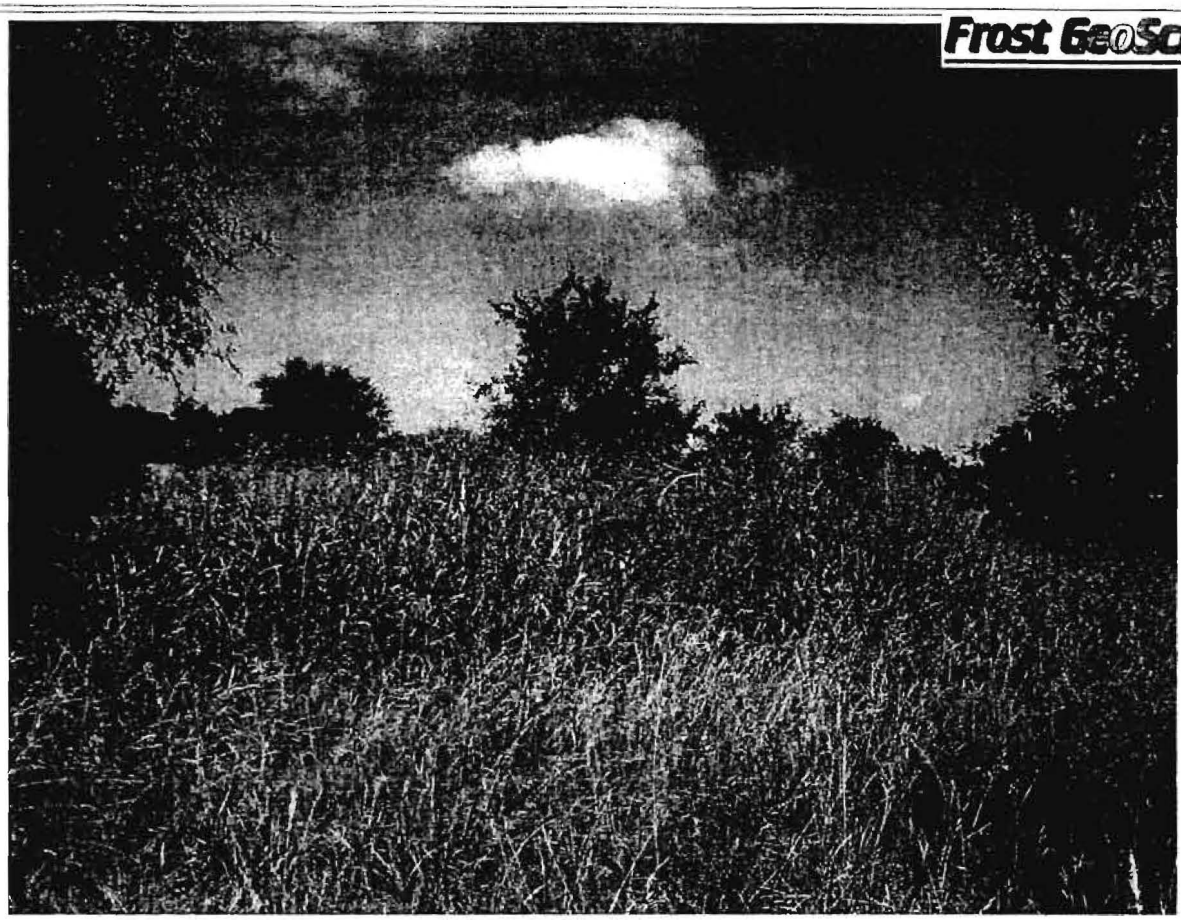
View of Potential Recharge Feature # S-9.



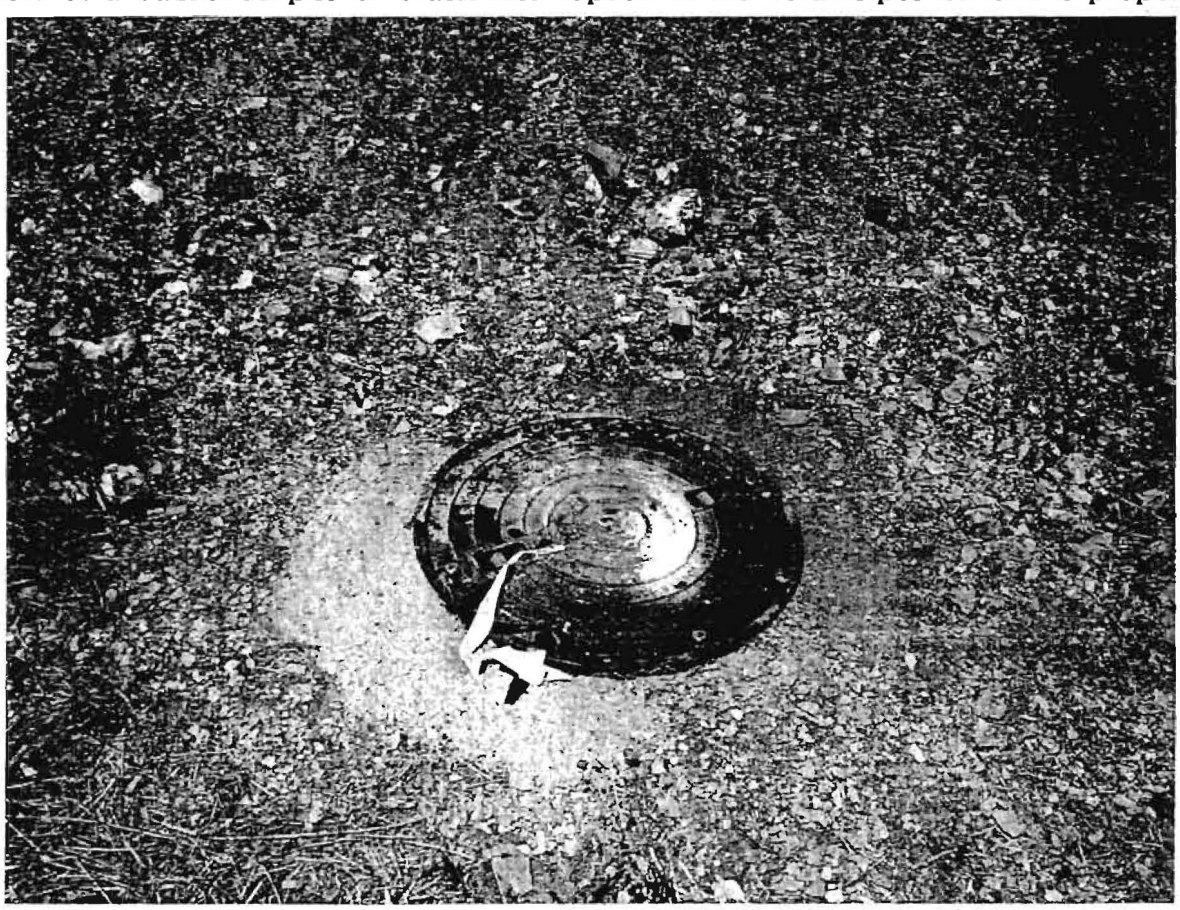
View to the northeast, of the project site along the eastern property line.



View to the southwest, of the project site along the eastern property line.



View of a bulldozed pile of brush and topsoil in the central portion of the property.



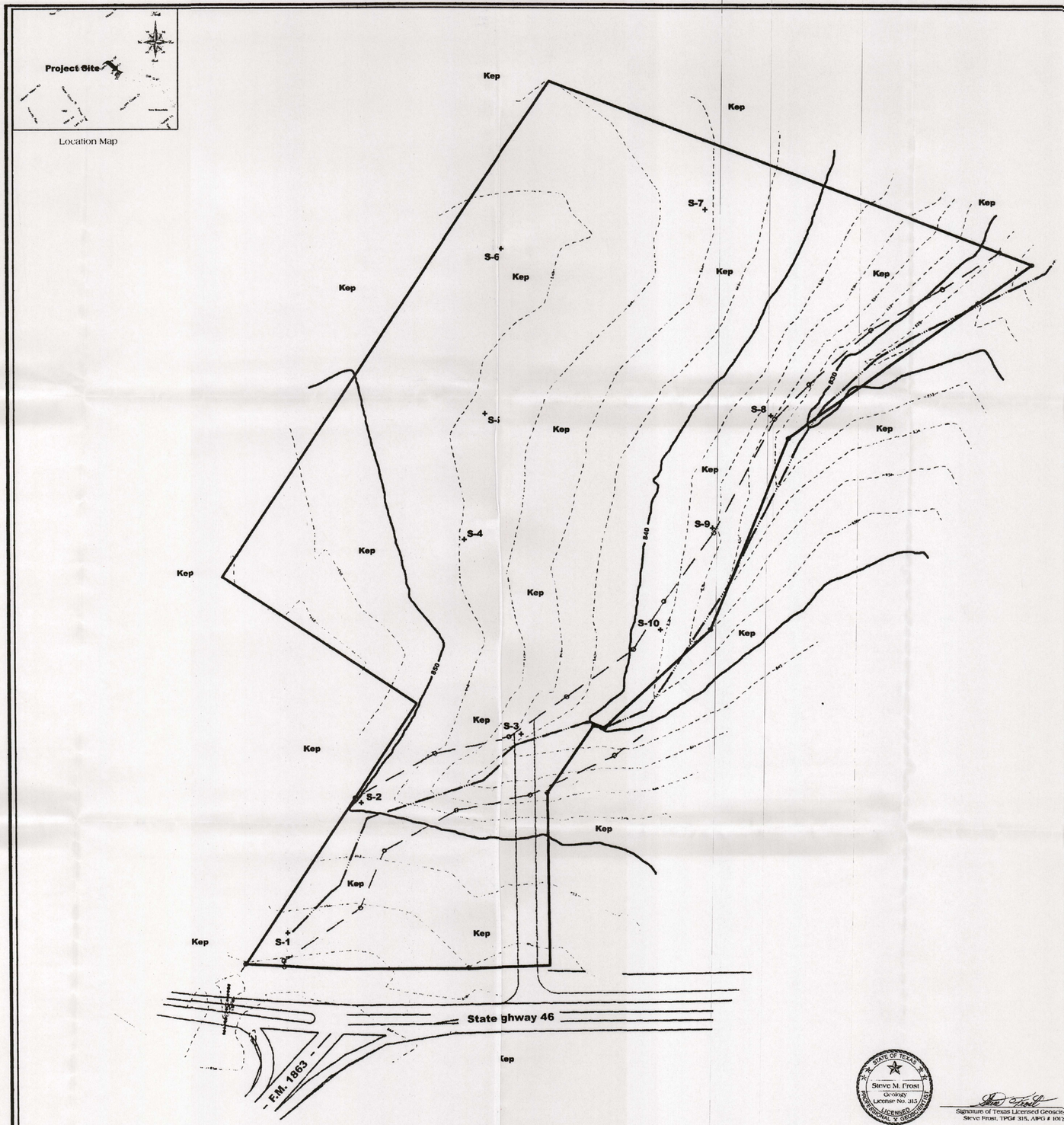
View of Potential Recharge Feature # S-10.



View of a bulldozed pile of brush and topsoil in the southeastern portion of the project site.



View to the north, along the eastern property line from the southeastern property corner.



Frost GeoSciences
Geologic and Environmental Consulting
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TCEQ-R13
JUN 08 2006
SAN ANTONIO

Site Geologic Map

Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
for the
New Braunfels Church of Christ
11.3 Acres
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-05206

Legend

- Fill - Fill Material
- Qal - Alluvium
- Kau - Austin Chalk
- Kef - Eagle Ford Shale
- Kbu - Buda Limestone
- Kdr - Del Rio Clay
- Kgt - Georgetown Limestone
- Kep - Edwards Person Limestone
- Kek - Edwards Kainer Limestone
- Kgr - Glen Rose Formation

- S-# - Potential Recharge Feature (PRF)
- Formation Contact
- 100-Year Floodplain - Zone A
- 100-Year Floodplain - Zone AE
- Other Flood Hazard Area - Zone X (shaded)

Floodplain Information Obtained From
FIRM: Flood Insurance Rate Map
Comal County, Texas: Panel # 48546301000C; Revised 9/29/86

Fault Information Obtained From:
Bureau of Economic Geology, Geologic Atlas of Texas, San Antonio Sheet (1983)
U.S. Geological Survey, Water Resources Investigations Report 94-4117 (1994)
Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000)

STATE OF TEXAS
Steve M. Frost
Geology
License No. 315
LICENSED
PROFESSIONAL GEOSCIENTIST

Signature of Texas Licensed Geoscientist
Steve Frost, TPG# 315, AIPG # 10176

North
NW NE
West East
SW SE
South

Graphic Scale
50 0 25 50 100
(In Feet)

1 inch = 50 feet
Representative Fraction 1:600

Contour Interval - 2 feet

WATER POLLUTION ABATEMENT PLAN APPLICATION

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

REGULATED ENTITY NAME: **New Braunfels Church of Christ**

REGULATED ENTITY INFORMATION

1. The type of project is:
   ___ Residential: # of Lots: _____
   ___ Residential: # of Living Unit Equivalents: _____
   ___ Commercial
   ___ Industrial
   ✓ Other: **Church**

2. Total site acreage (size of property): **11.306**

3. Projected population: **102 EDU's**

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

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	32,725	÷ 43,560 =	0.82
Parking	128,170	÷ 43,560 =	2.94
Other paved surfaces	0	÷ 43,560 =	0.00
Total Impervious Cover	168,895	÷ 43,560 =	3.76
Total Impervious Cover ÷ Total Acreage x 100 =			33.3 %

5. ✓ **ATTACHMENT A - Factors Affecting Water Quality.** A description of any factors that could affect surface water and groundwater quality is provided at the end of this form.

