Jon Niermann, *Chairman*Emily Lindley, *Commissioner*Toby Baker, *Executive Director* 



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 26, 2018

Mr. Paul Detterline Capitol Aggregates, Inc. 11551 Nacogdoches Road San Antonio. Texas 78217

Re: Edwards Aquifer, Comal County

NAME OF PROJECT: Capitol Aggregates Solms Operation; 1026 Solms Quarry Road; ETJ of New Braunfels and ETJ of Schertz, Texas

TYPE OF PLAN: Request for Modification of an Approved Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Regulated Entity No. RN105203939; Additional ID No. 13000782

Dear Mr. Detterline:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP Modification for the above-referenced project submitted to the San Antonio Regional Office by Geosyntec Consultants on behalf of Capitol Aggregates, Inc. on September 26, 2018. Final review of the WPAP Modification was completed after additional material was received on November 6, 2018. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) were selected 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**

The New Braunfels Quarry WPAP was approved by letter dated July 12, 2007. The site consisted of 853 acres over the Recharge Zone and 162 acres over the Transition Zone (1,015 acres total). The total impervious cover for the site was to be 80 acres. Quarrying was to occur to an elevation no deeper than 25 feet above the maximum potentiometric surface of the Edwards Aquifer. The potentiometric surface is approximately 660 feet amsl (above mean sea level) in the southern portion and 680 feet amsl in the northern portion of the site. Permanent BMPs included earthen berms, natural undisturbed vegetative buffers and the retainment of stormwater runoff within the quarry pit.

TCEQ Region 13 • 14250 Judson Rd. • San Antonio, Texas 78233-4480 • 210-490-3096 • Fax 210-545-4329

The Capitol Aggregates Solms Operation WPAP Modification was approved by letter dated May 6, 2015 for an area of approximately 1,015 acres with 853 acres over the Recharge Zone and 162 acres over the Transition Zone. Surface drainage from the Transition Zone flows away from the Recharge Zone on the site. Approximately 169 acres (16.7 percent of 1,015 acres) of impervious cover was proposed with 96 acres on the Recharge Zone. The WPAP Modification proposed numerous modifications including the following: increase the total area to be mined from 613 acres to 700 acres, move the secondary crushing plant onto the Recharge Zone, construct pre-check scale in the quarry pit, construct a shop/office building near the proposed plant entrance, and construct a hot mix asphalt plant and concrete batch plant. The quarry pit was proposed to be excavated to an elevation of 685 feet amsl in the southern portion and 705 feet amsl in the northern portion of the site. Permanent BMPs included a wet basin, numerous 50-foot natural vegetative buffer strips and numerous engineered vegetative filter strips.

#### PROJECT DESCRIPTION

This modification reduces the amount of impervious cover on the entire 1,015-acre site to 93.2 acres (9.18 percent). A total of 20.1 acres of impervious cover is proposed on the Recharge Zone with 14.0 acres consisting of pre-existing ranch roads. In summary, the following modifications are proposed: removal of the hot mix asphalt plant area consisting of 55 acres of impervious cover, removal of the northern stockpile and equipment storage area, removal of the concrete batch plant area (included in 55 acres of impervious cover), removal of the wet basin, removal of the haul road along the western site perimeter and Stream Crossing 2 (20.9 acres of impervious cover), and the addition of engineered vegetative filter strips for treatment of Stream Crossing 1 and 3. According to a letter dated March 22, 2018, signed by Mr. Robert Boyd, P.E., with Comal County, the site is suitable for the use of on-site sewage facilities which will be located on the Transition Zone.

# PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or up-gradient of the site and potentially flowing across and off the site after construction, numerous engineered vegetative filter strips (VFS), designed using the TCEQ technical guidance document, <u>Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices (2005)</u>, will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for the site is 4,488 pounds of TSS generated from 5.0 acres of impervious cover. The approved measure meets the required 80 percent removal of the increased load in TSS caused by the project.

The proposed 15-foot wide VFS are associated with two stream crossings, plus the entrance road and will treat a total of 5.0 acres of impervious cover with 4,488 pounds of TSS removal. The VFS shall have a uniform slope of less than 20 percent and vegetated cover of at least 80 percent which will extend along the entire length of the contributing area and will be free of gullies or rills that can concentrate overland flow. The contributing area shall be relatively flat to evenly distribute runoff, and the impervious cover in the direction of flow shall not exceed 72 feet.

In addition, stormwater runoff that contacts sediment within the quarry will be retained within the quarry pit. A total of 1.1 acres of impervious cover exists within the quarry pit. Earthen berms will be implemented along the quarry periphery.

## **GEOLOGY**

According to the geologic assessment included with the application, a portion of the site is located on the Buda Limestone, Del Rio Clay, and Georgetown Formation. The majority of the site is located on the Person Formation. The combined geologic and manmade features totaled 113 of which 19 were sensitive per the 2007 Geologic Assessment. The July 12, 2007 TCEQ approval letter indicated that sensitive features S-21 (sinkhole), S-23 (solution cavity), S-36 (cave), S-70 (solution cavity), S-71 (solution enlarged fractures), S-78 (zone of solution enlarged fractures) and S-100 (sinkhole) in the

proposed quarry pit can be temporarily sealed and then mined out as the mining operation proceeds near features. The May 6, 2015 TCEQ approval letter indicated that feature S-57 (manmade boring), S-60 (sinkhole) and S-83 (water well) can be temporarily sealed and then mined out in addition to the previously approved features. The San Antonio Regional Office site assessment conducted on October 26, 2018 revealed that the site was generally as described in the application.

# SPECIAL CONDITION

This modification is subject to all Special and Standard Conditions listed in the WPAP approval letter dated July 12, 2007 and subsequent modification dated May 6, 2015.

# 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. Ten wells exist 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 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 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:

- 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 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.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Dianne Pavlicek-Mesa, P.G., of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210-403-4074.

Sincerely,

Lynn Bumguardner, Water Section Manager

San Antonio Region

Texas Commission on Environmental Quality

LB/DPM/eg

cc:

Enclosures: Deed Recordation Affidavit, Form TCEQ-0625

Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

Mr. Brandon Klenzendorf, Ph.D., P.E., Geosyntec Consultants

Mr. Robert Boyd, P.E., Comal County Mr. Mark Enders, City of New Braunfels

Mr. Brian James, City of Schertz

Mr. H. L. Saur, Comal Trinity Groundwater Conservation District

Mr. Roland Ruiz, Edwards Aguifer Authority

# EDWARDS AQUIFER APPLICATION WATER POLLUTION ABATEMENT PLAN MODIFICATION

Capitol Aggregates Solms Operation Comal County, Texas

Submitted to



1026 Solms Quarry Road New Braunfels, Texas 78132

Submitted by



engineers | scientists | innovators

Engineering Firm Registration No. 1182 8217 Shoal Creek Blvd, Suite 200 Austin, Texas 78757

September 2018

# **Texas Commission on Environmental Quality**

# **Edwards Aquifer Application Cover Page**

# **Our Review of Your Application**

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

#### **Administrative Review**

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

#### **Technical Review**

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

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

#### **Mid-Review Modifications**

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

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

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

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

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

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

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

1. Regulated Entity Name: Capitol Aggregates Solms Operation				2. Regulated Entity No.: RN105203939					
3. Customer Name: Capitol Aggregates Inc.			4. Customer No.: CN 604033142						
5. Project Type: (Please circle/check one)	New Modification			Extension Exception		Exception			
6. Plan Type: (Please circle/check one)	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Resider	ntial	Non-r	esiden	tial		8. Site (acres): WPAP Mod for Acres		
9. Application Fee:	\$10,00	0	10. Permanent BMP(s):			(preasso	Vegetated filter strips for this WPAP modification previously approved BMPs outside the area associated with this WPAP modification will not be modified and include: natural vegetated buffer area and the quarry pit)		

11. SCS (Linear Ft.):	N/A	12. AST/UST (No. Tanks):	1 (approved 30 November 2017)
13. County:	Comal	14. Watershed:	Dry Comal Creek

# **Application Distribution**

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

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

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

Austin Region							
County:	Hays	Travis	Williamson				
Original (1 req.)	_						
Region (1 req.)	_		_				
County(ies)			_				
Groundwater Conservation District(s)	Edwards Aquifer Authority Barton Springs/Edwards Aquifer Hays Trinity Plum Creek	Barton Springs/ Edwards Aquifer	NA				
City(ies) Jurisdiction	AustinBudaDripping SpringsKyleMountain CitySan MarcosWimberleyWoodcreek	AustinBee CavePflugervilleRollingwoodRound RockSunset ValleyWest Lake Hills	AustinCedar ParkFlorenceGeorgetownJerrellLeanderLiberty HillPflugervilleRound Rock				

San Antonio Region							
County:	Bexar	Comal	Kinney	Medina	Uvalde		
Original (1 req.)		<u>X</u>					
Region (1 req.)		_ <u>X</u> _					
County(ies)		_X_					
Groundwater Conservation District(s)	Edwards Aquifer Authority Trinity-Glen Rose	_X_Edwards Aquifer Authority _X_Comal Trinity	Kinney	EAA Medina	EAA Uvalde		
City(ies) Jurisdiction	Castle HillsFair Oaks RanchHelotesHill Country VillageHollywood ParkSan Antonio (SAWS)Shavano Park	BulverdeFair Oaks RanchGarden Ridge _X_New Braunfels _X_Schertz	NA	San Antonio ETJ (SAWS)	NA		

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.					
J. Brandon Klenzendorf, P.E.	J. Brandon Klenzendorf, P.E.				
Print Name of Customer/Authorized-Agent					
J. Brandon Klysh	9.17.2018				
\$Ignature of Customer/Authorized Agent	Date				

**FOR TCEQ INTERNAL USE ONLY**					
Date(s)Reviewed: Date Administratively Complete:					
Received From:	Correct Number of Co	pies:			
Received By:	Distribution Date:				
EAPP File Number:	Complex:				
Admin. Review(s) (No.):	No. AR Rounds:				
Delinquent Fees (Y/N):	Review Time Spent:				
Lat./Long. Verified:	SOS Customer Verifica	ation:			
Agent Authorization Complete/Notarized (Y/N):	Payable to T	CEQ (Y/N):			
Core Data Form Complete (Y/N):	Check: Signed (Y/N	J):			
Core Data Form Incomplete Nos.:	Less than 90	Less than 90 days old (Y/N):			

# **General Information Form**

Print Name of Customer/Agent: J. Brandon Klenzendorf, P.E.

**Texas Commission on Environmental Quality** 

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

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

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

# Signature

Date: 9.17.2018

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:

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Sig	nature of Customer/Agent:
PI	Branden Kyol  113007  Cens  Constitution
1.	Regulated Entity Name: Capitol Aggregates Solms Operation
2.	County: Comal
3.	Stream Basin: Dry Comal Creek
4.	Groundwater Conservation District (If applicable): Edwards Aquifer Authority; Comal Trinity
5.	Edwards Aquifer Zone:
	Recharge Zone Transition Zone
6.	Plan Type:
	WPAP ☐ AST   ☐ SCS ☐ UST   ☑ Modification ☐ Exception Request

7.	Customer (Applicant):
	Contact Person: Paul Detterline Entity: Capitol Aggregates, Inc. Mailing Address: 11551 Nacogdoches Road City, State: San Antonio, Texas Zip: 78217 Telephone: 210-871-7214 FAX: N/A Email Address: Paul.Detterline@CapitolAggregates.com
3.	Agent/Representative (If any):
	Contact Person: Brandon Klenzendorf Entity: Geosyntec Consultants Mailing Address: 8217 Shoal Creek Boulevard, Suite 200 City, State: Austin, Texas Zip: 78757 Telephone: 512-354-3281 FAX: N/A Email Address: bklenzendorf@geosyntec.com
€.	Project Location:
	<ul> <li>☐ The project site is located inside the city limits of</li> <li>☐ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of City of New Branufels ETJ (generally north of the Union-Pacific railroad) and the City of Schertz ETJ (generally south of the Union-Pacific railroad).</li> <li>☐ The project site is not located within any city's limits or ETJ.</li> </ul>
10.	The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.
	The project site is located at 1026 Solms Quarry Road in Comal County, Texas  (Attachment A). The project site entrance is on the north side of FM 482  approximately 1,200 feet to the west of the intersection of Marigold Way and FM  482. The southern boundary of the site is located adjacent to FM 482. The northern boundary of the site is an existing ranch road approximately 850 feet to the south of Word Ranch Road. The eastern boundary of the site is an existing pipeline easement The western boundary of the site is the existing Dean Word quarry site.
11.	Attachment A – Road Map. A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.
12.	Attachment B - USGS / Edwards Recharge Zone Map. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached. The map(s) clearly show:
	<ul> <li>☑ Project site boundaries.</li> <li>☑ USGS Quadrangle Name(s).</li> <li>☑ Boundaries of the Recharge Zone (and Transition Zone, if applicable).</li> </ul>