6. ✓ Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

FOR ROAD PROJECTS ONLY
Complete questions 7-12 if this application is exclusively for a road project.

7. Type of project:
   ___ TXDOT road project.
   ___ County road or roads built to county specifications.
   ___ City thoroughfare or roads to be dedicated to a municipality.
   ___ Street or road providing access to private driveways.

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

__ Concrete
__ Asphaltic concrete pavement
__ Other:

9. Length of Right of Way (R.O.W.): _____ feet.
Width of R.O.W.: _____ feet.
L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = _____ acres.

10. Length of pavement area: _____ feet.
Width of pavement area: _____ feet.
L x W = _____ Ft^2 ÷ 43,560 Ft^2/Acre = _____ acres.
Pavement area _____ acres ÷ R.O.W. area _____ acres x 100 = ___% impervious cover.

11. __ A rest stop will be included in this project.
__ A rest stop will **not** be included in this project.

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

STORMWATER TO BE GENERATED BY THE PROPOSED PROJECT

13. **ATTACHMENT B - Volume and Character of Stormwater.** A description of the volume and character (quality) of the stormwater runoff which is expected to occur from the proposed project is provided at the end of this form. The estimates of stormwater runoff quality and quantity should be based on area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

WASTEWATER TO BE GENERATED BY THE PROPOSED PROJECT

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

100 % Domestic	76,500 gallons/day
___ % Industrial	_____ gallons/day
___ % Commingled	_____ gallons/day

TOTAL 76,500 gallons/day
Peak Volume: 750 GPD/EDU (102 EDU) = 76,500 GPD
Average Volume: 300 GPD/EDU (102 EDU) = 30,600 GPD

15. Wastewater will be disposed of by:
__ **On-Site** Sewage Facility (OSSF/Septic Tank):
ATTACHMENT C - Suitability Letter from Authorized Agent. An on-site sewage facility will be used to treat and dispose of the wastewater. The appropriate licensing authority's (authorized agent) written approval is provided at the end of this form. It states that the land is suitable for the use of an on-site sewage facility or identifies areas that are not suitable.
__ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

✓ Sewage Collection System (Sewer Lines):

- ✓ Private service laterals from the wastewater generating facilities will be connected to an existing SCS.
- __ Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.
  - __ The SCS was previously submitted on _____.
  - __ The SCS was submitted with this application.
  - __ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to executive director approval.

The sewage collection system will convey the wastewater to the **Gruene Treatment Plant** (name) Treatment Plant. The treatment facility is :

- ✓ existing.
- __ proposed.

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

SITE PLAN REQUIREMENTS

Items 17 through 27 must be included on the Site Plan.

17. The Site Plan must have a minimum scale of 1" = 400'.
    Site Plan Scale: 1" = **50** '.

18. 100-year floodplain boundaries
    - __ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
    - ✓ No part of the project site is located within the 100-year floodplain.

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

    _____

    _____

19. ✓ The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Show lots, recreation centers, buildings, roads, etc.
    - __ The layout of the development is shown with existing contours. Finished topographic contours will not differ from the existing topographic configuration and are not shown.

20. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):
    - ✓ There are 0 (#) 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.

21. Geologic or manmade features which are on the site:
    - __ All **sensitive and possibly sensitive** geologic or manmade features identified in the Geologic Assessment are shown and labeled.

✓ No **sensitive and possibly sensitive** geologic or manmade features were identified in the Geologic Assessment.

__ **ATTACHMENT D - Exception to the Required Geologic Assessment.** An exception to the Geologic Assessment requirement is requested and explained in ATTACHMENT D provided at the end of this form. Geologic or manmade features were found and are shown and labeled.

__ **ATTACHMENT D - Exception to the Required Geologic Assessment.** An exception to the Geologic Assessment requirement is requested and explained in ATTACHMENT D provided at the end of this form. No geologic or manmade features were found.

22. ✓ The drainage patterns and approximate slopes anticipated after major grading activities.

23. ✓ Areas of soil disturbance and areas which will not be disturbed.

24. ✓ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.

25. ✓ Locations where soil stabilization practices are expected to occur.

26. ✓ Surface waters (including wetlands).

27. ✓ Locations where stormwater discharges to surface water or sensitive features.
__ There will be no discharges to surface water or sensitive features.

ADMINISTRATIVE INFORMATION

28. ✓ One (1) original and three (3) copies of the completed application have been provided.

29. ✓ Any modification of this WPAP will require TCEQ executive director 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 FORM** is hereby submitted for TCEQ review and executive director approval. The form was prepared by:

Max F. Terry, P.E.
Print Name of Customer/Agent

Max F. Terry, P.E.
Signature of Customer/Agent

01/26/06
Date

ATTACHMENT A

Factors Affecting Water Quality

There are factors that could affect surface groundwater quality both during and after construction. During construction contamination could come from oil, grease, diesel or gasoline drippings from construction equipment and also from the process of excavation materials and grading. If fuel or a hazardous substance spill occurs, the contaminated soil will be remove and placed in an impervious container to be disposed offsite at an approved disposal location. The placement of excavated materials will have appropriately sized erosion and sedimentation controls placed downgradient.

After construction is complete, the potential sources of contamination would be from sediments brought onsite by vehicles, fuel, oil and grease from vehicles, fertilizers used for lawn care and pesticides used by the individual homeowners.

ATTACHMENT B

Volume and Character of Stormwater

The stormwater runoff for the preconstruction conditions of the 11.306 acres would be across rock soil, with native vegetation consisting of grasses, brush and trees to an existing swale that runs through the property. The existing drainage swale will remain untouched with all the construction activities will remain outside it limits.

The drainage area being considered is the total site which is 11.3 acres. The existing drainage area is undeveloped with slopes between 3% and 6%. The City of New Braunfels runoff coefficients for the Rational Formula is 0.38 for undeveloped range areas and a time of concentration of 21.0 minutes was used. The existing 25-year runoff is calculated to be 30.3 cfs. The post-construction runoff coefficient is calculated to be 0.53 which provides an anticipated 25-year stormwater runoff would be 67.9 cfs. The detention basin will be sized to contain the additional runoff that is developed due to the proposed construction.

The characteristic of the stormwater generated onsite will be influenced by site features that generate non-point sources of pollution. Non-point sources will include: oil and grease from the pavement areas, suspended solids, sedimentation, nutrients for lawn care, possible pesticides, and herbicides used by landowner. The stormwater runoff would discharge into a tributary of Blieders Creek.

ATTACHMENT C

Suitability Letter from Authorized Agent

Not Applicable

ATTACHMENT D

Exception to the Required Geologic Assessment

Not Applicable

Temporary Stormwater Section

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

REGULATED ENTITY NAME: **New Braunfels Church of Christ**

POTENTIAL SOURCES OF CONTAMINATION

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

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

   __ 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.
   __ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
   __ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An **Aboveground Storage Tank Facility Plan** application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.
   ✓ Fuels and hazardous substances will not be stored on-site.

2. ✓ **ATTACHMENT A - Spill Response Actions**. A description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is provided at the end of this form.

3. n/a Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

4. ✓ **ATTACHMENT B - Potential Sources of Contamination.** Describe in an attachment at the end of this form any other activities or processes which may be a potential source of contamination.
   __ The are no other potential sources of contamination.

SEQUENCE OF CONSTRUCTION

5. ✓ **ATTACHMENT C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is provided at the end of this form. For each activity described, an estimate of the total area of the site to be disturbed by each activity is given.

6. ✓ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project:

TEMPORARY BEST MANAGEMENT PRACTICES (TBMPs)

Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt

fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. **All structural BMPs must be shown on the site plan.**

7. ✓ **ATTACHMENT D - Temporary Best Management Practices and Measures.** A description of the TBMPs and measures that will be used during and after construction are provided at the end of this form. For each activity listed in the sequence of construction, include appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

   ✓ TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information has been provided in the attachment at the end of this form

   a. A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

   b. A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

   c. A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

   d. A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

   ___ **ATTACHMENT E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is provided at the end of this form. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

   ✓ There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. ✓ **ATTACHMENT F - Structural Practices.** Describe the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains has been avoided.

10. ✓ **ATTACHMENT G - Drainage Area Map.** A drainage area map is provided at the end of this form to support the following requirements.

    ___ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

    ___ For areas that will have more than 10 acres within a common drainage area

disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

— For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

✓ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

11. n/a **ATTACHMENT H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure has been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are provided as at the end of this form.

12. ✓ **ATTACHMENT I - Inspection and Maintenance for BMPs.** A plan for the inspection of temporary BMPs and measures and for their timely maintenance, repair, and, if necessary, retrofit is provided at the end of this form. A description of documentation procedures and recordkeeping practices is included in the plan.

13. ✓ All control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicates a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. ✓ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. ✓ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. ✓ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

SOIL STABILIZATION PRACTICES

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

17. ✓ **ATTACHMENT J - Schedule of Interim and Permanent Soil Stabilization Practices.** A schedule of the interim and permanent soil stabilization practices for the site is attached at the end of this form.

18. ✓ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. ✓ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

ADMINISTRATIVE INFORMATION

20. ✓ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

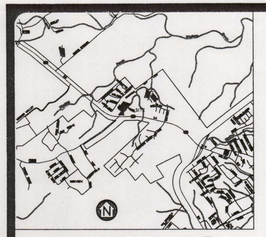
21. ✓ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

22. ✓ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

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

Max F. Terry, P.E.
Print Name of ~~Customer~~/Agent

Max F. Terry P.E. 07/05/05
Signature of ~~Customer~~/Agent Date



LOCATION MAP
N.T.S.

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
WATER POLLUTION ABATEMENT PLAN
GENERAL CONSTRUCTION NOTES

1. Written construction notification must be given to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulate activity. Information must included the date on which the regulated activity will commence, the name of the approved plan for the regulated activity,and the name of the prime contractor and the name and telephone number of the contact person.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved pan and approval letter.

3. If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive features may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.

4. 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.

5. All temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.

6. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

7. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

11. The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.

12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

A. any physical or operational modification of any water pollution abatement structure(s). including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;

B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;

C. any development or land previously identified as undeveloped in the original water pollution abatement plan.

NOTES:

1. The construction activities associated with this project must meet all applicable criteria of the Texas Natural Resource Conservation Commission set forth in 30 Texas Administrative Code (TAC) 213.5(b) – Water Pollution Abatement Plan for Regulated Activities undertaken on the recharge zone of the Edwards Aquifer.

2. Temporary erosion and sedimentation controls are required during construction. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized. The temporary erosion and sedimentation controls must be inspected periodically for damage caused by construction activities and following every rainfall. Damaged or obstructed controls must be repaired or replaced as necessary to maintain proper operation.

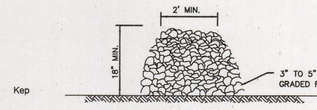
3. If any sensitive feature is discovered during construction, regulated activities near the sensitive feature must be suspended immediately. The owner must immediately notify the appropriate regional office of the Texas Natural Resource Conservation Commission of the sensitive feature discovered. The regulated activities near the sensitive feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

4. Any modification to the approved Water Pollution Abatement Plan must be submitted to the appropriate regional office for approval by the executive director of the Texas Natural Resource Conservation Commission before construction of the proposed modification may commence.

5. All contractors conducting regulated activities associated with this project must be provided with copies of the approved Water Pollution Abatement Plan and the TNRCC letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approved letter.

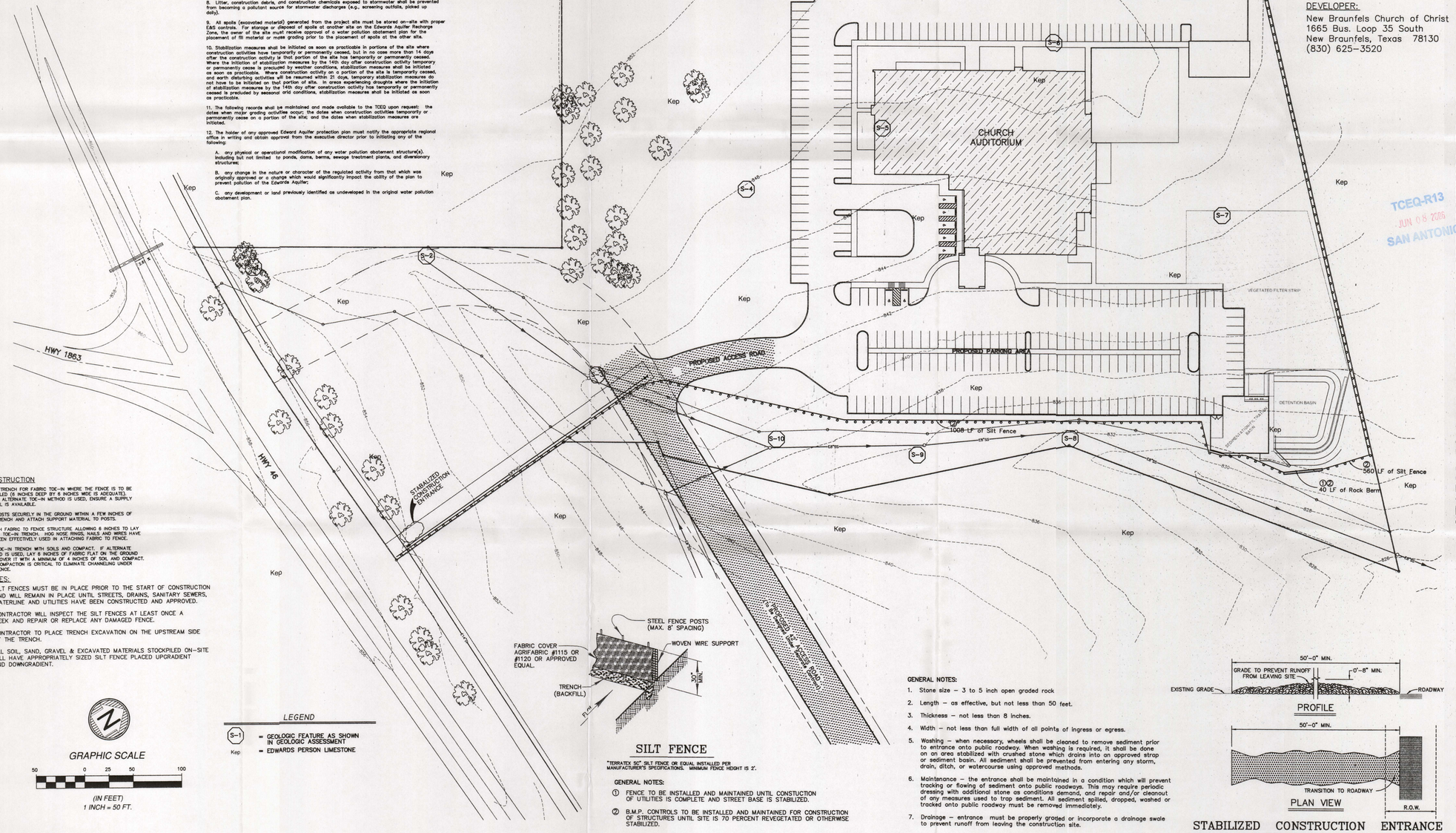
INSTALLATION

- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- THE ROCK BERM SHALL BE REMOVED WHEN THE SITE IS 75 PERCENT REVEGETATED OR OTHERWISE STABILIZED.



CROSS-SECTION
ROCK BERM
NTS

DEVELOPER:
New Braunfels Church of Christ
1665 Bus. Loop 35 South
New Braunfels, Texas 78130
(830) 625-3520



CONSTRUCTION

DIG A TRENCH FOR FABRIC TOE-IN WHERE THE FENCE IS TO BE INSTALLED (6 INCHES DEEP BY 6 INCHES WIDE IS ADEQUATE). IF THE ALTERNATE TOE-IN METHOD IS USED, ENSURE A SUPPLY OF SOIL IS AVAILABLE.

SET POSTS SECURELY IN THE GROUND WITHIN A FEW INCHES OF THE TRENCH AND ATTACH SUPPORT MATERIAL TO POSTS.

ATTACH FABRIC TO FENCE STRUCTURE ALLOWING 6 INCHES TO LAY IN THE TOE-IN TRENCH. HOG NOSE RINGS, NAILS AND WIRES HAVE ALL BEEN EFFECTIVELY USED IN ATTACHING FABRIC TO FENCE.

FILL TOE-IN TRENCH WITH SOILS AND COMPACT. IF ALTERNATE METHOD IS USED, LAY 6 INCHES OF FABRIC FLAT ON THE GROUND AND COVER IT WITH A MINIMUM OF 4 INCHES OF SOIL AND COMPACT. SOIL COMPACTION IS CRITICAL TO ELIMINATE CHANNELING UNDER THE FENCE.

NOTES:

1. SILT FENCES MUST BE IN PLACE PRIOR TO THE START OF CONSTRUCTION AND WILL REMAIN IN PLACE UNTIL STREETS, DRAINS, SANITARY SEWERS, WATERLINE AND UTILITIES HAVE BEEN CONSTRUCTED AND APPROVED.
2. CONTRACTOR WILL INSPECT THE SILT FENCES AT LEAST ONCE A WEEK AND REPAIR OR REPLACE ANY DAMAGED FENCE.
3. CONTRACTOR TO PLACE TRENCH EXCAVATION ON THE UPSTREAM SIDE OF THE TRENCH.
4. ALL SOIL, SAND, GRAVEL & EXCAVATED MATERIALS STOCKPILED ON-SITE WILL HAVE APPROPRIATELY SIZED SILT FENCE PLACED UPGRADIENT AND DOWNGRADIENT.

GRAPHIC SCALE
50 0 25 50 100
(IN FEET)
1 INCH = 50 FT.

LEGEND
S-1 = GEOLOGIC FEATURE AS SHOWN IN GEOLOGIC ASSESSMENT
Kep = EDWARDS PERSON LIMESTONE

SILT FENCE

"TERRATEX SC" SILT FENCE OR EQUAL INSTALLED PER MANUFACTURER'S SPECIFICATIONS. MINIMUM FENCE HEIGHT IS 2'.

GENERAL NOTES:

① FENCE TO BE INSTALLED AND MAINTAINED UNTIL CONSTUCTION OF UTILITIES IS COMPLETE AND STREET BASE IS STABILIZED.

② B.M.P. CONTROLS TO BE INSTALLED AND MAINTAINED FOR CONSTRUCTION OF STRUCTURES UNTIL SITE IS 70 PERCENT REVEGETATED OR OTHERWISE STABILIZED.

GENERAL NOTES:

1. Stone size – 3 to 5 inch open graded rock
2. Length – as effective, but not less than 50 feet.
3. Thickness – not less than 8 inches.
4. Width – not less than full width of all points of ingress or egress.
5. Washing – when necessary, wheels shall be cleaned to remove sediment prior to entrance onto public roadway. When washing is required, it shall be done on an area stabilized with crushed stone which drains into an approved strap or sediment basin. All sediment shall be prevented from entering any storm, drain, ditch, or watercourse using approved methods.
6. Maintenance – the entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public roadways. This may require periodic dressing with additional stone as conditions demand, and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public roadway must be removed immediately.
7. Drainage – entrance must be properly graded or incorporate a drainage swale to prevent runoff from leaving the construction site.

STABILIZED CONSTRUCTION ENTRANCE

TCEQ-R13
JUN 08 2005
SAN ANTONIO

STORM WATER POLLUTION PREVENTION PLAN

NEW BRAUNFELS CHURCH OF CHRIST
HWY 46 & HWY 1863
NEW BRAUNFELS, TEXAS
Temporary Sedimentation & Erosion Control Plan

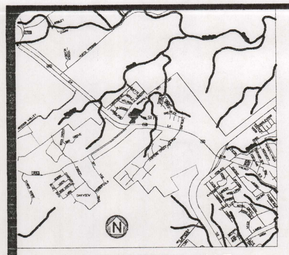
STATE OF TEXAS
MAX F. TERRY
68404
LICENSED PROFESSIONAL ENGINEER

JOHN LUCE
CIVIL ENGINEERING CONSULTANT
P.O. BOX 405
BULVERDE, TEXAS 78163
(830) 980-7878

REVISIONS:

DATE	BY
01/25/06	MFT
05/16/06	MFT

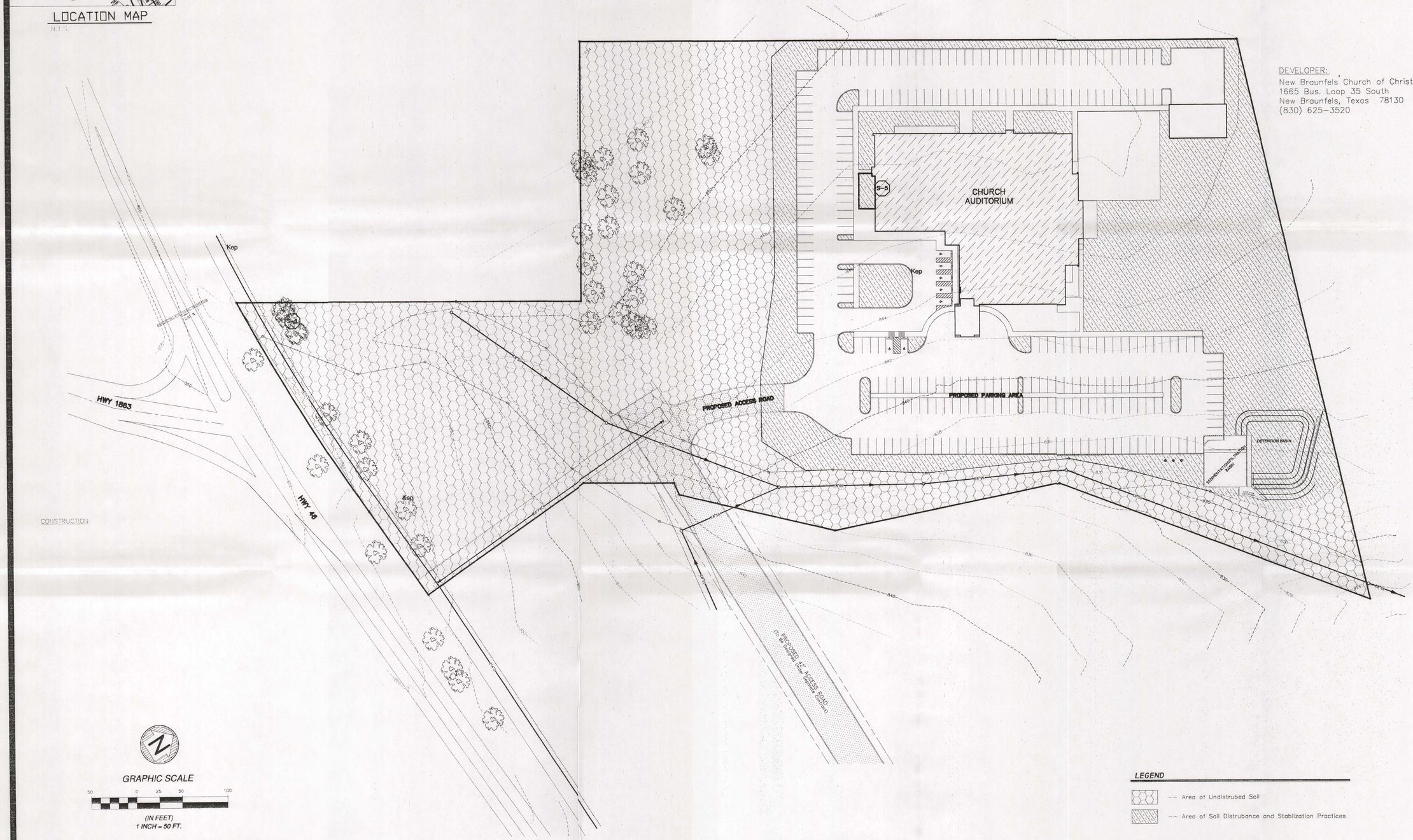
JOB NO. 05-1002
CLIENT:
DATE: 07/05/05
DESIGN: M.F.T.
DRAWN: M.F.T.
CHECKED:
SHEET 1 OF 1



LOCATION MAP

N.T.S.

TCEQ-R13
JUN 08 2006
SAN ANTONIO



DEVELOPER:
New Braunfels Church of Christ
1665 Bus. Loop 35 South
New Braunfels, Texas 78130
(830) 625-3520

SOIL DISTURBANCE AREAS

LEGEND

-- Area of Undistrubed Soil

-- Area of Soil Distrubance and Stablization Practices

NEW BRAUNFELS CHURCH OF CHRIST

Hwy 46 & Hwy 1863
New Braunfels, Texas

Temporary Sedimentation & Erosion Control Plan

STATE OF TEXAS
MAX F. TERRY
86404
LICENSED PROFESSIONAL ENGINEER
05/16/06

JOHN LUCE
CIVIL ENGINEERING CONSULTANT
P.O. BOX 405
BULVERDE, TEXAS 78163
(830) 980-7878

REVISIONS:

DATE	BY
01/25/06	MFT

JOB NO. 05-1002
CLIENT:
DATE: 07/05/05
DESIGN: M.F.T.
DRAWN: M.F.T.
CHECKED:
SHEET 1 OF 1

ATTACHMENT A

Spill Response Actions

Measures that will be taken to contain any spill of hydrocarbons or hazardous substances will include:

1. Immediate isolation of the substance source to keep additional spill or possible infiltration from occurring. 2-3 yards of clean sand shall be kept onsite to assist in the isolation and containment of the spill material.