	$oxedsymbol{oxed}$ Drainage path from the project site to the boundary of the Recharge Zone.
	The TCEQ must be able to inspect the project site or the application will be returned. Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.
	Survey staking will be completed by this date: N/A. The site is an active quarry and limited survey staking is existing due to ongoing operations. Site personnel will be available to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities; the geologic or manmade features noted in the Geologic Assessment were previously inspected by TCEQ during the original WPAP application and previous WPAP modification.
	Attachment C – Project Description. Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:
	<ul> <li>✓ Area of the site</li> <li>✓ Offsite areas</li> <li>✓ Impervious cover</li> <li>✓ Permanent BMP(s)</li> <li>✓ Proposed site use</li> <li>✓ Site history</li> <li>✓ Previous development</li> <li>✓ Area(s) to be demolished</li> </ul>
15. Exis	ting project site conditions are noted below:
	<ul> <li>□ Existing commercial site</li> <li>□ Existing industrial site</li> <li>□ Existing residential site</li> <li>○ Existing paved and/or unpaved roads</li> <li>○ Undeveloped (Cleared)</li> <li>○ Undeveloped (Undisturbed/Uncleared)</li> <li>□ Other:</li> </ul>
Proh	ibited Activities
	I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:
	(1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
(	(2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
(	(3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;
	(4) The use of sewage holding tanks as parts of organized collection systems; and

- (5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).
- (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.
- 17. I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:
  - (1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);
  - (2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and
  - (3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

# **Administrative Information**

18. The	e fee for the plan(s) is based on:
	For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.  For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.  For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.  A request for an exception to any substantive portion of the regulations related to the protection of water quality.  A request for an extension to a previously approved plan.
19. 🔀	Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:
	<ul> <li>☐ TCEQ cashier</li> <li>☐ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)</li> <li>☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)</li> </ul>
20. 🔀	Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
21. 🔀	No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

# Attachment A - Road Map

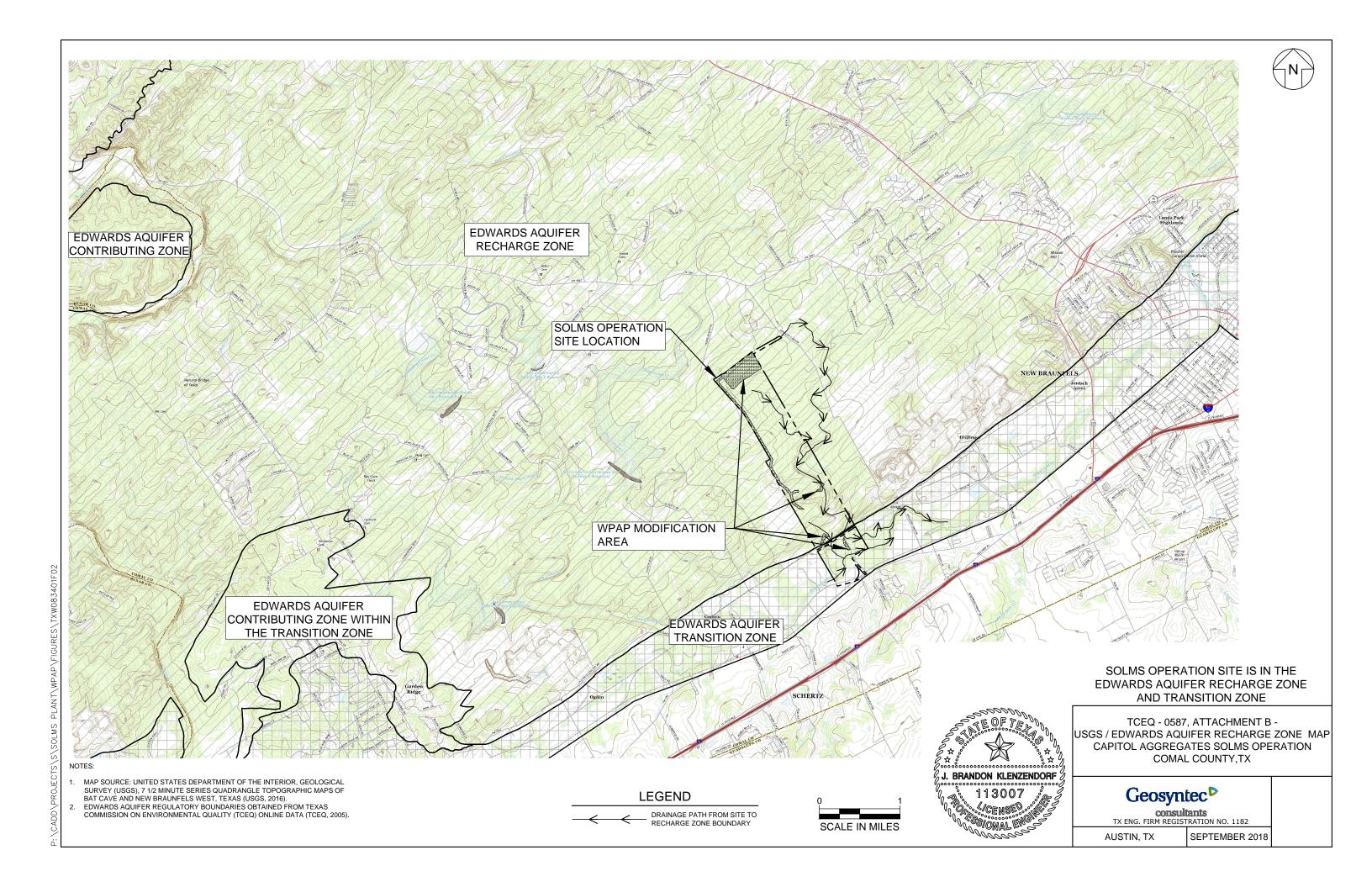
See attached Road Map with directions to the Solms Operation Site which includes the limits of the area associated with the proposed WPAP modification request and site boundaries clearly shown.

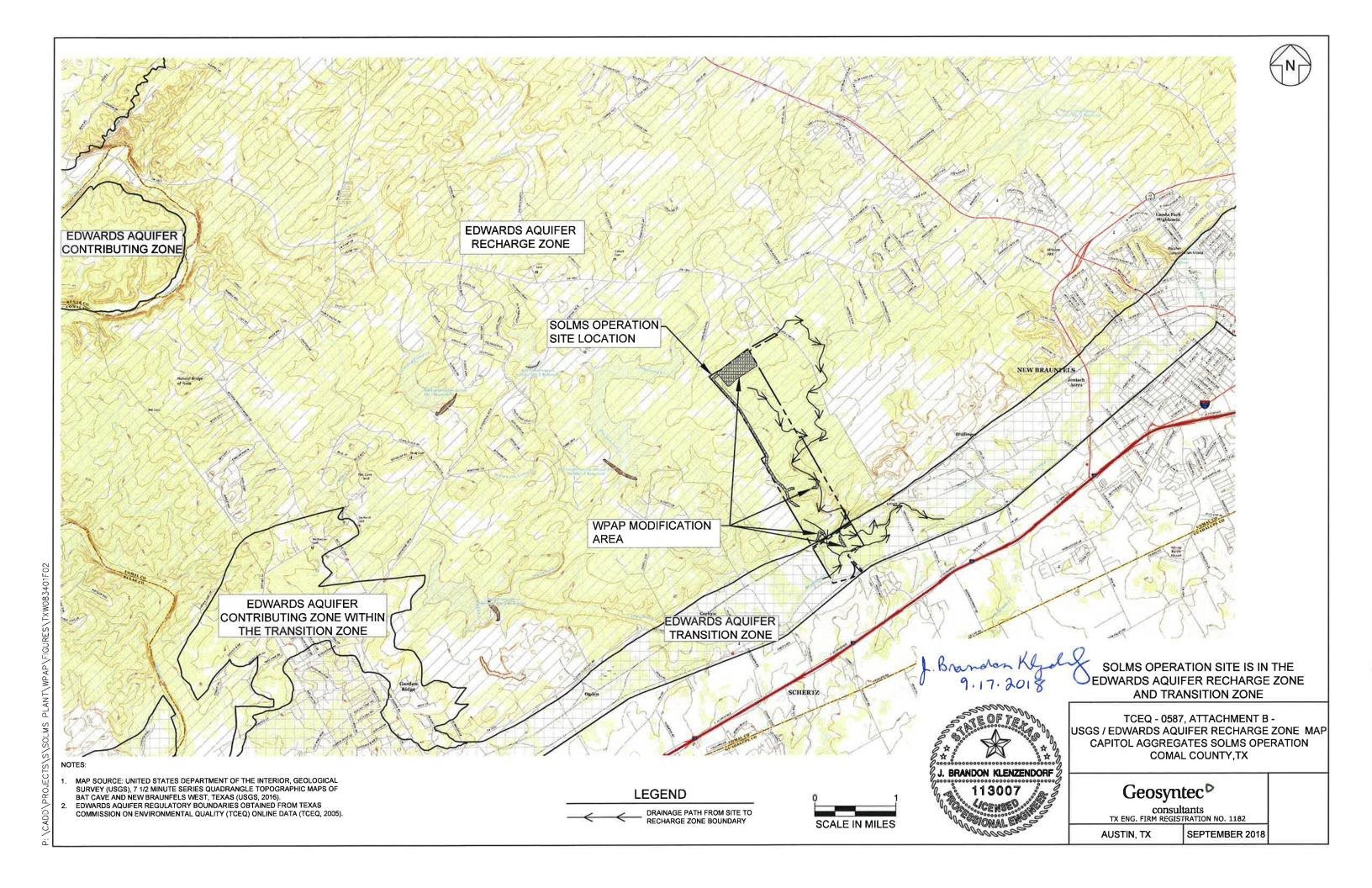
# Attachment B - USGS/Edwards Recharge Zone Map

See attached USGS/Edwards Recharge Zone Map with the official 7 ½ minute USGS Quadrangle Map (scale: 1" = 2000') of the Edwards Recharge Zone. The map clearly shows the Solms Operation Site and the area associated with the proposed WPAP modification boundaries, USGS Quadrangle names, boundaries of the Edwards Aquifer Recharge Zone and Transition Zone, and drainage path from the project site to the boundary of the Recharge Zone.

P:\CADD\PROJECTS\S\SOLMS PLANT\WPAP\FIGURES\TXW083401F01

PLANT\WPAP\FIGURES\TXW083401F01 CADD\PROJECTS\S\SOLMS





# **Attachment C – Project Description**

Capitol Aggregates, Inc. (Capitol Aggregates) proposes to modify approved activities and features proposed within the project limits of the Capitol Aggregates Solms Operation at 1026 Solms Quarry Road, New Braunfels, Texas. The overall Solms Operation Site includes areas in both the Edwards Aquifer Recharge Zone and Transition Zone and has an approved Water Pollution Abatement Plan (WPAP) submitted by Westward Environmental, Inc. on behalf of Holcim (US) Inc. on 6 April 2007. The WPAP was approved on 12 July 2007 (Edwards Aquifer Protection Program ID No. 2643.00). According to the original WPAP application, the entire Capitol Aggregates Solms Operation Site consists of 1,015 acres with 853 acres on the Edwards Aquifer Recharge Zone and 162 acres on the Transition Zone. Permanent pollution abatement measures consisted of earthen berms, rock berms, and natural vegetated buffer areas during the site preparation and excavation/processing phase.

A WPAP modification was approved on 6 May 2015 and included a wet basin (referred to as a "stormwater detention pond" in the WPAP modification application) as a permanent Best Management Practice (BMP) to provide treatment for the previously proposed hot mix plant, stockpile and equipment storage area, and concrete batch plant area as well as "overtreatment for the (stream) crossings and paved areas of the entrance road". An Aboveground Storage Tank (AST) Plan was approved on 30 November 2017 and includes one 10,000-gallon diesel fuel tank located next to the scale house.

This WPAP modification request consists of removing the previously approved 62-acre hot mix plant, stockpile and equipment storage area, 4-acre concrete batch plant area, and associated 5acre wet basin in the northern portion of the site over the Edwards Aquifer Recharge Zone as well as the haul road from the south portion to the north portion of the site and Stream Crossing 2 along the haul road. Construction of these features has not commenced. A designated area for hot mix asphalt plant activities is reserved for leasing by others in a 12.1-acre tract in the southern portion of the site immediately to the east of the scale house and over the Edwards Aquifer Transition Zone. The approved northern stockpile and equipment storage area will no longer be required since the existing quarry pit was previously approved as a plant and stockpile area which includes equipment storage. The approved concrete batch plant area will also no longer be required. The wet basin was approved to provide "overtreatment for the (stream) crossings and paved areas of the entrance road". Because of the removal of the proposed hot mix plant, stockpile and equipment storage area, and concrete batch plant areas, the wet basin will no longer be required. The stream crossings and paved areas of the entrance road on the southern portion of the site will instead be treated with proposed vegetated filter strip permanent BMPs as part of this WPAP modification. Construction has not commenced on the previously approved stream crossings. The WPAP modification request also includes construction of a proposed lab

building and septic tank near the scale house on the southern portion of the site over the Edwards Aquifer Transition Zone.

Survey staking will not be completed because the site is an active quarry and limited survey staking is currently existing due to ongoing quarry operations. Site personnel will be available 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 near the boundaries of the area associated with the WPAP modification request.

In summary, Capitol Aggregates proposes to modify the existing WPAP at the Capitol Aggregates Solms Operation in order to:

- 1) **Remove the Hot Mix Plant Area:** Remove the approved 62-acre hot mix plant area in the northern portion of the Site over the Edwards Aquifer Recharge Zone; a designated area for hot mix asphalt plant activities is reserved for leasing by others in a 12.1-acre tract in the southern portion of the site over the Edwards Aquifer Transition Zone.
- 2) **Remove the Stockpile and Equipment Storage Area:** The approved northern stockpile and equipment storage area will no longer be required since the existing quarry pit was previously approved as a plant and stockpile area which includes equipment storage.
- 3) **Remove the Concrete Batch Plant Area:** Remove the approved 4-acre concrete batch plant area from the Site; a concrete batch plant is no longer proposed.
- 4) **Remove the Wet Basin:** Due to the removal of impervious cover associated with the hot mix plant, stockpile area, equipment storage area, and concrete batch plant area from the Edwards Aquifer Recharge Zone, the 5-acre wet basin is no longer required or proposed; runoff from other on-site impervious cover will be treated with proposed vegetated filter strips or be retained in the quarry pit as permanent BMPs.
- 5) Remove the Haul Road, Adjacent Vegetated Buffers, and Stream Crossing 2: Due to the removal of the proposed hot mix plant, stockpile and equipment storage area, and concrete batch plant areas in the northern portion of the property, the 20.9 acres of approved haul road and associated vegetated buffers along the western site perimeter will no longer be required. The removal of the haul road will also eliminate the need for Stream Crossing 2 (concrete crossing with four 18-inch culverts) in the approved WPAP.
- 6) Addition of Permanent Engineered Vegetated Filter Strips: Due to the removal of the wet basin, proposed gravel impervious cover associated with Stream Crossings 1 and 3 will require water quality treatment. The addition of permanent engineered vegetated filter strips adjacent to Stream Crossings 1 and 3 will serve as treatment for this limited amount of impervious cover located outside the quarry pit. Furthermore, permanent engineered vegetated filter strips are proposed west of the construction entrance and south of the infrastructure at the entrance to the quarry.

- 7) **Addition of Lab Building:** The proposed lab building will be constructed near the scale house and over the Edwards Aquifer Transition Zone. This building will be less than 1,000 square feet in impervious cover.
- 8) **Addition of Septic Tank:** The proposed septic tank will be constructed near the scale house and over the Edwards Aquifer Transition Zone. The Transition Zone drains away from the Recharge Zone. A Suitability Letter from the Office of Comal County Engineer is provided in this WPAP modification request.

# Area of the Site

According to the approved WPAP, the total area of the Capitol Aggregates Solms Operation Site is 1,015 acres. This WPAP modification only applies to the area associated with regulated activities proposed to be modified. The total area of the WPAP modification is 123 acres as shown on the Site Plans.

# Off-Site Areas

Off-site areas adjacent to the Site consist primarily of ranchland or quarry sites operated by others. Off-site areas are not required for any quarry operations associated with this project.

# Impervious Cover

The approved WPAP lists the total impervious cover as 169 acres of which approximately 96 acres is located over the Edwards Aquifer Recharge Zone and the remaining 73 acres is located over the Edwards Aquifer Transition Zone. The total site impervious cover was approved at 16.7%, which consists of 11.3% impervious cover over the Recharge Zone and 45.1% impervious cover over the Transition Zone.

A reduction in impervious cover over the Edwards Aquifer Recharge Zone of 86.9 acres is proposed as a result of this WPAP modification (i.e., removal of the 62-acre hot mix plant, stockpile and equipment storage area, removal of the 4-acre concrete batch plant area, and removal of the haul road which is approximately 20.9 acres). The proposed impervious cover over the Edwards Aquifer Recharge Zone is 9.1 acres (1.1%). The proposed impervious cover over the Edwards Aquifer Transition Zone will increase slightly due to the addition of the lab building to 73.1 acres (45.1%). Therefore, the total impervious cover for the site is proposed to be reduced to 82.2 acres (8.1%).

#### Permanent BMPs

Permanent Best Management Practices (BMPs) approved for this facility under EAPP ID No. 2643.00 included earthen berms, rock berms, vegetated buffers, engineered vegetated filter strips, and the quarry pit. Quarrying was approved to within 25 feet of the groundwater table

(685 feet mean sea level (MSL) in the southern portion of the Site and 705 feet MSL in the northern portion of the Site). These BMPs, as well as temporary BMPs, will continue to be used by Capitol Aggregates, along with base material and paved pads for fueling and maintenance, and a wheel wash. The previously approved wet basin will no longer be required as a permanent BMP due to the removal of impervious cover and the addition of permanent vegetated filter strips to treat runoff from the Stream Crossings 1 and 3 and the entrance road into the quarry pit.

## Proposed Site Use

The proposed project associated with this WPAP modification request will not modify the site use as a limestone and gravel quarry.

# Site History and Previous Development

The Solms Operation Site was approved for operation as a quarry following approval of the original WPAP on 12 July 2007. Multiple Requests for the Extension of Time to Commence Regulated Activities Authorized by a WPAP were submitted, including requests approved on the following dates: 10 August 2009, 12 January 2010, 23 August 2010, 7 March 2011, 24 August 2011, 30 January 2012, 30 July 2012, 15 February 2013, 25 July 2013, 7 February 2014, and 30 July 2014. A WPAP modification was submitted and subsequently approved on 6 May 2015. An AST Plan was submitted and subsequently approved on 30 November 2017.

A Geologic Assessment was conducted in 2007 as part of the approved WPAP and updated in 2015 as part of the approved WPAP modification. Nineteen (19) of the 113 mapped features were classified as sensitive. Sensitive features will be protected by the use of silt fences, rock berms, and earthen berms, and flow to naturally occurring sensitive features will be maintained to the maximum extent possible. Because the approved land use calls for the removal, by excavation, of the sensitive features within the quarry limits, no permanent sealing of features was requested. However, in order to protect water quality during operation of the quarry, sensitive features that lie within the approved quarry area will be temporarily sealed prior to their excavation.

The site was primarily undeveloped until 2009 when Comal County started construction of the Dry Comal Creek Flood Retarding Structure. The flood retarding structure was completed in 2013 and is located in an easement within the limits of the approved WPAP. The remainder of the site remained undeveloped until late 2014 when construction commenced in preparation for quarry activities including construction of the scale house. Quarry operations began in 2015.

Activities authorized in the previously approved WPAP such as clearing of the initial (temporary) plant area, initial quarry area and roads, as well as construction of BMPs (i.e., temporary earthen berms, silt fences, mulching, and construction entrance/exits) are either

Capitol Aggregates WPAP Modification Capitol Aggregates Solms Operation TCEQ-0587, General Information Form

completed or ongoing at this time. A number of ranch roads are existing and will continue to be used for access within the site for quarry and ongoing ranching operations. Aside from the modifications proposed above, Capitol Aggregates intends to continue quarry operations and BMPs on-site as described in the currently approved WPAP. Material stockpiles will be stored both on the Edwards Aquifer Recharge Zone and on the Edwards Aquifer Transition Zone.

Areas to be Demolished

No areas are proposed to be demolished for this project.

# 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: Holcim +/- 1015 Acre Site
TYPE OF PROJECT: X WPAP AST SCS UST
LOCATION OF PROJECT: X Recharge Zone Transition Zone Contributing Zone within the
PROJECT INFORMATION

- 1. X Geologic or manmade features are described and evaluated using the attached GEOLOGIC ASSESSMENT TABLE.
- 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*	Thicknes s (feet)			
Comfort -Rock (CrD)	D	<1'			
Eckrant-Rock (ErG)	D	1'			
Medlin-Eckrant (MED)	С	7.6'			
Purves Clay (PuC)	С	1.5'			
Rumple-Comfort (RUD)	С	4'			

- \* Soil Group Definitions (Abbreviated)
- A. Soils having a <u>high infiltration</u> rate when thoroughly wetted.
- B. Soils having a  $\underline{\text{moderate infiltration}}$  rate when thoroughly wetted.
- C. Solls having a slow infiltration rate when thoroughly wetted.
- D. Solls having a  $\underline{\text{very slow infiltration}}$  rate when thoroughly wetted.
- 3. X 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. X 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. X 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'' = 400 'Site Geologic Map Scale 1'' = 400 'Site Soils Map Scale (if more than 1 soil type) 1'' = 400 '

6. Method of collecting positional data:

X Global Positioning System (GPS) technology.

- Other method(s).
- 7. X The project site is shown and labeled on the Site Geologic Map.
- 8. X Surface geologic units are shown and labeled on the Site Geologic Map.
- 9. X Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
  - Geologic or manmade features were not discovered on the project site during the field investigation.
- 10. X The Recharge Zone boundary is shown and labeled, if appropriate.
- 11. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.):
  - X There are 6 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.
    - 3 The wells are not in use and will be properly abandoned.
    - The wells are in use and comply with 16 TAC Chapter 76.
  - There are no wells or test holes of any kind known to exist on the project site.

#### ADMINISTRATIVE INFORMATION

12. X One (1) original and three (3) copies of the completed assessment has been provided.

Date(s) Geologic Assessment was performed: October 31, November 1, 2, 7, 9, 13, 15, 20, 21, 27, 28, and 29, 2006

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 Chapter 213.

Thomas O. Mathews II, P.G. #5321

830-249-8284

Print Name of Geologist

Telephone

030

Fax

Signature of Geologist

Date

Representing: Westward Environmental, 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 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.

THOMASO, MATHEW

14.00																			
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I have read, I understood, and I have followed the Texas Commission on Environmental Quality'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 with qualified as a geologist as defined by 30 TAC Chapter 213.

TCEQ-0585-Table (Rev. 10-01-04)

THOWASO, MATHEWS
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GEO	LOGIC AS	GEOLOGIC ASSESSMENT TA	TABLE	ш			PR	SEC.	PROJECT NAME:										
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SF	Solution-enlar	Solution-enlarged fracture(s)			20		0	Loose	Loose ar soft mud or soll, organics, leaves, sticks, dark calors	il, org	onics, leav	res, sticks,	dark colors						

	BA INFILLING	N Nane, expased bedrock	C Coarse - cobbies, breakdown, send, 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, Hillop, Hilside, Drainege, Floodpiain, Streambed
	2B POINTS	30	20	20	20	5	30	30	20	2	30
NAL 83	TYPE	Cave	Solution cavity	Solution-enlarged fracture(s)	Fault	Other natural bedrock features	Manmade feature in bedrock	Swellow hole	Sinkhole	Non-karst closed depression	Zone, clustered or aligned features
DATUM: NAD 83	2A TYPE	b	SC	SF	L	0	MB	SW	ጜ	8	2

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here compiles with that document and is a true representation of the conditions observed in the field. My signature certifies that I appropriating as a geologist as defined by 30 TAC Chapter 213. Ilside, Drainage, Floodpiain, Straambed

TCEQ-0585-Table (Rev. 10-01-04)