2. The substance and contaminated materials will be excavated and placed within an impervious container or impervious-lined area that is protected from stormwater runoff. Excavated materials will be covered to protect against the rain.

3. The hazardous substances will be positively identified.

4. The spill area, after the excavation, will be sampled to verify that the hazardous substance has been properly and adequately remediated.

5. The excavated materials will be disposed of at an approved facility licensed to accept the substances identified. All transporting and disposal will follow State requirements for hazardous material.

6. TCEQ San Antonio Regional Office (210-490-3096) shall be notified immediately in the event that a spill occurs

ATTACHMENT B

Spill Response Actions

During construction of the infrastructure contamination could come from oil, grease and fuel drippings from construction equipment and also from the process of excavating materials and grading. If fuel or a hazardous substance spill occurs, the contaminated soil will be removed and placed in an impervious container and disposed of offsite at an approved disposal site. The placement of excavated materials will have appropriately sized erosion and sedimentation controls placed down gradient. Other potential sources of contamination which could originate on the project site would be from the construction of homes. Debris from the construction activity could be washed down gradient of the site. The construction site, of the individual home, will be cleaned of materials and debris at the end of each workday and/or at the completion of the house.

ATTACHMENT C

Sequences of Major Activities

1. Grubbing – The underbrush will be removed from the street and parking area (Disturbed area is approximately 2.9 acres)

2. Temporary BMPs – Silt fences and rock berm will be installed downgradient of any construction activity or as notated on the approved plans. Disturbed area is approximately 0.1 acres)

3. Excavation – the street and parking area will be cut to subgrade. (Disturbed area is approximately 2.9 acres)

4. Grading in the street and parking area. (Disturbed area is approximately 2.5 acres)

5. The construction of church building. (Disturbed area is approximately 1.2 acres)

6. The following utilities will be installed: sanitary sewer, water, electric, gas, telephone and cable television. (Disturbed area is approximately 0.9 acres)

7. The street, drainage and parking lot will be constructed. (Disturbed area is approximately 2.9 acres)

8. Permanent BMPs – Sedimentation will be installed at the location on the approved plans. (Disturbed area is approximately 0.1 acres)

Note: The excavated material from the trenches will be placed on the up-gradient side of the trench. The trench would serve as a temporary sedimentation and erosion control measure.

ATTACHMENT D

Temporary Best Management Practices and Measures

The Temporary Best Management Practices and Measures that will be used:

Silt Fences
Stabilized Construction Entrances
Rock Berm

All TBMP's will be installed prior to the beginning of construction as per the Storm Water Pollution Prevention Plan. The TBMP's will remain in place and will be maintained until all construction has ceased and perennial vegetative cover with a density of 70 percent has occured.

1. Install stabilized construction entrance, rock berm and silt fences.
2. Grubbing
3. Excavation
4. Saw for Utilities
5. Grading
6. Utility installation (sanitary sewer, water, electric, gas, telephone, cable television)
7. Street and Drain construction
8. 70 percent vegetative cover has been obtained
9. Remove TBMP's

The temporary measures to be used during construction to prevent pollution of surface water, groundwater, and stormwater runoff will be the use of the utility trenches to prevent the excavation from flowing down gradient in addition to the use of silt fencing and rock berm, as necessary, along the down gradient side of the subdivision as indicated in the Water Pollution Abatement Plan.

ATTACHMENT E

Request to Temporarily Seal a Feature

Not Applicable

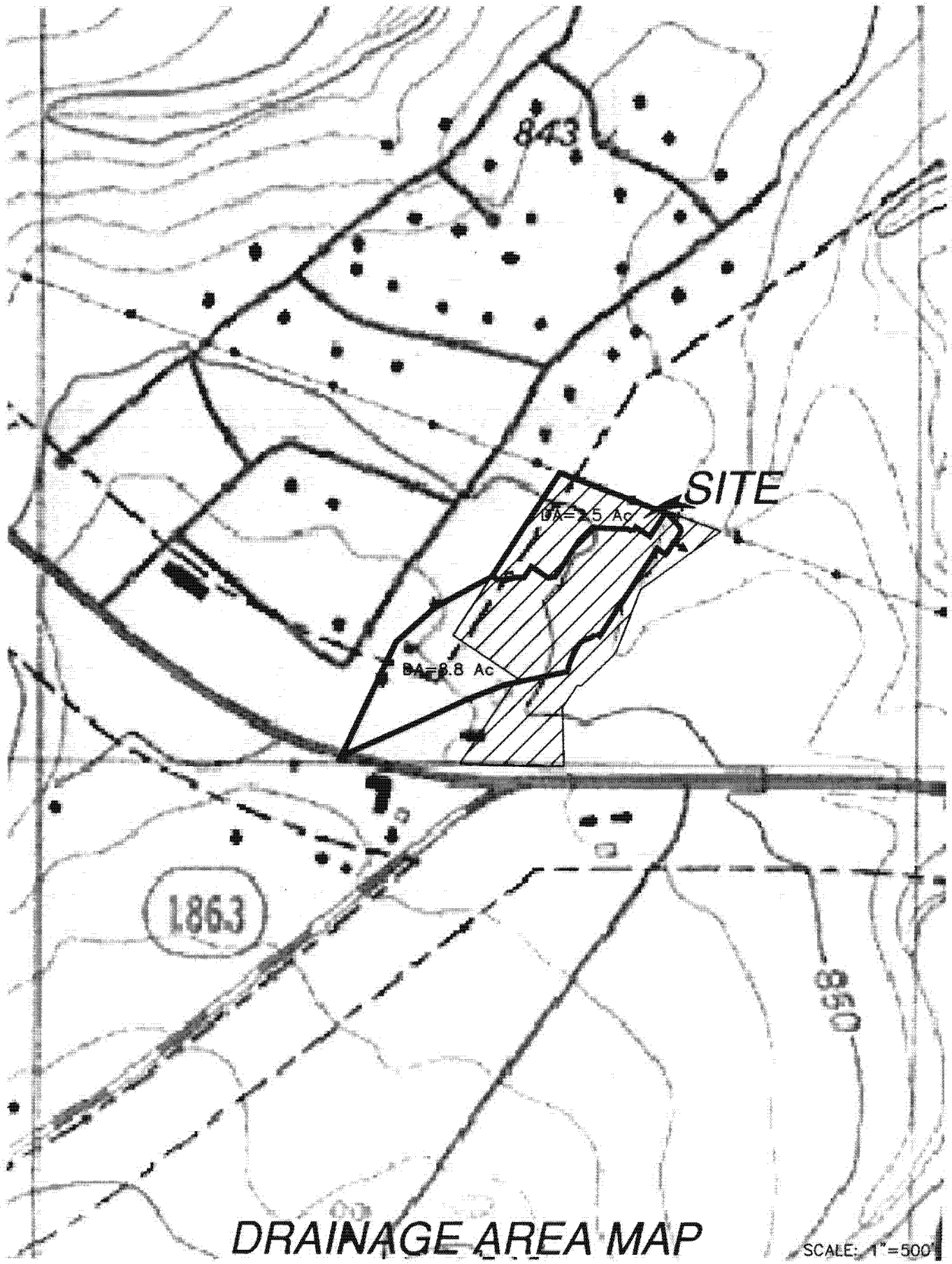
ATTACHMENT F

Structural Practices

The structural practices proposed that will limit runoff discharge of pollutants from exposed areas of the site will be the use of the sewer and water trenches, silt fences, rock berms and stabilized construction entrances to prevent the excavated material from washing across the site.

ATTACHMENT G

Drainage Area Map



DRAINAGE AREA MAP

SCALE: 1"=500'

ATTACHMENT H

Temporary Sedimentation Pond(s) Plans and Calculations

Not applicable

ATTACHMENT I

Inspection and Maintenance for BMPs

The BMPs for the construction of this project will be the use of silt fencing, stabilized construction entrances, rock berms and the sewer and water trenches. The following inspection and maintenance procedures will be implemented:

1. Silt fencing, rock berms and construction entrances must be in place prior to the start of construction and will remain in place until construction has been completed and the site stabilized from further erosion.

2. The contractor will inspect the silt fencing and construction entrances at least once every fourteen days and withing 24 hours of a storm event with 0.5 inches or more rainfall. The contractor will repair or replace any damaged TBMP's. The contractor should correct damage of deficiencies as soon as practical following the inspection, but no later that 7 days after the inspection.

3. Contractor will place trench excavation on the upgradient side of the trench.

4. All soil, sand, gravel, and excavated material stockpiled on-site will have appropriately sized silt fencing placed upgradient and downgradient.

5. The contractor will keep a record of the inspections, noting the condition of the silt fencing, construction entrances, rock berms and any corrective action taken to maintain the erosion control structures. In addition to the inspection and maintenance reports, the operator should keep records of the construction activity on site. In particular the following information should be kept:
    A. The dates when major grading activities occur in a particular area.
    B. The dates when construction activity ceases in an area, temporarily or permanently.
    C. The dates when an area is stabilized, temporarily or permanently.

ATTACHMENT J

Schedule of Interim and Permanent Soil Stabilization Practices

Stabilization measures shall be initiated as soon as a practicable in portions of the site where construction activities have temporarily on permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

Stabilization measure that will be used for the interim and permanent soil stabilization practices will consist of hydro mulch in the areas of soil disturbance.

Permanent Stormwater Section

Permanent Stormwater Section

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

REGULATED ENTITY NAME:

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

1. ✓ Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.

2. ✓ These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.

   ✓ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

   — A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is provided below

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

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

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

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

   ✓ This site will not be used for low density single-family residential development.

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

__ **ATTACHMENT A - 20% or Less Impervious Cover Waiver.** This site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is found at the end of this form.

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

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

6. **ATTACHMENT B - BMPs for Upgradient Stormwater.**

__ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is identified as **ATTACHMENT B** at the end of this form.

__ If no surface water, groundwater or stormwater originates upgradient from the site and flows across the site, an explanation is provided as **ATTACHMENT B** at the end of this form.

✓ If permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, an explanation is provided as **ATTACHMENT B** at the end of this form .

7. **ATTACHMENT C - BMPs for On-site Stormwater.**

✓ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is identified as **ATTACHMENT C** at the end of this form.

__ If permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, an explanation is provided as **ATTACHMENT C** at the end of this form.

8. ✓ **ATTACHMENT D - BMPs for Surface Streams.** A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is provided at the end of this form. Each feature identified in the Geologic Assessment as "sensitive" or "possibly sensitive" has been addressed.

9. ✓ The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.

✓ The permanent sealing of or diversion of flow from a naturally-occurring "sensitive" or "possibly sensitive" feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed for any naturally-occurring "sensitive" or "possibly sensitive" features on this site.

__ **ATTACHMENT E - Request to Seal Features.** A request to seal a naturally-occurring "sensitive" or "possibly sensitive" feature, that includes a justification as to why no reasonable and practicable alternative exists, is found at the end of this form. A request and justification has been provided for each feature.

10. ✓ **ATTACHMENT F - Construction Plans.** Construction plans and design calculations for the proposed permanent BMPs and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information have been signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed permanent BMPs and measures are provided at the end of this form. Design Calculations, TCEQ Construction Notes, all man-made or naturally occurring geologic features, all proposed structural measures, and appropriate details must be shown on the construction plans.

11. ✓ **ATTACHMENT G - Inspection, Maintenance, Repair and Retrofit Plan.** A plan for the inspection, maintenance, repair, and, if necessary, retrofit of the permanent BMPs and measures is provided at the end of this form. The plan has been prepared and certified by the engineer designing the permanent BMPs and measures. The plan has been signed by the owner or responsible party. The plan includes procedures for documenting inspections, maintenance, repairs, and, if necessary, retrofits as well as a discussion of record keeping procedures.

12. ✓ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

— Pilot-scale field testing (including water quality monitoring) may be required for BMPs that are not contained in technical guidance recognized by or prepared by the executive director.

— **ATTACHMENT H - Pilot-Scale Field Testing Plan.** A plan for pilot-scale field testing is provided at the end of this form.

13. ✓ **ATTACHMENT I -Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is provided at the end of this form. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity which increase erosion that results in water quality degradation.

Responsibility for maintenance of permanent BMPs and measures after construction is complete.

14. ✓ The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.

15. ✓ A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.

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

Max F. Terry
Print Name of Customer/Agent

Max F. Terry
Signature of Customer/Agent

01/25/06
Date

ATTACHMENT A

Not Applicable

ATTACHMENT B

BMPs for Upgradient Stormwater

Stormwater runoff from approximately 3 acres upstream of the development flows into the project site through an exist swale. The swale traverses this site but just east of the developed area. The off-site runoff remains in the swale and does not cross the development.

ATTACHMENT C

BMPs for On-site Stormwater

Stormwater from the development will be treated by a sedimentation/filtration basin. The basin has been sized to treat the entire pavement/building areas within the project site. However, the entrance road will not be able to be directed to the basin do to geographical limitations but it's area has been included in the sizing of the basin.