Sheet 2 of 7

TEGWAS C. MATHEWS GEOLDSY

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	LOCATION	NC					<b>FEAT</b>	TURE CI	FEATURE CHARACTERISTICS	FRIST	cs	Í		E	EVALUATION	LION	۵	HYSIC	PHYSICAL SETTING
17	18*	-51	82	238	2		,	_	ş	84	7	2	89	٥		10			12
FEATURE ID	LATITUDE	LOHGINOE	FEATURE	PO9175	FORMATION	OUE	Olutinsions (FEET)		ттемо (обоявез)	DENSITY C (NOFT)	TTY APERTURE (FEET)	URB MFILL	RELATIVE BEPATEMENTON	TOTAL	101	EUSTVITY	CATCHIII	CATCHURUT AREA (AGRES)	TOPOGRAPHY
						×	*	z		10					979	Ħ	41.6	212	
S-35	29 40.15	98 12.63	SC	20	0 Kep	3	1 4	4.5 E-W		_		z	5	L	25 X			×	FLOODPLAIN
S-36	29 40.14	98 12.88	O	30	30 Kep	15	8	7 N4E	The same of		10 P. C.	Z	40	70		×	×		HILLTOP
1	29 40.14	98 12.88	SC	20	20 Kep	3	1.3 1	1.3 N76W	2	L		0	15		35 X		×		HILLTOP
	29 40.15	98 12.66	SC	20	20 Kep	0.5	0.5	0.8 E-W				0	15		35 X	200	×	_	HILLTOP
	29 40.15	98 12.66	SC	20	Kep	0.8	0.8	1 E-W				0	15		35 X		×		HILLTOP
	29 40.15	98 12.42	SF	20	Kep	80	12 0	0.1 N12E			3 0	0.1 O/F	10		30 X			×	STREAMBED
S-41	29 40.15	98 12.42	SF	20	Kep	0.5	2	1 N30E	,,,			ш	5	L	25 X		×		FLOODPLAIN
	29 40.17	98 12.63	SC	20	Kep	-	-	2 N40W	2			0	15		35 X			×	FLOODPLAIN
	29 40.19	98 12.68	SC	20	Kep	0.5	0.5	9.0				O/F			25 X		×	_	HILLTOP
	29 40.2	98 12.51	MB-W	30	Kep	0.3	0.3 150	50				×	5		35 X		×		HILLTOP
S-45	29 40.27	98 12.70	သွင	20	Kep	-	-	-				O/F	10		30 X		×		HILLTOP
	29 40.69	98 12.75	20	5	5 Kep	3,5	9	1 N40W	2			O/F	25		30 X		×		HILLTOP
S-47	29 40.24	98 12.93	O-VR	5	5 Kep	150	15	N41W	>		10 0.1 - 0 N	NO.	10		15 X		×		HILLSIDE
S-48	29 40.23	98 13.00	SC	20	Kep	0.5	0.5	1.5 N40W	2			0	8		28 X		×	-	HILLTOP
S-49	29 40.25	98 12.92	Z-SC	30	30 Kep	20	4	N80E	m	3	0.3	10	8		38 X		×	_	HILLSIDE
09-S	29 40.25	98 12.86	Z-SC	30	Kep	10	2	2 N111	2 N11W,N85W			0	6	39	_	×	×	1	HILLSIDE
S-51	29 40.3	98 12.61	SC	20	0 Kep	2	1.3	3 N34E				ш.	10		30 X			×	STREAMBED
DATUM	DATUM: NAD 83																		
2A TYPE		TYPE		2E	2B POINTS						BA IN	BA INFILLING							
O	Cave				30		ž z	one, expos	None, exposed bedrock										
SC	Solution cavity				20		ٽ ن	oarse - co	Coarse - cobbles, breakdown, sand, gravel	down, s	and, grav	100							
SF	Solution-enlarged fracture(s)	d fracture(s)			20		0 6	pose or so	1 mud ar so	II, organ	cs, leave	s, sticks,	Loose or soft mud or soil, organics, leaves, sticks, dark colors						
L	Fault				20		F	ines, comp	acted clay-	ich sedi	nent, soil	profile, g	Fines, compacted clay-rich sediment, soil profile, gray or red colors						
0	Olher natural bedrock features	drock features			5		V Ve	egetation.	Vegetation. Give details in narrative description	in nerra	he desca	ription							
MB	Manmade feature in bedrock	re in bedrock			30		FS FI	lowstone, c	Flowstone, cements, cave deposits	ve depo	sils								
SW	Swallow hole				30		ŏ ×	Other materials	els										
SH	Sinkhole				20	8 8													
CO	Non-karst closed depression	d depression			5					12 TOP	12 TOPOGRAPHY	*							

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THOMAS O. MATHEWS

TCEQ-0585-Table (Rev. 10-01-04)

	LOCATION	2					FEAT	FEATURE CHARACTERISTICS	ACTE	RIST	SS			EV	EVALUATION	LION	Ь	HYSIC	PHYSICAL SETTING	TING
¥	-81	10.	ន	20	ť		٠,	8		5A 6	7	AA	98	a		10	-		-	12
FEATURE ID	LATHUOE	longwype	FEATURE	POBITS FG	FORMATIC	DELEN	DELEVISIONS (FEET)	IN INENDIOEGNEES	DON	DENSITY (NOFT)	TY APENTURE T) (TEET)	TE METE	RELATIVE DIFILIRATION RATE	T07AL	AZ C	SCHAMMIY	CATCHMENT ANEA	EIIT AMEA	toros	GFOGRAMY
						×	>	2	5	0					640	윘	41.6	21.0		
S-52 Z	29 40.31	98 12.72	F	20 Kep	難	1100	100	NesE	2000	10		O/F	15	45	200	×	200	×	STREAMBED	(BED
9-53	29 40,29	98 12.78	Z-CD	30 Kep	cep	750 100	100	3 N65E		10		O/F	15	65		×		ii.	STREAMBED	BED
S-54 Z	29 40.31	98 12.91	8	5 4	5 Kep	30	17	1 N73E				0/0	8	13	13 X		×		HILLSIDE	D1
S-55 2	29 40.33	98 12.83	SC	20 Kep	(ep	2	2.5	1 N70E				N/O	6	39 X	×		×		HILLSIDE	E) 1
		98 12.53	SF	20 Kep	(ep	0.3	0.5	2				O/F	10		×		×		HILLTOP	
S-67 Z	29 40.56	98 13,03	MB-B	30 Kep	(ep	8.0	8.0	3	7	1		z	35	99	100	×	×		HILLTOP	
	29 40.39	98 12.69	SC	20 Kep	dey	8.0	+	1.5 N40E	,-	10		F/0	6		×		×		HILLTOP	
	29 40.39	98 12.79	SF	20 Kep	(ep	1	0.5 1	1.5 N28W				0	8		×		×		HILLTOP	•
S-80 Z	29 40.38	98 12.88	HS	20 Kep	dey	6	4	3 N56E	TO SE	10	Section Section	C/N	35	65		×	×		HILLTOP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Г		98 12.88	SH	20 Kep	dey	4	-	.5 N19W			1	10	15	5	×		×		HILLTOP	
		98 12.99	SC	20 Kep	day	0.3	0.7 0	0.8 N73E				0	8		×		×		HILLSIDE	וען
		98 12.67	S	5 k	5 Kep	10	5	2 N83W				S	10		×		- 1		STREAMBED	1BED
199		98 12.67	Z-8C	30 Kep	(ep	100 300	300	N40W	100			0/0	20			×	Carried Street	×	STREAMBED	BED
		98 12.83	SH	20 Kep	(ep	6	12 0	0.5 N82E				O/F	15		×		×		HILLTOP	
	29 40.46	98 12.65	ч	20 Kep	(ep	9	8 0	0.7 N50E	,-	10		×	5		25 X		×		FLOODPLAIN	LAIN
S-67 2	29 40.47	98 13.13	CD	5	5 Kep	20	8 0	0.7 N67W				0/0	10		×		×		HILLTOP	'n
S-68 2	29 40.47	98 13.14	SF	20 Kep	(ep	9	1 2	2.3 N-S	H	Ц		O/F	10	Ш	30 X		×		HILLTOP	
Z.W.:	DATUM: NAD 83																			
2A TYPE		TYPE		2B PC	2B POINTS						BAINE	BA INFILLING								
J	Cave				30	_	N N	None, exposed bedrack	bedrock											
(J)	Solution cavity				20		ပိ	Coarse - cobbios, breakdown, sand, gravel	s, break	down, se	ind, grave	-								
5)	Solution-enlarged fracture(s)	d fracture(s)			20		0	Loose or soft mud or soll, organics, leaves, sticks, dark colors	ld or so	l, organic	es, leaves	sticks, o	ark colors							
	Fault				20	_	F Fir	nes, compact	nd clay-n	ch sedin	nent, soil	profile, go	Fines, compacted clay-rich sediment, soil profile, gray or red colors							
0	Other natural bedrock features	drack features			c	_		Vegetation. Give details in narrative descriptior	details	in nama	ive descri	ption								
~	Manmade feature in bedrock	e in bedrock			30	_	FS Flo	Flowstone, cements, cave deposits	ents, cav	sodep er	alts									
C)	Swallow hole				30	-1	o ×	Other materials												
U)	Sinkhale			ž	20															
4	Non-karst closed depression	depression			c)					2 TOPC	12 TOPOGRAPHY									
_	Zone shirteend or allocad feathers	contrast faculta se	,		5		SOLI THE	Olf Little Different Cleaning Comments	- Internation											

I have road, I understood, and I have followed the Texas Commission on Environmental Quality's instructions to Geologists. The information presented here comples with that document and is a true representation of the conditions observed in tha field,

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TCEQ-0585-Table (Rev. 10-01-04)

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TEOMAS O. MATHEWS

GEO	GEOLOGIC ASSESSMENT TABLE	SESSMEN.	T TABL	ш			PR	OJEC	PROJECT NAME:											
	LOCATION	NO					FE/	ATUR	FEATURE CHARACTERISTICS	FERIS	TICS	9			EV	EVALUATION	NOI	ā	HYSIC	PHYSICAL SETTING
¥	-01	.c.	72	330	c		٠.	П	9	3		7	3	69	0		10			12
r EATURE ED	admirke de	Source	FEATURE	PORTE	FORMAN		CINE (FLET)	(FLET)	TREND (DEGREES)	DON B e	DENSITY AP	אינים וי ערבים יי	DIFEL I	TELATIVE PARLTRATION	101A	65.45	<b>BENSHINITY</b>	ואסענגא) כיענסאייניוני אעני	HI MEA	TOPOGRAPHY
						×	>	7		10						042	574	41.8	21.4	
S-89	29 40.12	98 12.46	SC	20	20 Kep	8'0	4	4 N-S	S-1	6838	N. Section	0	100	25	45	100 mg	×		×	FLOODPLAIN
S-70	=0	98 12.43	SC	20	20 Kep	1.5	0.8	2.5 N58E	158E	10		U	O/F	15	45	TO COLUMN	×	125	施	STREAMBED
S-71	100	98 12.42	SF	20	20 Kep	18	0.3	0.3 0.5 NB0E	180E		2	0.25 O/F	J/E	25	45	No.	×	200	量	STREAMBED
S-72	100	98 12.55	Z-C	30	30 Kep	5	1	4	4 N30E			O	O/F	25	55		×		×	CLIFF
S-73	Mil	98 12.8	Z-CD	30	30 Kep	300	20	ΨŲ.	9 N50E	10		Z	NC	30	09	No.	×	STATE OF THE PERSON NAMED IN	擴	STREAMBED
S-74	29 41.26	98 12.88	F	20	20 Kep	2400		100	N40E	10	A STATE OF	O	C/F	15-20	45	No.	×	No.	×	STREAMBED
S-75		98 12.92	0-Z	30	30 Kep	30	80		N-S			O	0/0	8	38 X	×			×	STREAMBED
S-76		98 12.93	SC	20	20 Kep	0.7	0.7		1.5 N30W			Z	H/N	15	35 X	×		×	_	HILLTOP
S-77	29 40.98	98 12.93	CD	5	5 Kep	150	40		3 N40W			L		10	15 X	×			×	STREAMBED
8-78	29 41.14	98 13.15	Z-SC	30	Kep	1	7	0.7 N45E	145E	10	100	O	NO	10	20	関係の	×	To the same of	×	STREAMBED
S-79	29 41.13	98 13.19	SF	20	20 Kep	4	0.4		1.5 N80W		-	0	O/F	10	30 X	×		×	-	HILLTOP
S-80	29 40.98	98 13.24	9	5	5 Kep	8	9	0.5 N57W	157W			0		8	13 X	×		×	Ī	HILLTOP
S-81	29 40.99	98 13.22	SC	20	20 Kep	0.5	0.7	2 1	2 N77E			0	_	13	33 X	×		×	Ī	HILLTOP
S-82	29 41.03	98 13.11	O-FR	5	5 Kep	40	18		N45E	10	-	0	O/F	6	24 X	×			×	STREAMBED
S-83	29 40.82	98 13.21	MB-W	30	30 Kep	0.5		0.5 >50	Section 1	in the		Z	THE REAL PROPERTY.	40	02	The state of	×	×		HILLTOP
S-84	29 41.33	98 13.52	SC	20	20 Kep	3	4		3 N60W			0	-	11	31 X	×		×		HILLTOP
S-85	29 41.29	98 13.46	SF	50	20 Kep	2	0.3	1.5 N46E	146E	10		0		8	38 X	×		×		HILLTOP
. DATU	DATUM: NAD 83																			
2A TYPE	ñ	TYPE		28 F	2B POINTS						8A	8A INFILLING	ñ							
ပ	Cave				30		z	None, e	None, exposed bedrack	×										a
SC	Solution cavity	<u>u</u> .			8		o	Coorse	Coarse - cobbles, braakdown, sand, gravel	kdown,	sand, g	ravel								
SF	Solution-enlarged fracture(s)	ted fracture(s)			2		0	Loose	Loose or soft mud or soil, organics, leaves, slicks, dark colors	oll, orga	intes, lea	ives, slic	ks, dark	colors						
ш	Fault				20		L	Fines, c	Fines, compacted clay-rich sediment, soil profile, gray or red colors	rich se	diment,	soil profil	o, gray	or red colors						
0	Other natural b	Other natural bedrock features			5		>	Vegeta	Vegetation. Give details in narrative description	s in nar	rative de	scription								
MB	Manmade feature in bedrock	ure in bedrock			30		FS	Flowsto	Flowstone, cemants, cave deposits	ave de	silso									
SW	Swallow hole				30		×	Othern	Other materials							3				
HS	Sinkhole				8														6	
CD	Non-karst closed depression	ed depression			S					12 TO	12 TOPOGRAPHY	РНҮ								
2	Zone, clustered	Zone, clustered or aligned features	res		30		CIH.	Hilltop,	Cliff, Hilltop, Hillslde, Drainage, Floodplain, Streambed	38, Flor	dplain, \$	Streambe	p							
						30														

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OF THE WATERWAY

SERIOSY 5321

ö	OGIC ASS	GEOLOGIC ASSESSMENT TABLE	TABL	ш			PRC	)JEC	PROJECT NAME:											=
ll l	LOCATION	NC					FEA	TURE	FEATURE CHARACTERISTICS	FRIS	TICS			Н	EVALUATION	ATION	Ь	HYSIC	PHYSICAL SETTING	
41	18.	10.	82	28	r		,		5	5A	•	7 E	EA 88		6	10	11	_	12	_
FATURE (D	LATHUDE	гомоцлов	FEATURE	POMITS	FORMATION	DALIE	DALIENSIQUE (FEET)		THEND (DECREES)	DOT!	MOSTY APE	APERTURE INF	MFRL RELATIVE MFR.TRATION		TOTAL	ENGITMIY	CATCHMENT AREA (ACRES)	ES)	TOPOGRAPIN	_
						×	>	z		0					970	740	21>	21.6		_
S-86	29 41.5	98 13.68	SF	20	20 Kep	2	0.2	1 NE	N55W	H		0		8	28 X		×	Ť	HILLTOP	_
S-87	29 41.51	98 13.7	SF	20	20 Kep	4	-	2 N39W	M6	$\vdash$		0		8	28 X		×	_	HILLTOP	_
S-88	29 41.49	98 13.82	O-FR	5	5 Kep	40	25	1 N45E		10		0/0	O	15	30 X			×	STREAMBED	_
S-89	29 41.53	98 13.73	CD	5	5 Kep	9	4	0.7 N-S	S			0		8	13 X			×	STREAMBED	_
S-90	29 41.69	98 13.45	MB-W	30	30 Kep		Г	WELL	ELL			×		2	35 X		×		HILLTOP	_
S-91	29 41.64	98 13.38	SF	20	20 Kep	3.5	2	2 E-W	^			O/F	1	18	38 X		×	_	HILLTOP	_
S-92	29 41.56	98 13.5	SC	20	20 Kep	1.5	0.5	2.5 N70W	wo.			0		13	33 X		×	_	HILLTOP	_
S-93	29 41.56	98 13.52	SC	20	20 Kep	3	-	1 N-S	S			O/F	Ir.	7	27 X		×	_	HILLTOP	_
S-94	29 41.63	98 13.38	SF	20	20 Kep	3.5	0.4	1.8 N20W	MO			0		7	27 X		X	_	HILLTOP	_
S-95	29 41.63	98 13.41	SF	20	20 Kep	0.4	3	1.7 N70E	.0E			0		11	31 X		×	_	HILLTOP	_
96-S	29 41.66	98 13.86	SC	20	20 Kep	1.3	1	2.5 N10E	0E			0		13	33 X		×	_	HILLTOP	_
S-97	29 41.65	98 13.88	SH	20	20 Kep	4.5	3	2.5 N50E		10		C	(a) (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	6	39 X		X	1	HILLTOP	_
S-98	29 41.58	98 13.92	SC	20	20 Kep	1	-	3.5 N-S	S			0		13	33 X		×	_	HILLTOP	_
66-S	29 41.77	98 13.48	CD	5	5 Kep	2	3	3 0.9 N-S	S		-	0		5	10 X		×	_	HILLTOP	_
0	S-100 29 41.77	98.13.5	SH	20	20 Kep	20	15	3 N60E	30E	10		O/F	2	20	20	×	×		HLLTOP	
1	S-101 29 41.82	98 13.57	СО	5	5 Kep	40	10	10 0.9 N50E		10		ပ		5	20 X		×	_	HILLTOP	_
12	S-102 29 40:18	98 12.61	DS-Z	30	30 Kep	300 70	70	8 N-S	S			C/N		32		×		SX	STREAMBED	
										۱										11

Solution-enlarged fracture(s) Fault Other natural bedrock features Manmade feature in bedrock Swallow hole Sinkhole Non-karst closed depression Zone, clustered or aligned features
Cave Solution cavity Solution-eniarged fracture(s) Fault Other natural bedrock featur Manmade feature in bedrock Swallow hole Sinkhole Non-karst closed depression Zone, clustered or aligned fe

12 TOPOGRAPHY
CIIIT, HIIItop, Hillside, Drainage, Floodpiain, Streambed

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TCEQ-0585-Table (Rev. 10-01-04)

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Sheet 6 of 7

GEO	GEOLOGIC ASSESSMENT TABLE	SESSMEN.	T TABL	щ			PRC	)JE(	PROJECT NAME:											
	LOCATION	ON					FEA	TUR	FEATURE CHARACTERISTICS	ERIS	TICS				EV	EVALUATION	NOI	_	HYSI	PHYSICAL SETTING
₹	18.	تَ	2,4	28	6	L	٠.		s	¥		7	\$	88	6		0		=	12
FEATURE ID	D LATTIVDE	LONGHUDE	FEATURE	PORTE	FORMATION		DIVERSIONS (FEET)	ED.	THEIR (DEGRECS)	204	DEFIGURY A	APERTURE IFEET)	BITILL	RELATIVE DIFILTRATION	TOTAL	• EN:	*ENTATIVITY	CATCHU	CATCHUENT AREA (ACRES)	TOPOGRAPHY
						×	>	2		10					100000000000000000000000000000000000000	40	240	41.0	215	
S-103	29 40.68	98 12.75	SH	20	20 Kep	7	7	0.5				Ť	O/F	15	35 X	×		×		HILLTOP
S-104	S-104 29 39.97	98 12.77	9	"	5 Kep	55	20	3	3 NW-SE			Ī	0	15		×			×	STREAMBED
S-105	S-105 29 39.94	98 12.72	9	-	5 Kep	18	10	-	1 E-W			Ť	O	15	20 X	×			×	STREAMBED
S-106	S-106 29 40.13	98 12.42	CD	۵,	5 Kep	15	10		0.9 N50W			Ť	U	15		×			×	STREAMBED
S-107	29 40.14	98 12.37	S	-	5 Kep	20	18	6	3 N30W			Ť	S	15	20 X	×			×	STREAMBED
S-108	29 41.94	98 13.4	CD	,	5 Kep	250	13	-	1 N50E	10		_	ш	5	20 X	×		×		HILLTOP
S-109	29 40.40	98 12.66	8	",	5 Kep	35	6	-		-		_	ш	6	14	14 X		×		HILLTOP
								Γ				T	T				L	L	L	
								T												
								T		-	T		T			L			L	
9 3																		Ц		
								1		+	+	1	$\dagger$					4		
			1		$\downarrow$			†		+	+	†	†					1		
								T		+			T					1		
TAG.	* DATIMANADAS																			
2A TYPE	F. 1000	TYPE		1	28 POINTS	75					AB	BA INFILLING	SN							
U	Cave	1		MIN.	30		z	None.	None, exposed bedrock	<i>ى</i> د										
SC	Solution cavity				20	-	ပ	Coarse	Coarse - cobbles, breakdown, sand, gravel	kdowm,	sand, c	ravel								
T.S	Solution-enlarged fracture(s)	ed fracture(s)			20	_	0	9500	Loose or soft mud or soft, organics, leaves, sticks, dark colors	oll. org	anics, lo	aves, sti	cks, dar	'k colors						
L	Fault				20			Fines,	Fines, compacted clay-rich sediment, soil proffle, gray or red colors	dch se	dimen!	soll prof.	Re, gray	or red colors						
0	Other natural b	Other natural bedrock features			S	10	>	Vegeta	Vegetation. Give details in narrative description	s in nar	ralive d	escription	_							
MB	Manmade feature in bedrock	ure in bedrock			30	-	FS	Flowst	Flowstone, cements, cave deposits	ave de	posits									
SW	Swallow hole				30	_	×	Other	Other materials											
HS.	Sinkhole				20	Г														
CO	Non-karst closed depression	ed depression			2	T.				12.70	12 TOPOGRAPHY	<b>YPHY</b>	h.							
2	Zone, clustered	Zone, clustered or aligned features	res		30	-	CIII.	fillop,	CIIII, Hillop, Hillside, Drainage, Floodplain, Streambed	re, Floc	dplain,	Streamb	pad							
						1														

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

TCEQ-0585-Table (Rev. 10-01-04)

\* \* \*

# ATTACHMENT B Soil Profile and Narrative of Soil Units

Twelve soils are present on the subject property. However, only five are present over the area assessed as part of this project. The five soil types in the assessment area are: Eckrant – Rock Outcrop (ErG), Rumple-Comfort Association (RUD), Purves Clay (PuC), Comfort Rock Outcrop (CrD) and the Medlin-Eckrant Association (MED).

# 1) Eckrant-Rock (ErG) – 8 to 30 percent slopes

This soil is very dark gray, extremely stony and about 10" thick. It is about 35%cobbles and stones in the upper part and 75% stones in the lower part

The underlying material is indurated, fractured limestone.

Eckrant slopes are convex. The mapped areas consist of long, narrow slopes on high hills and ridges and along escarpments. This soil is well drained and surface runoff is rapid. Permeability is moderately slow and the available water capacity is very low. Water erosion is a severe hazard.

# 2) Purves Clay (PuC) – 1 to 5 percent slopes

This is a shallow gently sloping soil on uplands. Typically, the unit dark gray and is typically 45" thick. The lower layer is approximately 10% coarse limestone

The underlaying material is a indurated and fractured limestone.

This soil is well drained and surface runoff is medium. Permeability is moderately slow with a shallow root zone. The water capacity is very low and water erosion is a moderate hazard.

# Comfort-Rock (CrD) - complex and undulating

The surface layer is a dark brown and extremely stony clay and about 6" thick. Cobbles and stones as much as 4' across cover about 45% of the surface. The sub-

The underlying material is undurated, fractured limestone. The soil is mildly alkaline and noncalcareous throughout.

The soils are well drained and surface runoff is low to medium. Permeability is slow and the available water capacity is very low. The root zone is shallow and water erosion is a slight hazard.

# 4) Medlin-Eckrant Association (MED) – 1 to 8 percent slopes

The Medlin soil is on slightly concave slopes and the Eckrant soil is on convex slopes. A typical area is 50% Medlin soil and 30% Eckrant soil.

The Medlin soils can be up to 80" thick and are good for rangeland use. The Eckrant soils are typically 17" deep and are not suited for crops but are for rangeland.

The Medlin soil is well drained and surface runoff is rapid. Permeability is very slow and water enters rapidly when the soil is cracked and dry but slowly when wet. The rooting zone is deep but the clay impedes root development thus creating a severe water erosion hazard. The Eckrant soil is well drained and surface runoff is rapid. Permeability is moderately slow and the available water capacity is very low. Water erosion is a severe hazard.

# 5) Rumple –Comfort Association (RUD) – undulating 1 to 8 percent slopes

Rumple soil makes up anout 60% and the Comfort soil comprises about 20% of the unit. Slopes are plane or convex.

The Rumple interval is very stony and about 28" thick cherty loam with limestone. The underlying unit is indurated limestone fragments. The Comfort soil is an extremely stony clay and is underlain by indurated, fractured limestone.

This Comfort soil is dark brown and dark reddish brown that is mildly alkaline. Both soils are well drained and surface runoff is medium. However, runoff from large areas is much slower than from local areas because some of the water enters caves, sinkholes, rock crevices and streambeds. Permeability is moderately slow in the Rumple and slow in the Comfort. The available water capacity is very low for both. The rooting zone is shallow in the Comfort and moderately deep in the Rumple. Water erosion is moderate for both.

The Anhalt Clay (AnB), Branyon Clay (ByA), Bolar Clay Loam (BrB), Branyon Clay (ByB), Heiden Clay (HeB), Heiden Gravelly Clay (HGD), Houston Black Gravelly Clay (HvB), Krum Clay (KrB), and Orif Soils frequently flooded (Or) and Sunev Clay Loam (SuB) have also been mapped at the project site. However these soils are present over the Transition Zone and were not assessed during this project.

# Attachment C Stratigraphic Column

System	Series	Group	Formation	Member	Thickness (feet)	Lithology	Field ID
		ta		Buda	40-50	Buff, light gray dense mudstone	Porcelaneous limestone with calcite-filled veins
		Washita		Del Rio	40-50	Blue green to yellow brown clay	Marker fossil: <i>Ilmatogyra</i> arietna
				Georgetown	2-20	Reddish brown, gray to light tan marly limestone	Marker fossil: Waconella wacoensis
				Cyclic & Marine Members undivided	80-90	Mudstone to packstone; miliolid grainstone; chert	Thin graded cycles; massive beds to relatively thin beds; cross-bedding
	an		Person	Leached & Collapsed Members undivided	70-90	Crystalline limestone; mudstone to grainstone; chert; collapsed breccia	Bioturbated iron-stained beds separated by massive limestone beds; stromatolitic limestone
	Comanchean	(S)		Regional Dense Member	20-24	Dense; argillaceous mudstone	Wispy iron oxide stains
	Comi	Fredricksburg (Edwards)		Grainstone Member	50-60	Miliolid grainstone; mudstone to wackestone; chert	White cross-bedded grainstone
		Fredricksbu		Kirschberg Evaporite Member	50-60	Highly altered crystalline limestone; chalky mudstone; chert	Boxwork voids, with neospar and travertine frame
			Kainer	Dolomitic Member	110-130	Mudstone to grainstone; crystalline limestone; chert	Massively bedded light gray, <i>Toucasia</i> abundant
				Basal Nodular Member	50-60	Shaly, nodular limestone; mudstone and miliolid grainstone	Massive, nodular and mottled, Exogyra texana

#### ATTACHMENT D

# Geologic Narrative

#### Overview:

The site consists of approximately 1015 acres located seven miles southwest of New Braunfels, Texas. The geologic assessment was performed over the entire site. One hundred and nine (109) features were identified and mapped during this investigation. Nineteen (19) of the 109 mapped features were classified as sensitive in accordance with the "Instructions for Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones" (TNRCC-0585-Instructions (Rev. 10-1-04)). The sensitive features are; two (2) caves, two (2) solution cavities, three (3) sink holes, one (1) solution enlarged fracture, two (2) faults, two (2) man-made features in bedrock and seven (7) zones of various types.