ATTACHMENT D

BMPs for Surface Streams

The sedimentation/filtration basin was designed to remove 80% of the increased Total Suspended Solids (TSS) for the entire site in accordance with the TCEQ Technical Guidance Manual (1999) to comply with 30 TAC Chapter 213 requirements.

ATTACHMENT E

Not Applicable

ATTACHMENT F

Construction Plans

5-YEAR STORM EVENT

DA = 8.789 acres

Impervious Cover:

Exist.	0	acres	=	0.0%
Prop.	2.462	acres	=	28.0%

Weight Runoff Coefficient "C":

Ce = (A1*C1)/At
= (8.789*0.38)/8.789
= *0.380*

Cp = (A1*C1+A2*C2)/At
= (6.327*0.38+2.462*0.83)/8.789
= *0.506*

Time of Concentration:

Te = 20 mins + 800 lf / (6*60) = *22.2* mins
Tp = 20 mins + 450 lf / (6*60) = *21.8* mins

Peak Discharge Rates:

$Q_e = KC_eI_eA$

K = 1.00
C_e = 0.380
$I_5=b/(T_c+d)^e$ = 4.41 in/hr
b = 72.9
d = 11.14
e = 0.800

Q_e = 14.7 cfs

$Q_p = KC_pI_pA$

K = 1.00
C_e = 0.506
$I_5=b/(T_c+d)^e$ = 4.45 in/hr
b = 72.9
d = 11.14
e = 0.800

Q_p = 19.8 cfs

10-YEAR STORM EVENT

DA = 8.789 acres

Impervious Cover:

Exist.	0	acres	=	0.0%
Prop.	2.462	acres	=	28.0%

Weight Runoff Coefficient "C":

Ce = (A1*C1)/At
= (8.789*0.38)/8.789
= *0.380*

Cp = (A1*C1+A2*C2)/At
= (6.327*0.38+2.462*0.83)/8.789
= *0.506*

Time of Concentration:

Te = 20 mins + 800 lf / (6*60) = *22.2* mins
Tp = 20 mins + 450 lf / (6*60) = *21.8* mins

Peak Discharge Rates:

$Q_e = KC_eI_eA$

K = 1.00
C_e = 0.380
$I_{100}=b/(T_c+d)^e$ = 5.14 in/hr
b = 71.9
d = 8.69
e = 0.769

Q_e = 17.2 cfs

$Q_p = KC_pI_pA$

K = 1.00
C_e = 0.506
$I_{100}=b/(T_c+d)^e$ = 5.19 in/hr
b = 71.9
d = 8.69
e = 0.769

Q_p = 23.1 cfs

25-YEAR STORM EVENT

DA = 8.789 acres

Impervious Cover:

Exist.	0 acres	=	0.0%
Prop.	2.462 acres	=	28.0%

Weight Runoff Coefficient "C":

Ce = (A1*C1)/At
= (8.789*0.38)/8.789
= *0.380*

Cp = (A1*C1+A2*C2)/At
= (6.327*0.38+2.462*0.83)/8.789
= *0.506*

Time of Concentration:

Te = 20 mins + 800 lf / (6*60) = *22.2* mins
Tp = 20 mins + 450 lf / (6*60) = *21.8* mins

Peak Discharge Rates:

$Q_e = KC_eI_eA$

K = 1.10
C_e = 0.380
$I_{100}=b/(T_c+d)^e$ = 6.15 in/hr
b = 79.5
d = 8.01
e = 0.751

Q_e = 22.6 cfs

$Q_p = KC_pI_pA$

K = 1.10
C_e = 0.506
$I_{100}=b/(T_c+d)^e$ = 6.21 in/hr
b = 79.5
d = 8.01
e = 0.751

Q_p = 30.4 cfs

100-YEAR STORM EVENT

DA = 8.789 acres

Impervious Cover:

Exist.	0	acres	= 0.0%
Prop.	2.462	acres	= 28.0%

Weight Runoff Coefficient "C":

Ce = (A1*C1)/At
= (8.789*0.38)/8.789
= *0.380*

Cp = (A1*C1+A2*C2)/At
= (6.327*0.38+2.462*0.83)/8.789
= *0.506*

Time of Concentration:

Te = 20 mins + 800 lf / (6*60) = *22.2* mins
Tp = 20 mins + 450 lf / (6*60) = *21.8* mins

Peak Discharge Rates:

$Q_e = KC_eI_eA$

K = 1.25
C_e = 0.380
$I_{100}=b/(T_c+d)^e$ = 8.04 in/hr
b = 95.1
d = 7.17
e = 0.731

Q_e = 33.6 cfs

$Q_p = KC_pI_pA$

K = 1.25
C_e = 0.506
$I_{100}=b/(T_c+d)^e$ = 8.12 in/hr
b = 95.1
d = 7.17
e = 0.731

Q_p = 45.1 cfs

INLET INTO BASIN

THE DEPTH OF FLOW AT THE CURB OPENING INLET IS SUCH AS TO FULLY SUBMERGE THE OPENING; THEREFORE, AN ORIFICE EFFECT WILL DEVELOP. IN ACCORDANCE WITH SEC. 35-A504, DIVISION 5, EXHIBIT A OF THE CITY OF SAN ANTONIO UNIFIED DEVELOPMENT CODE, THE CAPACITY OF THE CURB OPENING INLET IS:

$$Q = CA\ (2gh)^{1/2}$$

WHERE, Q = DISCHARGE IN CUBIC FEET PER SECOND
C = ORIFICE COEFFICIENT (TAKEN AS 0.70)
g = THE ACCELERATION DUE TO GRAVITY (32.2 ft/sec^2)
h = HEAD IN FEET
A = NET AREA OF OPENING IN SQUARE FEET

THEREFORE, GIVEN A FLOW OF 30.4 CFS AND A 6 $^{17}/_{64}$" HEAD (TYP.);

$$30.4 = 0.70A\ ((2)(32.2)(6.265625/12))^{1/2}$$

$$A = 7.41 \text{ sq. ft.}$$

WHERE HEIGHT OF OPENING IS 6 $^{1}/_{4}$" (TYP.), THE WIDTH OF OPENING REQUIRED IS 14.22 LINEAR FEET.

DESIGN ~ 15' INLET
(ACTUAL OPENING WIDTH)

OVERFLOW TO DETENTION BASIN

WEIR OPENING

$$L = \frac{Q}{Ch^{3/2}}$$

WHERE, L = LENGTH OF DROP CURB OPENING REQUIRED IN FEET
Q = DISCHARGE IN CUBIC FEET PER SECOND
C = 3.087
h = HEAD OF WEIR IN FEET = 0.58

THEREFORE, GIVEN A FLOW OF 1 30.4

$$L = \frac{30.4}{(3.087)(0.79)^{3/2}}$$

$$L = 22.29 \text{ ft}$$

DESIGN ~ 23' WEIR LENGTH

Texas Commission on Environmental Quality

TSS Removal Calculations

Project: ***New Braunfels Church of Christ***
Date Prepared: 1/1/2005

1. Required Load Reduction:

$L_M = 27.2(A_N \times P)$

where:

L_M = Required TSS removal
A_N = Net increase in impervious area for site
P = Average annual precipitation, inches

Site Data:		
County =	comal	
Total site area =	8.79	acres
Predevelopment impervious area =	0.00	acres
Post-development impervious area =	2.46	acres
Postdevelopment impervious fraction	0.28	
P =	33	inches

L_M = **2209.891** lbs.

2. Select BMP

Proposed BMP =	sf	abbreviation
Removal efficiency =	89	percent

AC	Aqualogic Cartridge Filter
BR	Bioretention
CW	Constructed Wetland
RI	Retention / Irrigation
SF	Sand Filter
WB	Wet Basin

3. Calculate TSS Load Removed by BMPs

$L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

L_R = TSS Load removed by BMP
A_I = Impervious area of BMP catchment
A_P = Pervious area of BMP catchment

A_I =	2.46	acres
A_P =	6.33	acres
L_R =	2602.23	lbs

4. Calculate Fraction of Annual to Treat

F = **0.85**

5. Calculate Capture Volume

Rainfall Depth =	1.32	inches
Post Development Runoff Coefficient =	0.25	
Runoff Volume =	10435	cubic feet
Storage for Sediment=	2087	
Total Capture Volume	12522	cubic feet

VEGETATED FILTER STRIP CALCULATIONS

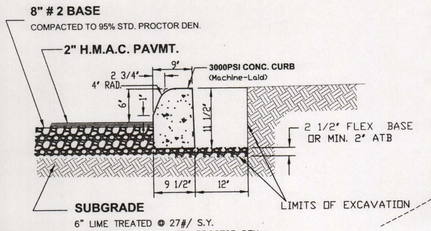
Vegetated filter strip shall produce a minimum loading rate of 4.6 ft^3/ft^2.

4.6 ft^3/ft^2 = annual rainfall x 1/12 x area being trated / vegetated filterstrip required.
Average Rainfall (Comal) = 33 in/yr
Impervious Cover = 39.9%
Area to be Treated = 0.91 Ac.

Vegetated filter stip = ((33 x 1/12 x 0.91)/4.6)
= 0.54 Ac.

Area = Length x Width
Width = 150 ft
Length = 157 ft > 12 ft therefore OK

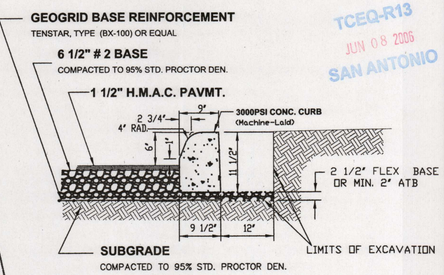
ALTERNATE 2



TYPICAL PAVEMENT SECTION

N.T.S.

ALTERNATE 1



TYPICAL PAVEMENT SECTION

N.T.S.

TCEQ-R13
JUN 08 2006
SAN ANTONIO

NOTE:
UNLESS OTHERWISE NOTED, THE TOP OF CURB ELEV. IS 6" ABOVE THE TOP OF PAVEMENT.

LEGEND

42.78C INDICATES TOP OF CURB
43.36P INDICATES TOP OF PAVEMENT

PARKING AREA QUANITIES

EXCLUDING PROPOSED ACCESS ROAD

1. Pavement Area = 11,763 S.Y.
2. Machine Laid Curb = 2,239 L.F.
3. Header Curb = 62 L.F.
4. Retaining Wall = 115 L.F.
5. Sodded Slope = 700 S.Y.

DENSITY TEST FREQUENCY

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 INCH = 40 FT.

GENERAL SPECIFICATIONS FOR SITE PREPARTION

GENERAL DESCRIPTION

This item shall consist of all clearing and grubbing, demolition, preparation of land to be filled, filling of the land, spreading, compaction testing and inspection of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades and slopes as shown on the approved plans.

CLEARING THE AREA TO BE FILLED

All timber, logs, trees, brush and rubbish shall be removed from the site.

SCARIFYING THE AREA TO BE FILLED

All organic matter shall be removed from the surface upon which the fill is to be placed, and the surface shall then be disked or scarified to a minimum depth of six inches (6"), all surface ruts or other uneven features will be leveled prior to field density testing.

Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be disked or scarified. Where the slope ratio of the original ground is steeper than 5 horizontal to 1 vertical, the bank shall be stepped or benched. Ground slopes which are flatter than 5 to 1 shall be benched when considered necessary by the Geotechnical Engineer.

COMPACTING THE AREA TO BE FILLED

Following the clearing and disking or scarifying of the fill area, it shall be bladed until it is uniform and free from large clods. The area shall be brought to the adequate moisture content, and compacted (typically) to not less than ninety percent (90%) of maximum density in accordance with the current ASTM D 1557 Compaction Procedure, or 90% of maximum density in accordance with the current TxDOT Test Method TEX-113-E Compaction Procedure.

FILL MATERIALS

The materials used shall be free from organic matter and other deleterious substances, such as trees, brush and rubbish.

DENSITY TESTS

Field density tests shall be performed on layers of fill when the fill is being placed, as directed by the Geotechnical engineer. The maximum fill height between density testing shall be eighteen inches (18"). All testing shall be requested by the contractor to meet the contractor's construction schedule. Notification by the contractor to conduct tests shall be at least the day before. This notification shall include the fill area location (Lot and Block), the lift or height of fill and approximate desired time of testing. When these tests indicate that the density of any layer of fill or portion thereof is below the required density, the portion or layer shall be reworked or replaced and retested at the expense of the contractor unless the contractor can show evidence that circumstances beyond his control required the retesting. Generally, the specific testing will be as follows and conducted by the Geotechnical Engineer.

1. The land to be filled (prepared subgrade) shall be prepared and tested at a frequency as determined by the geotechnical engineer.
2. The first lift of compacted fill (generally 6 to 12-in.) shall be tested as determined by the geotechnical engineer. Any areas supporting the proposed structures requiring fill shall be tested for density.
3. Fills shall be tested a maximum of each eighteen inches (18") of fill.
4. Test results will be provided by the field technician to the contractor when possible; however, all test results are to be reviewed by the geotechnical engineer for compliance. The engineer will notify the contractor of all test results.