#### Field Work:

Field work was performed at the site on October 31, November 1, 2, 7, 9, 13, 15, 20, 21, 27, 28 and 29, 2006 by Westward field personnel consisting of two registered Professional Geologists and two field technicians. Field transects were walked across the site using a 50-foot spacing. In areas of dense vegetative cover, historic site clearing, grubbing and earth moving activities, geologic or manmade features may have been altered or obscured at the time of site visit. Several areas of recent clearing across the southern portion of the site had created very large piles of cut vegetation that were scattered throughout the clearing route. These piles obscured the surface at the time of this assessment.

Geologic and manmade features were field logged, and GPS coordinates were collected for each feature. GPS data are included on the Geologic Assessment Table.

# Stratigraphy:

The Person Formation (Kep) of the Edwards Group, which is Lower Cretaceous in age, is the predominantly exposed geologic unit at the surface across the site. However, the Buda Limestone (Kbu), Del Rio Clay (Kdr) and Georgetown Formation (Kgt) are also mapped at the surface in the northern portion of the site. Attachment E shows the stratigraphic relationships and characteristics of the outcropping rocks and other subsurface units.

#### Structure:

The subject property is located in the Balcones Fault Zone, approximately seven to eight miles southwest of the Comal Springs. Several faults, and evidence of faulting, were observed on site during this assessment. The Geologic Atlas of Texas, San Antonio Sheet, also shows numerous faults and fault blocks across the site. The average fault

trend in this section of the Balcones Fault Zone is approximately N50E. Features trending from N35E to N65E were assigned the extra 10 points for being aligned in the dominant fault trend direction.

#### Karstic characteristics:

Sixty six (66) possible karst features were identified onsite during this assessment. A summary of features identified is as follows: two (2) caves, one (1) cave zone, thirty (30) solution cavities, four (4) solution cavity zones, eleven (11) sinkholes, sixteen (16) solution enlarged fractures, two (2) other features that could potentially be karst. A total of one hundred and seven (107) geologic and manmade features were logged in Attachment B, the Geologic Assessment Table.

# Geologic and Manmade features are described below.

#### Caves

# S-29, S-36: Sensitive

Three caves were identified during this assessment. S-29 occurs in the floodplain above the streambed. There was evidence of downward movement of water through this feature which ranked it as sensitive. Because the entrance to this cave is approximately four feet above the creek bed, it was assessed to have an intermediate infiltration rate. S-36 occurs on a hill top on the southwestern portion of the property. The cave extends downward vertically from the surface for approximately eight feet before turning in a more horizontal direction. Relative infiltration rate is high.

#### Cave Zone

#### S-72: Sensitive

S-72 appears to be a zone of caves with the floors sloping outward that are located in the cliff wall above the streambed on the eastern portion of the site. The openings are plugged with organic and fine-grained material. The relative infiltration rate is intermediate.

#### Closed Depressions

# S-2, S-3, S-12, S-16, S-18, S-22, S-27, S-46, S-54, S-67, S-77, S-80, S-99, S-108 and S-109: Not Sensitive

These features are non-karst closed depressions are infilled with either organic or fine grained materials. S-2 and S-3 are large depressions caused by the presence of an elevated road and railroad tracks. S-16 is a large excavation/quarry area that has some fine grained sediment at the lowest part of the depression and appears to hold water. S-108 is large stock pond located in the extreme northeastern corner that was holding water at the time of mapping. Due to lack of evidence to suggest karst involvement, observed ability to hold water and amount of sediment observed, these features have a low to very low probability of rapid infiltration.

# S-6, S-14, S-18, S-28, S-63, S-89, S-104, S-105, S-106 and S-107: Not Sensitive

These features are believed to be non-karst in origin that occur in streambeds presumably caused by change in stream load distribution due to obstructions such as downed trees and roads. These features are filled with coarse gravel and cobbles with bedrock visible in many places. Tilted bedrock was not observed in the feature to possibly indicate any connection to structural or karst activity. Probability of rapid infiltration is low.

# Other Features

# Vuggy Rock Outcrops

#### S-1 and S-47: Not Sensitive

S-1 is a vuggy rock outcrop located in a streambed near the southern property line. The vugs were infilled with fine soil particles and are up to 1.5" in diameter. The amount of exposed bedrock here is minimal. Based on this, the probability of rapid infiltration was deemed to be low. S-47 is classified as a vuggy rock outcrop. The aperture is less than 1" on average and the vugs are filled with fine-grained sediment.

#### Fractured Rock Outcrops:

#### S-75, S-82 and S-88: Not Sensitive

S-75 is a zone of other features that occur in the streambed in the vicinity of fault S-74. Fractures are observed to be the dominant feature in this zone and are not in the dominant trend direction. Probability of rapid infiltration is low. S-82 is an area with fractures that are in the dominant trend direction. The location of this area is in a streambed near the fault S-74. It is anticipated that the fractures are the result of movement along the fault and occur in level bedrock. Probability of rapid infiltration is low. S-88 is a fractured rock outcrop that does follow the dominant trend and has organic and coarse materials as infilling. The probability of rapid infiltration is low.

#### Solution Cavities

S-8, S-15, S-19, S-20, S-24, S-26, S-30, S-31, S-33, S-35, S-37, S-38, S-39, S-42, S-43, S-45, S-48, S-51, S-55, S-58, S-62, S-76, S-81, S-84, S-92, S-93, S-96 and S-98:

# Not Sensitive

Solution cavities were the most frequent feature observed during this assessment with 30 being identified as site features. The features listed above were not classified as sensitive due to the presence of organic and fine-grained sediment in the cavity in addition to surrounding soil cover. Some features also have evidence of animal burrowing activity. Based on the amount of fine-grained sediment located in and around the cavities, in addition to some evidence of animal burrowing activity, the probability of rapid infiltration is low.

S-26 and S-35 occur at the bottom of a rock cliff above the streambed but do not appear to extend downward vertically and contains organic as well as fine-grained sediment. S-51 and S-62 appear to have been caused by stream scour. Both are horizontal in nature with no observable vertical component, and are located above the existing the streambed. Based on the absence of a vertical component and the location above the streambed, the probability of rapid infiltration is low.

## S-23, S-69 and S-70: Sensitive

These solution cavities were rated as sensitive features. S-23 is a small cavity located on a hill top but does not have any observable infilling. Although this area does not receive much runoff due to its topographic position, any water received would have a moderate to high infiltration rate unless there is a blockage further down in the cavity that could not be seen. S-69 and S-70 occur in a rock wall above the streambed and are infilled with organics and fine-grained sediment. Based on their location, lack of horizontal development, these features have a moderate probability of rapid infiltration.

#### Sinkholes

# S-9, S-10, S-11, S-25, S-61, S-65, S-97 and S-103: Not Sensitive

These features are sinkholes that were identified during this assessment. S-9, S-10 and S-11 occur within close proximity to each other and do line up in the dominant trend direction. S-10 is located approximately 100' southwest of S-9 and S-11. The features are filled with fine-grained sediment and organic material. S-97 has fine-grained sediment and vegetation growing from the center of the feature. The probability of rapid infiltration is low.

# S-21, S-60, and S-100: Sensitive

S-21 is a large sinkhole that follows the dominant fault trend. The opening is obscured with large boulders that have algae/moss present on the top portion of the rocks. This could possibly indicate movement of warm moist air across this feature. Algae/moss was not observed anywhere else in the immediate vicinity. After removal of several rocks, the view was still obscured with larger rocks. This feature may be a collapsed cave. The probability of rapid infiltration is high. S-60 occurs on a hill top and the view down into the feature was obscured with large rocks. The probability of rapid infiltration is intermediate. S-100 is a large sinkhole area that has a dominant trend. The deepest portion was observed to approximately 3' with obscured views in some portions. Algae was observed growing on the surface rocks inside the feature. The probability of rapid infiltration is low to intermediate.

# Solutioned Enlarged Fractures

S-17, S-32, S-40, S-41, S-56, S-59, S-68, S-72, S-79, S-85, S-86, S-87, S-91, S-94, and S-95: Not Sensitive

These features were observed in various areas across the site. Infilling is fine-grained sediment and trees were observed growing in many of the fractures.

#### S-71: Sensitive

S-71 occurs in a stream bed with little observed infilling. Additionally, the bedrock where the feature was identified appears to dipping at an angle. Probability of rapid infiltration is intermediate.

#### **Faults**

S-5: Not Sensitive

S-5 is the main fault that goes across the southern portion of the site. The fault scarp is comprised of weathered materials and bedrock. Probability of rapid infiltration is low.

#### S-52, S-74: Sensitive

S-52 appears to be part of a horst-graben sequence and does follow the dominant trend. Bedrock outcrops dip away from each other on either side of the CD zone that is feature S-53. Probability of rapid infiltration along these faults appears to be low. S-74 is very pronounced fault that follows the dominant trend. The bedrock is fractured at the contact and appears to be the cause of the streambed that runs parallel to the fault. There is up to 60' of topographic relief from the northern side of the fault down to the streambed. Probability of rapid infiltration is low to intermediate.

There are two faults located in the far northern portion of the site that has been mapped by the Bureau of Economic Geology (BEG) on the Geologic Atlas of Texas, San Antonio Sheet. However, these faults were not readily identifiable in the field and are dotted as discussed in the F-0585 Geologic Assessment Instructions. These faults were not assigned a site feature number.

# Man Made Features

#### S-4, S-7, S-34, S-44 and S-90: Not Sensitive

These features are water wells. S-4, S-7 and S-90 are domestic water wells that are enclosed and are finished on concrete pads. S-34 and S-44 are monitoring wells that have a three foot steel box riser and appear to be sealed with grout/concrete at the surface. The probability of rapid infiltration is low.

#### S-57 and S-83: Sensitive

S-57 appears to be a boring that was not plugged. It is approximately 9" in diameter and the depth is unknown. The view was obscured by a possible sediment bridge. The probability of rapid infiltration is high. S-83 is a water well that is uncapped and open at the surface. Water is present in the well but it is not known what the static level of the groundwater is. The probability of rapid infiltration is high.

# Zone - Closed Depression

# S-13: Not Sensitive

S-13 covers a large area of approximately 200' x 300' on a hilltop. However, vertical soil sapping to a depth of approximately 8" was observed in the center of one depression. This may indicate karst activity in the subsurface. But due to the amount of fine-grained sediment observed and vegetation present, the probability of rapid infiltration was rated low.

#### S-53 and S-73: Sensitive

S-53 is the graben area between two faults that has numerous close depressions that are aligned parallel to the faults and is also in the dominant trend. The features are filled with fine-grained sediment with some depressions up to 4 ft deep possibly indicating soil sapping in the subsurface. Evidence of ponding water was observed. The probability of rapid infiltration is low. S-73 is a series of closed depressions in a streambed presumably caused by change in stream load distribution due to obstructions such as downed trees.

However, the features are also associated with a fault in the vicinity and are oriented in the dominant trend direction. Although fine grained sediment was not observed in the features, the relative infiltration rate is still assessed as low. The fact that the feature has dominant orientation and is classified as a zone, the sensitivity rating is elevated.

#### Zone – Solution Cavities

#### S-49: Not Sensitive

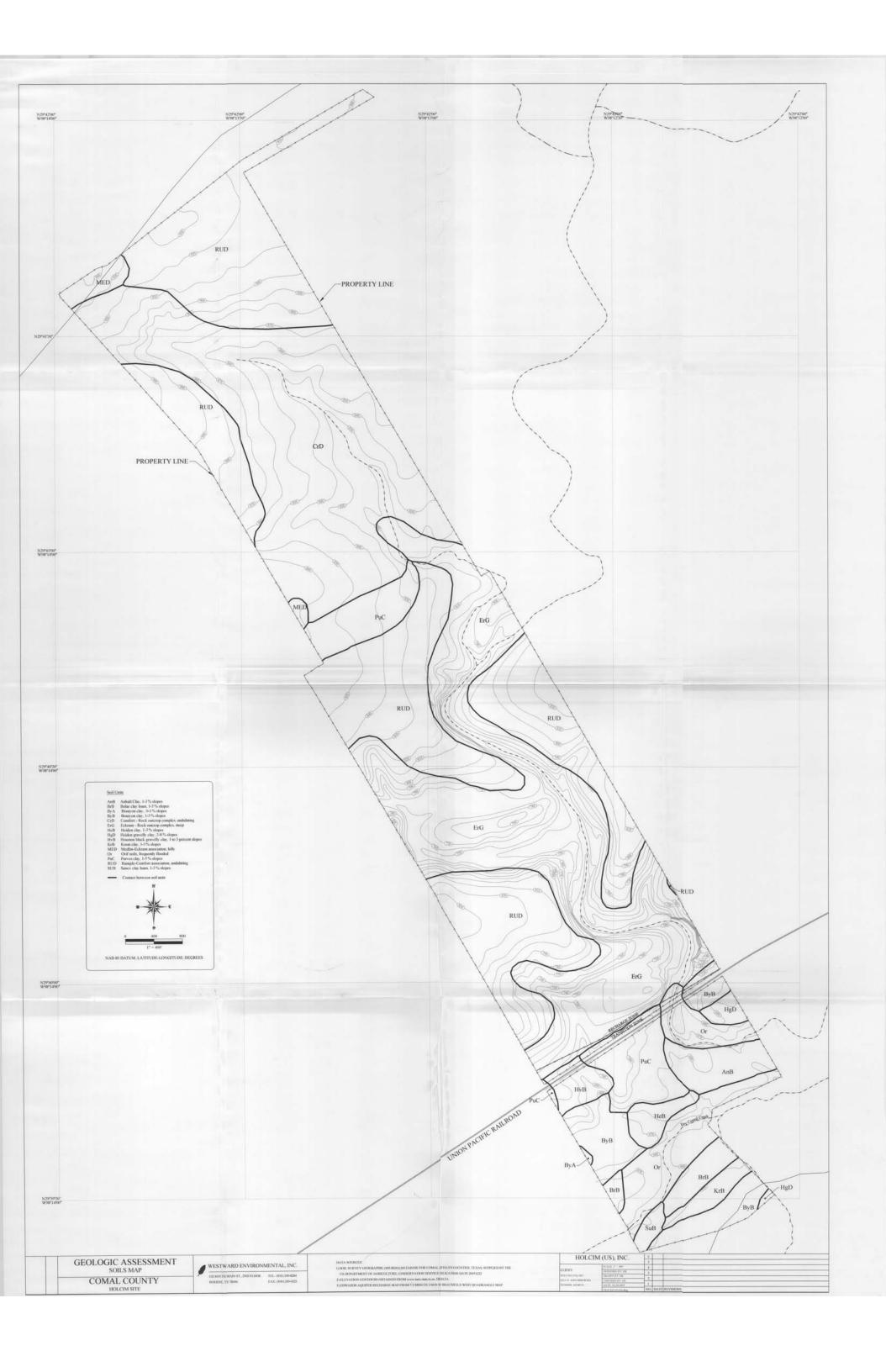
S-49 is a 20' long area of solution cavities along the hilltop. The cavities do not appear to be oriented downward but more horizontally and upward. The probability of rapid infiltration is low.

# S-50, S-64, S-78 and S-102: Sensitive

S-50 was rated slightly sensitive but the cavities are infilled with fine-grained sediment and organic material. The probability of rapid infiltration is low. S-64 is a zone approximately 100 ft by 300 ft with organic and coarse materials for infilling. This feature is also located in a streambed. The probability of rapid infiltration is low to intermediate. S-78 occurs in a streambed also and follows the dominant trend. The infilling is organic materials where visible. The probability of rapid infiltration is low.

S-102 is a large area located in a streambed. In addition to numerous solution cavities, there are other features such as closed depressions and solutioned enlarged fractures also in this zone. Bedrock is dipping in various locations and there is very minimal stream debris. The depth of some of the depressions is up to 8 ft. The probability of rapid infiltration is high.





# Geologic Assessment Form (TCEQ-0585) Supplemental Information

Based on discussions with TCEQ staff, form TCEQ-0585, Geologic Assessment, is not required for this WPAP modification request because the original Geologic Assessment approved with the original WPAP provides the necessary information. The original submittal for the Geologic Assessment form TCEQ-0585 (signed by Thomas O. Mathews II, P.G., for Westward Environmental, Inc. on 3 April 2007) is provided for reference. In addition, the Geologic Assessment was modified with the 2015 WPAP modification approved on 6 May 2015. The updated Geologic Assessment Table was signed by Thomas O. Mathews II, P.G., on 4 February 2015 and is provided for reference. Modifications to the Geologic Assessment form beyond the original Geologic Assessment and updated Geologic Assessment are not proposed as part of this WPAP modification request.

Multiple geologic features were identified near the areas associated with this WPAP modification request. However, this WPAP modification request does not propose to modify the approved protection methods and/or removal of geologic features. In accordance with the previously approved WPAP modification, sensitive features will be protected by the use of silt fences, rock berms, and earthen berms and flow to naturally occurring sensitive features will be maintained to the maximum extent possible. Because the approved land use calls for the removal, by excavation, of the sensitive features within the quarry limits, no permanent sealing of features is requested herein. However, in order to protect water quality during quarrying activities, sensitive features that lie within the approved quarry area will be temporarily sealed prior to their excavation as described in the previously approved WPAP modification.

# <u>Attachment A – Geologic Assessment Table</u>

The Geologic Assessment Table from the original approved WPAP and the approved 2015 WPAP modification will not be modified as a result of this WPAP modification request. The original Geologic Assessment Table and updated Geologic Assessment Table from the 2015 WPAP modification are provided for reference.

#### <u>Attachment B – Stratigraphic Column</u>

The original Geologic Assessment approved with the WPAP provides information on the stratigraphic column. Modified information is not required for this WPAP modification request.

# <u>Attachment C – Site Geology</u>

The original Geologic Assessment approved with the WPAP provides information on the site geology. Modified information is not required for this WPAP modification request.

# <u>Attachment D – Site Geologic Map(s)</u>

The original Geologic Assessment approved with the WPAP provides the Site Geologic Maps. Modified information is not required for this WPAP modification request.

# **UPDATED GA TABLES**

LOCATION   LOCATION	GEOL	GEOLOGIC ASSESSMENT TABLE	ESSMENT	TABL	ш			PR	STEC	PROJECT NAME:			0							Si I	
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29 39.85         98 12.59         O-VR         5 Kep         20         3         N14W         10         7         1         36 X         40         41         36 X         7         12 X	FEATURE ID		LONGITUDE	FEATURE	POINTS	FORMATION	DIMEN	SHOKS (1	_	REND (DEGREES)				_	RELATIVE INFILTRATION RATE	TOTAL	_	SHSITIVITY	AREA AREA	(ADRES)	
29 39.86         98 12.59         COVR         5 Kep         20         3 N17E         0         11         36 X         X           29 39.84         98 12.59         CD         5 Kep         30         7         3 N17E         0         7         12 X         X           29 39.85         98 12.57         CD         5 Kep         7         10 0.7 N24W         0         9         14 X         X           29 39.88         98 12.56         MB-W         30 Kep         N60E         10 N10E         X         5         35 X         X         X           29 39.99         98 12.36         CD         5 Kep         80 200         10 N10E         X         5         35 X         X         X           29 39.99         98 12.34         F         20 Kep         NEL         NEL         X         5         35 X         X         X           29 39.96         98 12.46         SH         20 Kep         1 1 1.5 N30W         F/O         9         35 X         X         X           29 39.96         98 12.46         SH         20 Kep         4 6 1.5 N36E         10         NC         9         35 X         X         X							×	>	Z		5						440	_	Н	$\vdash$	
29 39.84         98 12.59         CD         5 Kep         7 10 0.7 N24W         0         7 12 X         X           29 39.85         98 12.57         CD         5 Kep         7 10 0.7 N24W         0         9         14 X         X           29 39.88         98 12.56         MB-W         30 Kep         NOC         10         NOC         7         37 X         X           29 39.99         98 12.36         CD         5 Kep         80 200         10 N10E         NOC         10         15 X         X         X           29 39.99         98 12.36         MB-W         30 Kep         1         1 1.5 N30W         NOC         9         35 X         X         X           29 39.96         98 12.46         SH         20 Kep         4         6 1.5 N30W         PC         10         15 X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X	S-1	29 39.85	98 12.59	O-VR	5	Kep	20	8	Z	14W	Г		0		11		X 9	_		×	STREAMBED
29 39.85         98 12.57         CD         5 Kep         7 10 0.7 N24W         0         9         14 X         X         X           29 39.88         98 12.56         MB-W         30 Kep         200         NELL         X         5 35 X         X         X           29 39.92         98 12.44         F         20 Kep         200         10 N10E         C         7 37 X         X         X           29 39.92         98 12.36         CD         5 Kep         80 200         10 N10E         C         10 15 X         X         X         X           29 39.97         98 12.36         MB-W         30 Kep         1 1 1.5 N30W         F/O         15 35 X         X         X           29 39.97         98 12.46         SH         20 Kep         4 6 1.5 N40W         F/O         5 35 X         X         X           29 39.97         98 12.46         SH         20 Kep         4 6 1.5 N40W         F         5 25 X         X         X           29 39.96         98 12.46         SH         20 Kep         4 6 1.5 N40W         F         5 25 X         X         X           29 39.96         98 12.48         SC         20 300 1.5 N40E         10 <t< td=""><td>S-2</td><td>29 39.84</td><td>98 12.59</td><td>CD</td><td>5</td><td>Kep</td><td>30</td><td>7</td><td>e N</td><td>17E</td><td></td><td></td><td>S</td><td></td><td>7</td><td>_</td><td>2 X</td><td></td><td></td><td>×</td><td>STREAMBED</td></t<>	S-2	29 39.84	98 12.59	CD	5	Kep	30	7	e N	17E			S		7	_	2 X			×	STREAMBED
29 39.88         98 12.56         MB-W         30 Kep         NELL         NELL         NC         7         37 X         X         X           29 39.92         98 12.44         F         20 Kep         2900         10 N10E         10         15         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X <td>S-3</td> <td>29 39.85</td> <td>98 12.57</td> <td>8</td> <td>5</td> <td>Kep</td> <td>7</td> <td>10</td> <td>0.7</td> <td>24W</td> <td></td> <td></td> <td>O</td> <td></td> <td>o</td> <td></td> <td>X X</td> <td></td> <td></td> <td>×</td> <td>STREAMBED</td>	S-3	29 39.85	98 12.57	8	5	Kep	7	10	0.7	24W			O		o		X X			×	STREAMBED
29 39.92         98 12.44         F         20 Kep         2900         10 NOE         10         N/C         7 37 X         X         X           29 40         98 12.36         CD         5 Kep         80 200         10 N10E         C         10         15 X         X         X           29 39.97         98 12.36         MB-W         30 Kep         1         1 1.5 N30W         F/O         15         35 X         X         X           29 39.97         98 12.46         SH         20 Kep         4         6 1.5 N56E         10         O/C         9         39 X         X         X           29 39.96         98 12.46         SH         20 Kep         4         6 1.5 N40W         F/O         6         25 X         X         X           29 39.96         98 12.46         SH         20 Kep         4         6 1.5 N40W         F/O         5         25 X         X         X           29 39.96         98 12.48         CD         5 Kep         4         6 1.5 N40E         10         F/O         5         25 X         X         X           29 39.96         98 12.48         CD         5 Kep         4         1 1.0 N0E         F	S-4	29 39.88	98 12.58	MB-W	30	Kep			≤	/ELL			×		S		2 X		×		HILLTOP
29 40         98 12.36         CD         5 Kep         80 200 10 N10E         C         10 15 X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X	8-5	29 39.92	98 12.44	ı	20	Kep	2900		Ž	60E	10		Z	Q	7	3	X Z			×	HILLSIDE
29 39 99         98 12.35         MB-W         30 Kep         1 1.5 N30W         MELL         X         5 35 X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X	8-6	29 40	98 12.36	CD	2	Kep	80	200	10 N	10E			U		10		2 X			×	STREAMBED
29 39.97         98 12.44         SC         20 Kep         1         1.5 N30W         F/O         15         35 X         X           29 39.96         98 12.46         SH         20 Kep         4         6 1.5 N56E         10         O/C         9         39 X         X         X         X           29 39.96         98 12.46         SH         20 Kep         4         6 1.5 N40W         F/O         5         25 X         X         X         X           29 39.96         98 12.45         SH         20 Kep         4         6 1.5 N40E         10         F         5         25 X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X	S-7	29 39.99	98 12.35	MB-W	30	Kep			\$	/ELL			×		S		(2 X		×		FLOODPLAIN
29 39 96         98 12.46         SH         20 Kep         4         6 1.5 N56E         10         O/C         9         39 X         X         X           29 39.97         98 12.46         SH         20 Kep         3 6 0.5 N40W         10         F/O         5 25 X         X         X           29 39.96         98 12.45         SH         20 Kep         4 6 1 N40E         10         F         5 25 X         X         X         X           29 39.96         98 12.45         CD         5 Kep         11 40 1.5 N40E         10         F         5 20 X         X         X         X           29 40.01         98 12.74         CD         5 Kep         11 M12W         C         15 20 X         X         X         X           29 39.96         98 12.74         CD         5 Kep         8 4 1 N12W         C         15 20 X         X         X         X         X           29 39.96         98 12.78         CD         5 Kep         2 1 1.5 N6E         O         10         X         X         X         X         X           29 39.96         98 12.78         CD         5 Kep         2 1 1.5 N6E         O         10         D         X </td <td>8-S</td> <td>29 39.97</td> <td>98 12.44</td> <td>SC</td> <td>20</td> <td>Kep</td> <td>1</td> <td>-</td> <td>1.5 N</td> <td>30W</td> <td></td> <td></td> <td>ш</td> <td>0</td> <td>15</td> <td></td> <td>2 X</td> <td></td> <td>×</td> <td></td> <td>HILLTOP</td>	8-S	29 39.97	98 12.44	SC	20	Kep	1	-	1.5 N	30W			ш	0	15		2 X		×		HILLTOP
29 39.97         98 12.46         SH         20 Kep         3         6         0.5 N40W         F/O         F/O         5         25 X         X         N           29 39.96         98 12.45         SH         20 Kep         4         6         1 N40E         10         F         5         35 X         X         X           29 39.96         98 12.48         CD         5 Kep         11         40 1.5 N40E         10         F         5         20 X         X         X         X           29 40.01         98 12.74         CD         5 Kep         8         4         1 N12W         C         15         20 X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X         X <t< td=""><td>8-9</td><td>29 39.96</td><td>98 12.46</td><td>SH</td><td>20</td><td>Kep</td><td>4</td><td>ဖ</td><td>1.5 N</td><td>56E</td><td>10</td><td></td><td>U</td><td>10/</td><td>σ</td><td></td><td>X 6</td><td>_</td><td>×</td><td></td><td>HILLTOP</td></t<>	8-9	29 39.96	98 12.46	SH	20	Kep	4	ဖ	1.5 N	56E	10		U	10/	σ		X 6	_	×		HILLTOP
29 39 96         98 12.45         SH         20 Kep         4         6         1 N40E         10         F         5         35 X         X         N           29 39 98         98 12.48         CD         5 Kep         11         40         1.5 N40E         10         F         9         20 X         X         N           29 40.01         98 12.74         CD         5 Kep         8         4         1 N12W         C         15         20 X         X         X         N           29 39.96         98 12.74         CD         5 Kep         2         1 1.5 N6E         O         10         30 X         X         X         X           29 39.96         98 12.78         CD         5 Kep         2         1 1.5 N6E         O         10         30 X         X         X         X           29 39.96         98 12.78         CD         5 Kep         20 150         35 N-S         N         7         12 X         X         X         X           29 39.96         98 12.78         CD         5 Kep         20 150         30 10         N         X         X         X         X         X         X           29 39.9	S-10	29 39.97	98 12.46	HS.	20	Kep	က	9	0.5 N	40W		_	4	Q Q	5		,2 X		×		HILLTOP
29 39.98         98 12.48         CD         5 Kep         11 40 1.5 N40E         10         F         5 20 X         X         X           29 40.01         98 12.51         Z-CD         30 Kep         200 300 1.5 N70E         F         9 39 X         X         X           29 39.96         98 12.74         CD         5 Kep         2 1 1.5 N6E         O         10         30 X         X         X           29 39.96         98 12.78         CD         5 Kep         2 1 1.5 N6E         O         10         30 X         X         X           29 39.96         98 12.78         CD         5 Kep         200 150 35 N-S         N         Y         12 X         X         X           29 40.01         98 12.8         SF         20 Kep         4 0.3         2 N80E         O         17 37 X         X         X	S-11	29 39.96	98 12.45	SH	20	Kep	4	9	Z C	40E	10		ш		5		(5 X		×		HILLTOP
29 40.01         98 12.51         Z-CD         30 Kep         200 300 1.5 N70E         F         9         39 X         X         X           29 39.96         98 12.74         CD         5 Kep         8         4         1 N12W         C         15         20 X         X         X           29 39.96         98 12.74         CD         5 Kep         2         1 1.5 N6E         O         10         30 X         X         X           29 39.96         98 12.78         CD         5 Kep         200 150 35 N-S         N         7         12 X         X         X           29 40.01         98 12.8         SF         20 Kep         4 0.3         2 N80E         O         17         37 X         X         X	S-12	29 39.98	98 12.48	9	5	Kep	11	40	1.5 N	40E	10		н		5		ΧO		×		HILLTOP
2939.96         98 12.74         CD         5 Kep         8         4         1 N12W         C         15         20 X         X         X           29 39.96         98 12.81         SC         20 Kep         2         1 1.5 N6E         O         10         30 X         X         X           29 39.98         98 12.78         CD         5 Kep         200 150 35 N-S         N         7         12 X         X         X           29 40.01         98 12.8         SF         20 Kep         4 0.3         2 N80E         O         17         37 X         X         X	S-13	29 40.01	98 12.51	Z-CD	30	Kep	200	300	177	70E			L.		0		X 6		×		HILLTOP
29.39.96         98 12.81         SC         20 Kep         2         1 1.5 N6E         O         O         10         30 X         X         A           29.39.98         98 12.78         CD         5 Kep         200 150         3.5 N-S         N         7         12 X         X         X           29 40.01         98 12.8         SF         20 Kep         4 0.3         2 N80E         O         17         37 X         X         I	S-14	29 39.96	98 12.74	CD	5	Kep	8	4	Z V	12W			U		15		XO			×	STREAMBED
29.39.98         98 12.78         CD         5 Kep         200 150         3.5 N-S         N         N         7         12 X         X         X           29 40.01         98 12.8         SF         20 Kep         4 0.3         2 N80E         0         17         37 X         X         I	S-15	29 39.96	98 12.81	SC	20	Kep	2	7	1.5 N	9E			J		0,		×		×		HILLSIDE
29 40.01 98 12.8 SF 20 Kep 4 0.3 2 N80E   O   17 37 X   X	S-16	29 39.98	98 12.78	CD	5	Kep	200	150	3.5 N	S-			_	_	7		2 X			×	HILLSIDE
	S-17	29 40.01	98 12.8	SF	20	Kep	4	0.3		80E		-	٥		17	(م)	X Z		×		HILLSIDE