DEPTH AND MIXING OF FILL LAYERS

he selected fill material shall be placed in level, uniform layers which, when mpacted, shall have a density conforming to that stipulated above. Each layer hall be thoroughly mixed during the spreading to ensure uniformity of material e each layer. Compacted layer thickness may vary depending on the compaction quipment of demonstrated capability. The maximum loose depth for any material hall not exceed eight inches (8"). For testing requirements of fill material, e density testing.

ROCK

hen fill material includes rock, the maximum rock size shall be as approved by e Geotechnical Engineer. No large rocks shall be allowed to nest and all voids ust be filled with small stones or soil and adequately compacted. No large rocks ll be permitted within eighteen inches (18") of the finished grade.

MOISTURE CONTENT

e fill material shall be compacted at the appropriate moisture content specified r the soils being used. Appropriate moisture content is defined, typically, as timum moisture content; however, for expansive soils it may be greater than timum moisture content, and other moisture contents may be necessary to produce e desired results with certain soils.

AMOUNT OF COMPACTION

Following placing and spreading, the fill shall be compacted to the appropriate specified density which is acceptable to the Geotechnical Engineer. The specified density typically will be ninety percent (90%) of ASTM D 1557 Compaction Procedure or 90% of the maximum dry density by TxDOT Test Method TEX-113-E.

COMPACTION OF FILL LAYER

Compaction equipment shall be capable of compacting the fill to the specified density. Compaction shall be accomplished while the fill material is at or near the appropriate moisture content. Composition of each layer shall be continuous over the entire structural area (beneath proposed structures).

COMPACTION OF SLOPES

The faces of fill slopes shall be compacted. Compacting operations shall be continued until the slope faces are stable but not too dense for planting on the slopes. Compaction of the slope faces may be done progressively in horizontal of three to five feet (3' to 5') in fill height as the fill progresses or after the fill has been brought to its total height.

JOHN LUCE
CIVIL ENGINEERING CONSULTANT
P.O. BOX 405
BULVERDE, TEXAS 78163
(830) 980-7878

NEW BRAUNFELS CHURCH OF CHRIST
HWY 46 & HWY 1863
NEW BRAUNFELS, TEXAS

Grading Plan

STATE OF TEXAS — MAX F. TERRY — 86404 — LICENSED PROFESSIONAL ENGINEER

REVISIONS:

DATE	BY
12/03/05	J.B.L.
05/16/06	J.B.L.

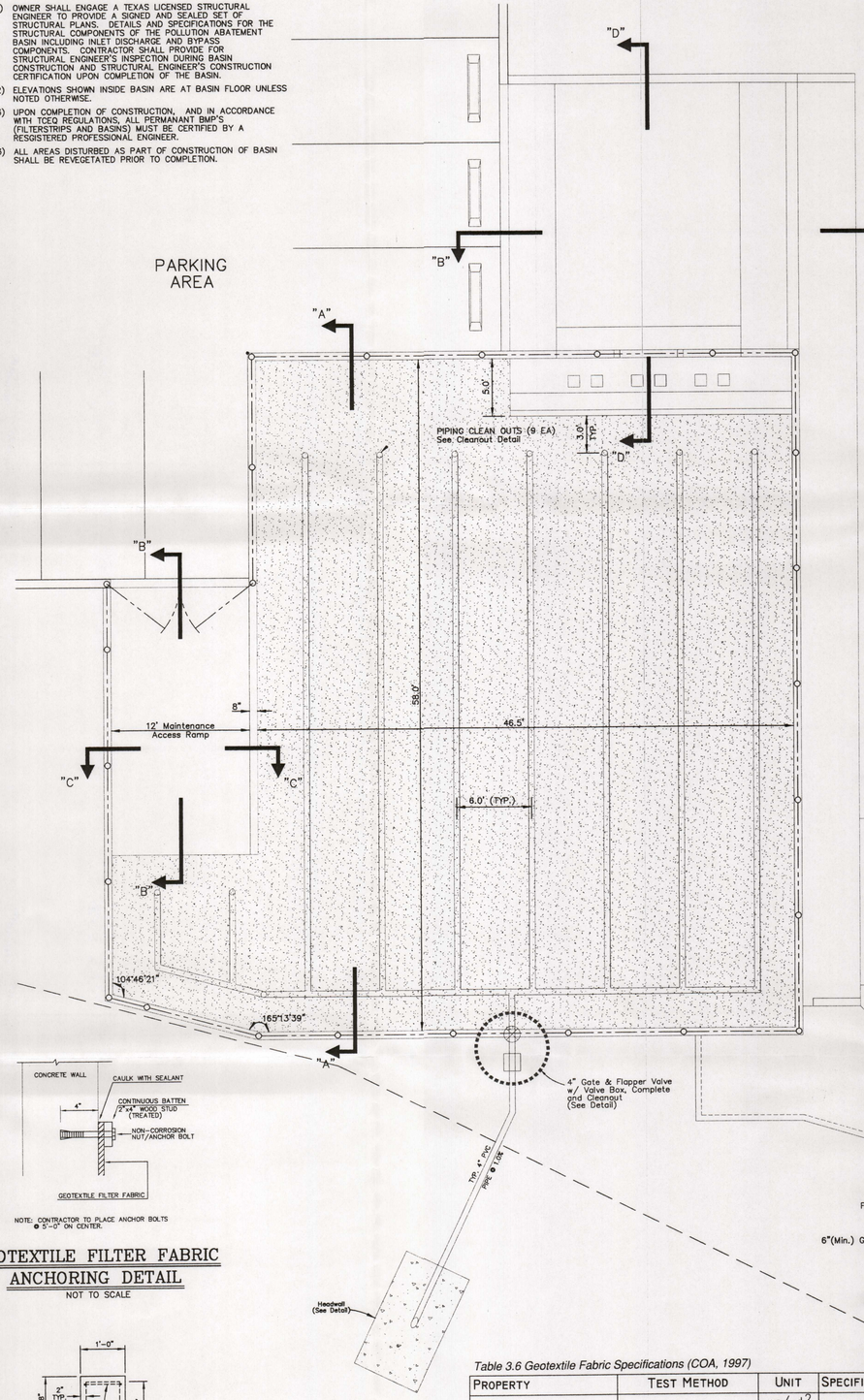
JOB NO. E - 10852405
CLIENT: TIMBERCON CONSTRUCTION
DATE: 11/23/05
DESIGN: M.F.T.
DRAWN: M.F.T.
CHECKED: J.B.L.
SHEET C 3

NOTES: 1) OWNER SHALL ENGAGE A TEXAS LICENSED STRUCTURAL ENGINEER TO PROVIDE A SIGNED AND SEALED SET OF STRUCTURAL PLANS, DETAILS AND SPECIFICATIONS FOR THE STRUCTURAL COMPONENTS OF THE POLLUTION ABATEMENT BASIN INCLUDING INLET DISCHARGE AND BYPASS COMPONENTS. CONTRACTOR SHALL PROVIDE FOR STRUCTURAL ENGINEER'S INSPECTION DURING BASIN CONSTRUCTION AND STRUCTURAL ENGINEER'S CONSTRUCTION CERTIFICATION UPON COMPLETION OF THE BASIN.

2) ELEVATIONS SHOWN INSIDE BASIN ARE AT BASIN FLOOR UNLESS NOTED OTHERWISE.

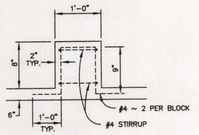
3) UPON COMPLETION OF CONSTRUCTION, AND IN ACCORDANCE WITH TCEQ REGULATIONS, ALL PERMANANT BMP'S (FILTERSTRIPS AND BASINS) MUST BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.

3) ALL AREAS DISTURBED AS PART OF CONSTRUCTION OF BASIN SHALL BE REVEGETATED PRIOR TO COMPLETION.

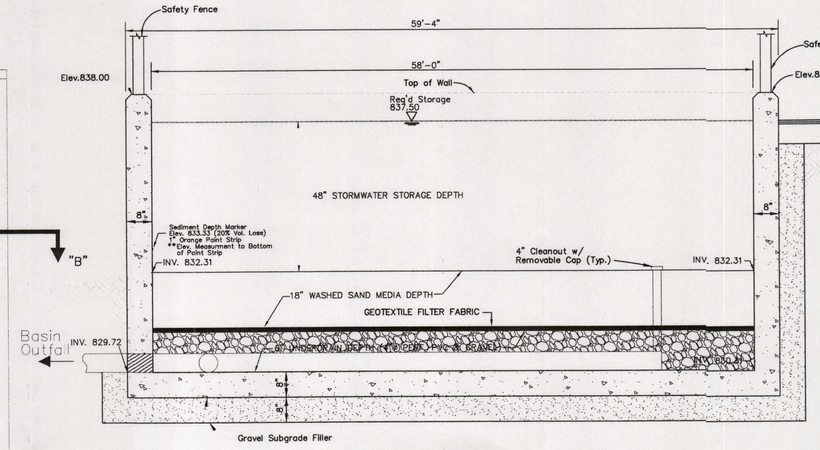


NOTE: CONTRACTOR TO PLACE ANCHOR BOLTS @ 5'-0" ON CENTER.

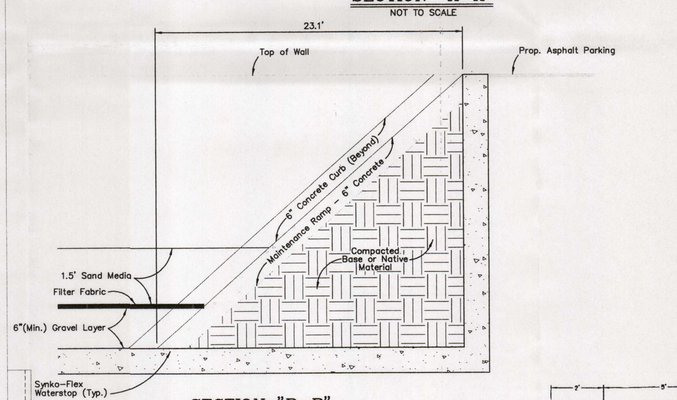
GEOTEXTILE FILTER FABRIC ANCHORING DETAIL
NOT TO SCALE



FLOOR BLOCK REINFORCEMENT
NTS



SECTION "A–A"
NOT TO SCALE



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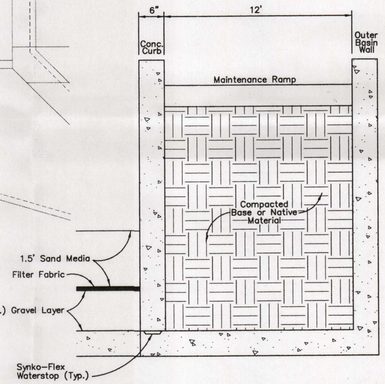


SECTION "C–C"
NOT TO SCALE

Table 3.6 Geotextile Fabric Specifications (COA, 1997)

PROPERTY	TEST METHOD	UNIT	SPECIFICATION (MIN)
Unit Weight		oz/yd^2	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D-1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

* modified

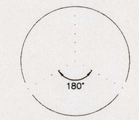
BASIN DESIGN DATA

BASIN AREA	=	8.789 ACRES
RUN OFF DEPTH	=	0.88 FT
REQUIRED CAPTURE VOLUME	=	12,522 CF
REQUIRED SAND AREA	=	1,342 SF
BASIN DEPTH	=	4.0 FT
BASIN CAPTURE VOLUME	=	14,024.4 CF
BASIN SAND AREA	=	2748 SF
OVERFLOW WEIR HEIGHT	=	0.58 FT X 23 FT
Q_{25}	=	30.4 CFS

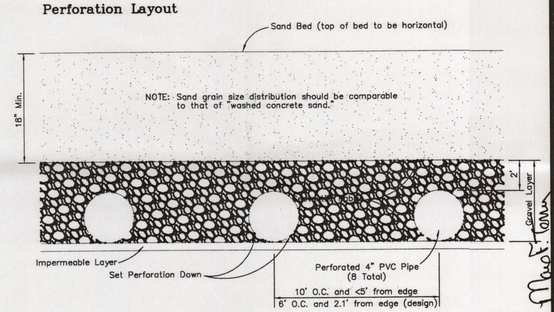
NOTE:
ACTUAL BASIN STORAGE VOLUME AND SAND SURFACE AREA EXCEEDS REQUIREMENTS.

SECTION "E–E"
NOT TO SCALE

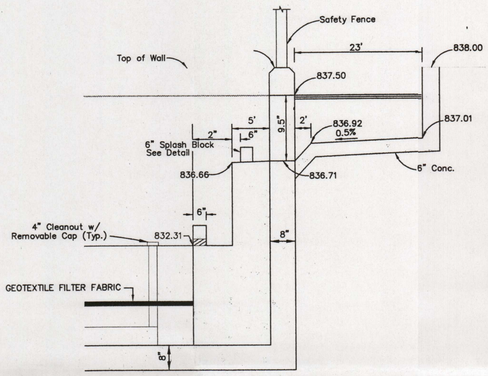
TCEQ-R13
JUN 08 2006
SAN ANTONIO



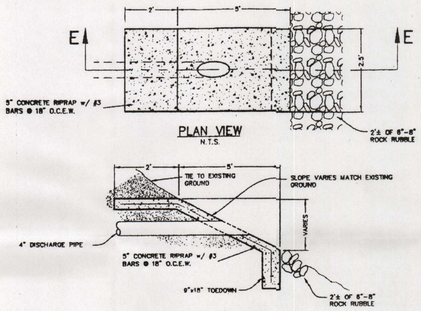
Perforation Layout



SAND BED PROFILE (with gravel filter)
NOT TO SCALE

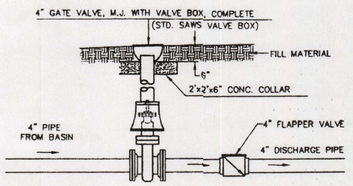


SECTION "D–D"
NOT TO SCALE



SECTION "E–E"
N.T.S.

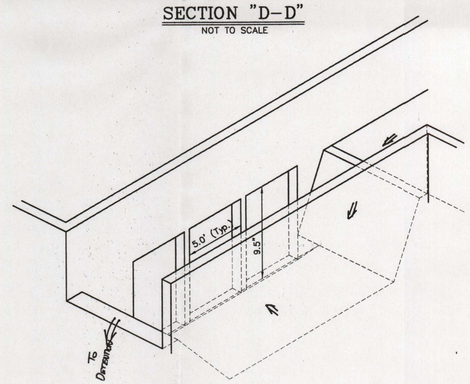
DISCHARGE HEADWALL DETAIL



4" GATE & FLAPPER VALVE DETAIL
N.T.S.

NOTE:

1. VALVE WILL BE SET PARTIALLY CLOSED SO AS TO PROVIDE A MINIMUM DRAWDOWN TIME OF 24 HOURS.
2. CONTRACTOR SHALL PROVIDE OWNER WITH VALVE OPERATING KEY/ROD PRIOR TO PROJECT COMPLETION.



ISOMETRIC VIEW OF INLET
NOT TO SCALE

NEW BRAUNFELS CHURCH OF CHRIST
HWY 46 & HWY 1863
NEW BRAUNFELS, TEXAS

Sedimentation/Filtration Basin

JOHN LUCE
CIVIL ENGINEERING CONSULTANT
P.O. BOX 405
BULVERDE, TEXAS 78163
(830) 980-7878

STATE OF TEXAS — MAX F. TERRY — 86404 — LICENSED PROFESSIONAL ENGINEER

REVISIONS:

DATE	BY
12/04/05	J.B.L.
05/16/06	M.F.T.

JOB NO. E-10852405
CLIENT: TIMBERCON CONSTRUCTION
DATE: 11/22/05
DESIGN: M.F.T.
DRAWN: M.F.T.
CHECKED: J.B.L.
SHEET C4

ATTACHMENT G

Inspection, Maintenance, Repair and Retrofit Plan

MAINTENANCE PROCEDURES FOR PERMANENT POLLUTION ABATEMENT MEASURES

1. Check Depth of Vegetation. Vegetation in the basin shall not exceed 18-inches in depth. When vegetation needs to be cut, it shall be cut to an approximately 4-inch height. *A written record should be kept of inspection results and maintenance performed.*
2. Check Depth of Silt Deposits in Basin. Silt accumulation can be checked by excavating holes in the corners of the basin and visually inspecting the excavated holes for the accumulation of silt. Silt accumulation can be visually inspected by observing changes in texture, particle size and/or color of the sidewalls of the excavated hole. When silt deposits exceeds 2 inches over the entire sand filter surface area, the silt shall be removed. When silt removal is necessary, the entire depth of silt shall be removed plus sand filter media to a depth equal to half the depth of silt accumulation (e.g. 3-inch of silt accumulation; remove 3-inch of silt plus 1.5 inches of sand). Sand filter media should be replaced with clean sand as specified in plans. *A written record should be kept of inspection results and maintenance performed.*
3. Removal of Debris and Trash. The basin and inlet structure shall be checked for the accumulation of debris and trash such as brush, limbs, leaves, paper clips, aluminum cans, plastic bottles, etc. Accumulated trash and debris shall be raked or collected from the basin and inlet structure and disposed of properly. *A written record should be kept of inspection results and maintenance performed.*
4. Cut-off Valve. The cut-off valve shall be turned to confirm full opening and full closure. Prior to operating the valve, the valve setting shall be checked to determine the position to which the valve is to be returned (which should limit drawdown time of basin between 24-hours and 48-hours). Count should be kept of number of turns to open and close the valve so that the valve can be reset to the starting position. Defects in the operation of the cut-off valve shall be corrected within 7 working days. *A written record should be kept of inspection results and maintenance performed.*
5. Inlet Splash Pad. The filter area around the inlet splash pad shall be checked for erosion and the condition of the rock rubble. Erosion or disturbance of the rock rubble should be corrected by removing the rock rubble, restoring missing sand media to appropriate depth and replacement of the rock rubble. If the condition persists in subsequent inspections, the size of the rock rubble should be increased. Rubble should be placed to a density that minimizes the amount of exposed sand between the rock rubble. Deficiencies should be corrected within seven working days. *A written record should be kept of inspection results and maintenance performed.*
6. Underdrain System. The underdrain system shall be visually inspected for the accumulation of silt in the pipe system. The pipe clean-outs shall have the caps removed and visually inspected for accumulation of silt deposits. If silt deposits appear to have accumulated so as to significantly reduce the drain capacity of the pipes then maintenance shall be performed. When silt deposits have accumulated to the stage described above, the clean-outs and drainpipes can be flushed with a high-pressure water flushing process. Clean-out caps must be replaced onto the clean-outs after maintenance so as to avoid the possibility of short circuiting the filtering process. Sediment accumulation at outlet pipe or in wet well due to flushing shall be removed and disposed of properly. *A written record should be kept of inspection results and maintenance performed.*
7. Structural Integrity. In addition to Items 1 through 6 the following are measures which should be reviewed during a check of structural integrity.
   - Observe the height of the confining berm for visible signs of erosion or potential breach. Signs of erosion should be corrected within 2 weeks or immediately in case of emergency conditions. Corrective measures include but are not limited to addition of topsoil or appropriate soil

material so as to restore the original berm height of the sand filter basin. Restored areas shall be protected through placement of block sod in a checkerboard pattern.

- Bypass of filter process. The condition can manifest itself in several ways. One way is to visually inspecting the clean-outs for accumulation of silt as described in Item 6. Significant accumulations of silt could be a sign of a torn filter fabric. Observations should be made over several inspection cycles to determine whether the condition persists. A second non-intrusive way of making observations for structural condition would be to visually look for collapsed or depressed areas along the edge of the filter media interface with basin side slope. Removal of sand and replacement of filter fabric and/or pipe and gravel may be necessary. *A written record should be kept of inspection results and maintenance performed.*

8. Discharge Pipe. The Basin discharge pipe shall be checked for accumulation of silt, debris or other obstructions which could block flow. Soil accumulations, vegetative overgrowth and other blockages should be cleared from the pipe discharge point. Erosion at the point of discharge shall be monitored. If erosion occurs, the addition of rock rubble to disperse the flow should be accomplished. *A written record should be kept of inspection results and maintenance performed.*
9. Drawdown Time. The characteristics can be a sign of the need for maintenance. The minimum drawdown time is 24 hours. If drawdown time is less then 24 hours, the gate valve shall be checked and partially closed to limit the drawdown time. Extensive drawdown time greater than 48 hours may indicate blockage of the sand media, the underdrain system and/or the discharge pipe. Corrective actions should be performed and completed within 15 working days. *A written record should be kept of inspection results and maintenance performed.*
10. Vegetated Filter Strips. Vegetation height for native grasses shall be limited to no more than 18-inches. When vegetation exceeds the height, the filter strip shall be cut to a height of approximately 4 inches. Turf grass shall be limited to a height of 4-inches with regular maintenance that utilizes a mulching mower. Trash and debris shall be removed from filter strip prior to cutting. Check filter strip for signs of concentrated flow and erosion. Areas of filter strip showing signs of erosion shall be repaired by scarifying the eroded area, reshaping, regrading and placement of block sod in a checkerboard pattern over the affected area. *A written record should be kept of inspection results and maintenance performed.*
11. Visually Inspect Security Fencing for Damage or Breach. Check maintenance access gates for proper operation. Damage to fencing or gates shall be repaired within 5 working days. *A written record should be kept of inspection results and maintenance performed.*

It should be noted that the timing and procedures presented herein are general guidelines, adjustment to the timing and procedures may have to be made depending on project specific characteristics as well as weather related conditions.

I understand that I am responsible for maintenance of the Permanent Pollution Abatement Measures included in this project until each such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property or ownership is transferred.

I, the owner, have read and understand the requirements of the attached Maintenance Plan and Schedule.

Brendan D. Eppler — July 25, 2005

Signature — Date

New Braunfels Church of Christ

INSPECITION AND MAINTENANCE SCHEDULE
FOR
PERMANENT POLLUTION ABATEMENT MEASURES

	After Rainfall	Monthly	Quarterly	Yearly
Check Depth of Vegetation	X	X	X	X
Check Depth of Silt Deposit in Basin			X	
Removal of Debris and Trash			X	
Cut-off Valve				X
Inlet Splash Pad			X	
Underdrain System				X
Structural Integrity				X
Discharge Pipe	X		X	
Drawdown Time	X			
Vegetated Filter Strips		X		
Visually inspect Security Fencing for Dama	X	X	X	X

ATTACHMENT H

Not Applicable

ATTACHMENT I

Measures for Minimizing Surface Stream Contamination

Any point where discharge from the site is concentrated and excessive velocities exist will include appropriately sized energy dissipators to reduce velocities to non-erosive levels.

Agent Authorization Form

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

I, **GLENDON EPPLER**
Print Name

CHURCH REPRESENTATIVE
Title - Owner/President/Other

of **NEW BRAUNFELS CHURCH OF CHRIST**
Corporation/Partnership/Entity Name

have authorized **Max F. Terry, P.E.**
Print Name of Agent/Engineer

of **John Luce Consulting Engineers**
Print Name of Firm

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

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For applicants who are not the property owner, but who have the right to control and possess the property, addition authorization required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the Person preparing the application, and this form must accompany the completed application.

Glendon D. Eppler — Applicant's Signature

6-30-2005 — Date

THE STATE OF TEXAS §
County of COMAL §

BEFORE ME, the undersigned authority, on this day personally appeared GLENDON D EPPLER 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 30th day of JUNE, 2005.

DEBORA M. COOK
MY COMMISSION EXPIRES
JULY 16, 2005

Debora M. Cook
NOTARY PUBLIC

DEBORA M Cook
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: JULY 16, 2005

Application Fee Form

Texas Commission on Environmental Quality
Edwards Aquifer Protection Plan
Application Fee Form

NAME OF PROPOSED REGULATED ENTITY: **New Braunfels Church of Christ**
REGULATED ENTITY LOCATION: **Hwy 46 & Hwy 1863**
NAME OF CUSTOMER: **New Braunfels Church of Christ**
CONTACT PERSON: **Glendon Eppler** PHONE: **(830) 980-7842**
(Please Print)

Customer Reference Number (if issued): CN _____ (nine digits)
Regulated Entity Reference Number (if issued): RN _____ (nine digits)

AUSTIN REGIONAL OFFICE (3373)
☐ Hays
☐ Travis
☐ Williamson

SAN ANTONIO REGIONAL OFFICE (3362)
☐ Bexar
☑ Comal
☐ Kinney
☐ Medina
☐ Uvalde

APPLICATION FEES MUST BE PAID BY CHECK, CERTIFIED CHECK, OR MONEY ORDER, PAYABLE TO THE Texas Commission on Environmental Quality. YOUR CANCELED CHECK WILL SERVE AS YOUR RECEIPT. **THIS FORM MUST BE SUBMITTED WITH YOUR FEE PAYMENT.** THIS PAYMENT IS BEING SUBMITTED TO (CHECK ONE):

☑ **SAN ANTONIO REGIONAL OFFICE**
☐ **Mailed to TCEQ:**
TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

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

Type of Plan	Size		Fee Due
Water Pollution Abatement, One Single Family Residential Dwelling		Acres	$
Water Pollution Abatement, Multiple Single Family Residential and Parks		Acres	$
Water Pollution Abatement, Non-residential	11.306	Acres	$ 5,000.00
Sewage Collection System		L.F.	$
Lift Stations without sewer lines		Acres	$
Underground or Aboveground Storage Tank Facility		Tanks	$
Piping System(s)(only)		Each	$
Exception		Each	$
Extension of Time		Each	$

Mark F. Terry, P.E.
Signature

07/05/05
Date

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Application Fee Schedule
30 TAC §213.14 (effective 11/14/97) & 30 TAC §213.9 (effective 6/1/99)

Water Pollution Abatement Plans and Modifications

PROJECT	PROJECT AREA IN ACRES	FEE
One Single Family Residential Dwelling	<5	$500
Multiple Single Family Residential and Parks	<5 5 < 10 10 < 50 ≥50	$1,000 $2,000 $3,000 $5,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 ≥10	$2,000 $3,000 $4,000 $5,000

Organized Sewage Collection Systems and Modifications

PROJECT	COST PER LINEAR FOOT	MINIMUM FEE MAXIMUM FEE
Sewage Collection Systems	$0.50	$500 - $5,000

Underground and Aboveground Storage Tank System Facility Plans and Modifications

PROJECT	COST PER TANK OR PIPING SYSTEM	MINIMUM FEE MAXIMUM FEE
Underground and Aboveground Storage Tank Facility	$500	$500 - $5,000

Exception Requests

PROJECT	FEE
Exception Request	$250

Extension of Time Requests

PROJECT	FEE
Extension of Time Request	$100

LOCATION MAP

DEVELOPER:
New Braunfels Church of Christ
1665 Bus. Loop 35 South
New Braunfels, Texas 78130
(830) 625-3520

CHURCH AUDITORIUM

PROPOSED PARKING AREA

PROPOSED ACCESS ROAD

(To a Proposed Rear Access Road)

HWY 1863

HWY 46

Kep

S-5

SOIL DISTURBANCE AREAS

GRAPHIC SCALE
50 0 25 50 100
(IN FEET)
1 INCH = 50 FT.

LEGEND
--- Area of Undistrubed Soil
--- Area of Soil Distrubance and Stablization Practices

RECEIVED
JUL 14 2006
COUNTY ENGINEER

TCEQ-R13
JUL 10 2006
SAN ANTONIO

NEW BRAUNFELS CHURCH OF CHRIST
HWY 46 & HWY 1863
NEW BRAUNFELS, TEXAS

Temporary Sedimentation & Erosion Control Plan

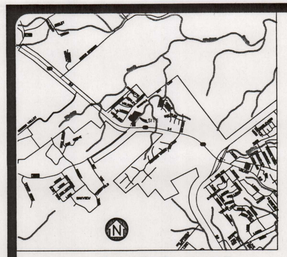
JOHN LUCE
CIVIL ENGINEERING CONSULTANT
P.O. BOX 405
BULVERDE, TEXAS 78163
(830) 980-7878

MAY F. TERRY 86404 LICENSED PROFESSIONAL ENGINEER

REVISIONS:

DATE	BY
01/25/06	MFT
7/7/06	JBL

JOB NO. 05-1002
CLIENT:
DATE: 07/05/05
DESIGN: M.F.T.
DRAWN: M.F.T.
CHECKED:
SHEET 1 OF 1



LOCATION MAP
N.T.S.

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
WATER POLLUTION ABATEMENT PLAN
GENERAL CONSTRUCTION NOTES

1. Written construction notification must be given to the appropriate TCEQ regional office no later that 48 hours prior to commencement of the regulate activity. Information must included the date on which the regulated activity will commence, the name of the approved plan for the regulated activity,and the name of the prime contractor and the name and telephone number of the contact person.

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approved letter.

3. If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive features may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.

4. 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

5. All temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.

6. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

7. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.

8. Litter, construction debris, and construciton chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity is that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

11. The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.

12. The holder of any approved Edward Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;

B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;

C. any development or land previously identified as undeveloped in the original water pollution abatement plan.

NOTES:

1. The construction activities associated with this project must meet all applicable criteria of the Texas Natural Resource Conservation Commission set forth in 30 Texas Administrative Code (TAC) 213.5(b) – Water Pollution Abatement Plan for Regulated Activities undertaken on the recharge zone of the Edwards Aquifer.

2. Temporary erosion and sedimentation controls are required during construction. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized. The temporary erosion and sedimentation controls must be inspected periodically for damage caused by construction activities and following every rainfall. Damaged or obstructed controls must be repaired or replaced as necessary to maintain proper operation.

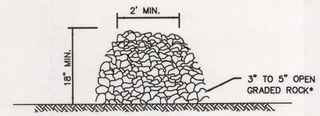
3. If any sensitive feature is discovered during construction, regulated activities near the sensitive feature must be suspended immediately. The owner must immediately notify the appropriate regional office of the Texas Natural Resource Conservation Commission of the sensitive feature discovered. The regulated activities near the sensitive feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

4. Any modification to the approved Water Pollution Abatement Plan must be submitted to the appropriate regional office for approval by the executive director of the Texas Natural Resource Conservation Commission before construction of the proposed modification may commence.

5. All contractors conducting regulated activities associated with this project must be provided with copies of the approved Water Pollution Abatement Plan and the TNRCC letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approved letter.

INSTALLATION

- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- THE ROCK BERM SHALL BE REMOVED WHEN THE SITE IS 75 PERCENT REVEGETATED OR OTHERWISE STABILIZED.



CROSS-SECTION

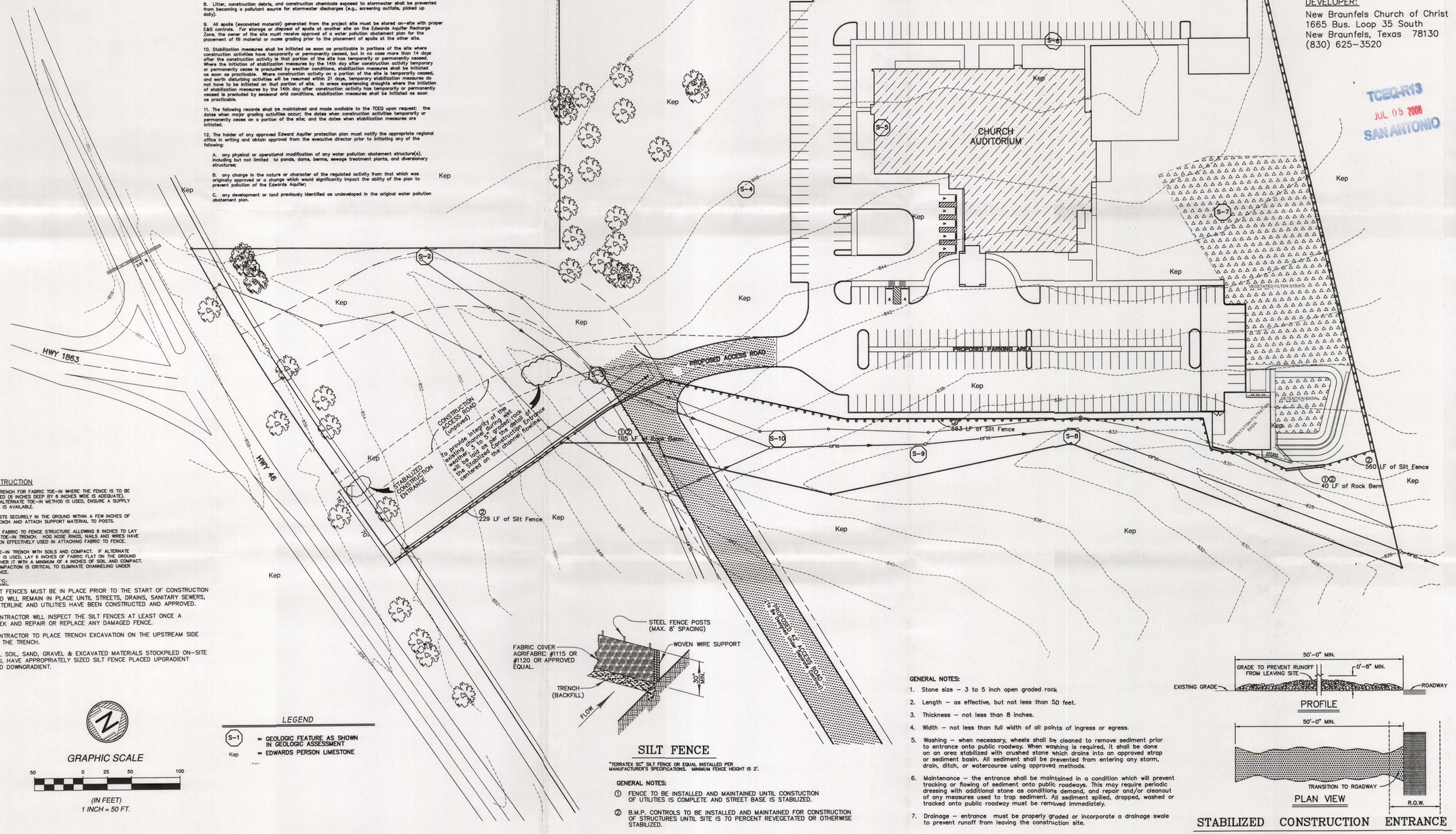
ROCK BERM

NTS

RECEIVED
JUL 14 2006
COUNTY ENGINEER

DEVELOPER:
New Braunfels Church of Christ
1665 Bus. Loop 35 South
New Braunfels, Texas 78130
(830) 625-3520

TCEQ-R13
JUL 05 2006
SAN ANTONIO



CONSTRUCTION

DIG A TRENCH FOR FABRIC TOE-IN WHERE THE FENCE IS TO BE INSTALLED (6 INCHES DEEP BY 6 INCHES WIDE IS ADEQUATE). IF THE ALTERNATE TOE-IN METHOD IS USED, ENSURE A SUPPLY OF SOIL IS AVAILABLE.

SET POSTS SECURELY IN THE GROUND WITHIN A FEW INCHES OF THE TRENCH AND ATTACH SUPPORT MATERIAL TO POSTS.

ATTACH FABRIC TO FENCE STRUCTURE ALLOWING 6 INCHES TO LAY IN THE TOE-IN TRENCH. HOG NOSE RINGS, NAILS AND WIRES HAVE ALL BEEN EFFECTIVELY USED IN ATTACHING FABRIC TO FENCE.

FILL TOE-IN TRENCH WITH SOILS AND COMPACT. IF ALTERNATE METHOD IS USED, LAY 6 INCHES OF FABRIC FLAT ON THE GROUND AND COVER IT WITH A MINIMUM OF 4 INCHES OF SOIL AND COMPACT. SOIL COMPACTION IS CRITICAL TO ELIMINATE CHANNELING UNDER THE FENCE.

NOTES:

1. SILT FENCES MUST BE IN PLACE PRIOR TO THE START OF CONSTRUCTION AND WILL REMAIN IN PLACE UNTIL STREETS, DRAINS, SANITARY SEWERS, WATERLINE AND UTILITIES HAVE BEEN CONSTRUCTED AND APPROVED.
2. CONTRACTOR WILL INSPECT THE SILT FENCES AT LEAST ONCE A WEEK AND REPAIR OR REPLACE ANY DAMAGED FENCE.
3. CONTRACTOR TO PLACE TRENCH EXCAVATION ON THE UPSTREAM SIDE OF THE TRENCH.
4. ALL SOIL, SAND, GRAVEL & EXCAVATED MATERIALS STOCKPILED ON-SITE WILL HAVE APPROPRIATELY SIZED SILT FENCE PLACED UPGRADIENT AND DOWNGRADIENT.

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 INCH = 50 FT.

LEGEND

S-1 = GEOLOGIC FEATURE AS SHOWN IN GEOLOGIC ASSESSMENT
Kep = EDWARDS PERSON LIMESTONE

SILT FENCE

"TERRATEX SC" SILT FENCE OR EQUAL INSTALLED PER MANUFACTURER'S SPECIFICATIONS. MINIMUM FENCE HEIGHT IS 2'.

GENERAL NOTES:

① FENCE TO BE INSTALLED AND MAINTAINED UNTIL CONSTUCTION OF UTILITIES IS COMPLETE AND STREET BASE IS STABILIZED.

② B.M.P. CONTROLS TO BE INSTALLED AND MAINTAINED FOR CONSTRUCTION OF STRUCTURES UNTIL SITE IS 70 PERCENT REVEGETATED OR OTHERWISE STABILIZED.

GENERAL NOTES:

1. Stone size – 3 to 5 inch open graded rock
2. Length – as effective, but not less than 50 feet.
3. Thickness – not less than 8 inches.
4. Width – not less than full width of all points of ingress or egress.
5. Washing – when necessary, wheels shall be cleaned to remove sediment prior to entrance onto public roadway. When washing is required, it shall be done on an area stabilized with crushed stone which drains into an approved strap or sediment basin. All sediment shall be prevented from entering any storm, drain, ditch, or watercourse using approved methods.
6. Maintenance – the entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public roadways. This may require periodic dressing with additional stone as conditions demand, and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public roadway must be removed immediately.
7. Drainage – entrance must be properly graded or incorporate a drainage swale to prevent runoff from leaving the construction site.

STABILIZED CONSTRUCTION ENTRANCE

STORM WATER POLLUTION PREVENTION PLAN

NEW BRAUNFELS CHURCH OF CHRIST

HWY 46 & HWY 1863
NEW BRAUNFELS, TEXAS

Temporary Sedimentation & Erosion Control Plan



JOHN LUCE
CIVIL ENGINEERING CONSULTANT
P.O. BOX 405
BULVERDE, TEXAS 78163
(830) 980-7878

REVISIONS:

DATE	BY
01/25/06	MFT
05/16/06	MFT

JOB NO. 05-1002
CLIENT:
DATE: 07/05/05
DESIGN: M.F.T.
DRAWN: M.F.T.
CHECKED:
SHEET 1 OF 1