	_	z	O	0	LL.	>	ន	×			S
	2B POINTS	30	20	20	20	us.	8	30	20	LO.	30
DATUM: NAD 83	TYPE	Cave	Solution cavity	Solution-enlarged fracture(s)	Fault	Other natural bedrock features	Manmade feature in bedrock	Swallow hole	Sinkhole	Non-karst closed depression	Zone, clustered or aligned features
· DATUM	2A TYPE	O	SC	SF	4	0	MB	SW	HS	00	2

Fines, compacted clay-rich sediment, soil profile, gray or red colors Loose or soft mud or soil, organics, leaves, sticks, dark colors Vegetation, Give details in narrative description Coarse - cobbles, breakdown, sand, gravel 12 TOPOGRAPHY Flowstone, cements, cave deposits None, exposed bedrock Other materials

8A INFILLING

ff, Hillop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a truesconding property proditions observed in the fleid.

THOMASO. MATHEWS Dark

My signature certifies that I am qualified as a geologist as defined at the Control of THOMAS (THOMAS COA)

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TCEQ-0585-Table (Rev. 10-01-04)

GEOL	GEOLOGIC ASSESSMENT TABLE	SESSMEN.	TABL	Щ			4	SOJE	PROJECT NAME:								l			ŀ
	LOCATION	NO						ATU	FEATURE CHARACTERISTICS		STICS				Ä	EVALUATION	NO	ă	HYSIC	PHYSICAL SETTING
ΑL	18.	30*	న	138	8		4		w	æ	60	~	₩.	88	6	10		-		12
FEATURE ID	אַסעידאַט	LONGITUDE	PEATURE	POINTS	S FORMATION		DIMENSIONS (FEET)	S (PEET)	TREND (DEGREES)	DOM	DENSITY A	APERTURE (FEET)	TIGN	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY	ŽĮĮ.	CATCHIMENT AREA (ACREE)	NT AREA	TOPOGRAPHY
						Ĥ	×	2		ā						c40	Я	6,1%	뛻	
S-18	29 40.06	98 12.34	CD		5 Kep		15 1	18 4	4 N10E		-	_	ပ	10	15 X	×			×	STREAMBE
S-19	29 40.04	98 12.53	SC	,	20 Kep		80	1 2	2 N23W				O/F	10	30 X	×		×		HILLSIDE
S-20	29 40.03	98 12.85	SC		20 Kep		15 0.5		1 N16E		_		0	11	31 X	×		×		HILTOP
S-21	29 40.05	98 12.8	SH	. 4	20 Kep		12 22		4 N50E	10			z	40	20		×	×		HILLSIDE
S-22	29 41.1	98 13.43	CO CO	Ц	5 Kep		35 15		2.5 N60W				Ш	7	12 X	×		×		HILLTOP
	29 39.98	98 12.63	SC	. 4	20 Kep	i	0.3 0.2	_	1.3 N50E	10			z	20	20		×			HILLTOP
	29 40.56	98 12.78	သွ	,,,	20 Kep	-	1 0.8	8 2				Ĩ	O	10	30 X	×		×		HILLSIDE
	29 40.1	98 12.44	S.	.,	20 Kep	П		2 4	4 N40E	10	_		N/C	15	45 X	×		×		HILLSIDE
S-26	29 40.11	98 12.49	R	,,4	20 Kep	П	-	3 3.5	3.5 N10W		1	1.3 O/F	J/F	15	35 X	×		×		FLOODPLAI
	29 40.56	98 12.8	00		5 Kep			7 0.5					ш	5	10 X	×		×		HILLTOP
	29 40.14	98 12.57	CD		5 Kep		40 2	0 2.5	20 2.5 N60W			_	ပ	10	15 X	×			×	STREAMBE
8-29	29 40.11	98 12.58	၁		30 Kep		က	5 8	8 N10E				0	25	55		×		×	FLOODPLAI
8-30	29 40.11	98 12.63	SC	. 4	20 Kep		-	4 5	5 N53E	10			O/F	7	37 X	×			×	FLOODPLAI
S-31	29 40.11	98 12.69	SC	, 4	20 Kep		1 1.7		5 N86E				0	10	30 X	×		×		HILLSIDE
S-32	29 40.09	98 12.68	SF	.,	20 Kep		5 0.3		2 N35E	10			O/F	8		×		×		HILLTOP
8-33	29 40.12	98 12.62	သွ		20 Kep		1 0.3	-	1.5 N61W				0	10		×			×	FLOODPLAI
8-34	29 40.11	98 12.66	WB-W		30 Kep	٦	4.0	_	SO WELL			.0	بر	9		×				STREAMBE
*DATU	- DATUM: NAD 83						- 1													
24 TYPE	.,.	TYPE			2B POINTS	NTS	_				8	BA INFILLING	S S							
o	Cave					8	Z	Non	None, exposed bedrock	×										
SC	Solution cavity					20	ပ	Coar	Coarse - cobbles, breakdown, sand, gravel	wopy	n, sand,	grave								
SF	Solution-enlarged fracture(s)	ed fracture(s)				23	0	Loos	Loose or soft mud or soil, organics, leaves, sticks, dark colors	oil, or	ganics, le	saves, st	icks, da	rk colors						
u.	Fault					20	ш	Fines	Fines, compacted clay-rich sediment, soil profile, gray or red colors	-rich s	ediment.	, soil pro	ile, gray	y or red colors						
0	Other natural b	Other natural bedrock features				w	>	Vege	Vegetation. Give details in narrative description	Sin	arrative c	sescriptic series of the serie	ç							
MB MB	Manmade feature in bedrock	ure in bedrack				8	S.	Flow	Flowstone, cements, cave deposits	aved	eposits									
SW	Swallow hole					8	×	Sh	Other materials											
胀	Sinkhole					20	l							(a						
용	Non-karst closed depression	ed depression				3				12 T	12 TOPOGRAPHY	APHY	3							
2	Zone, clustered	Zone, clustered or aligned features	Ires			30	៊ី	F. 135	Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed	ge, Fi	oodplain,	Stream	pac							

Plugged

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The

information presented here complies with that document end is a true representation of the conditions observed in the field.

My signature certifies that I am qualified as a geologist as defined and the conditions observed in the field.

THOMAS 0. MATHEWS

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TCEQ-0585-Table (Rev. 10-01-04)

FEATURE CHARACTERISTICS   SA   SA   SA   SA   SA   SA   SA	GEOL	OGIC ASS	GEOLOGIC ASSESSMENT TABLE	TABLI	ונט			잂	PROJECT NAME:									1			
19		LOCATIC	NO					FEA.	TURE CHARAC	TER	ISTIC	(A)			iii	EVALUATION	MOLL	4	PHYSICAL	CAL SETTING	ē
Directions   Continue   Continu	14	18 *		2A	2B	Е	=	4	SC.	SA	9	7	8A	69	6		10		=	12	
29 40.15   98 12.63   SC   20   Kep   3   1   29 40.14   98 12.88   C   30   Kep   15   8   1.3   29 40.14   98 12.88   SC   20   Kep   3   1.3   29 40.15   98 12.42   SF   20   Kep   0.5   0.5   0.5   29 40.15   98 12.42   SF   20   Kep   0.5   0.5   29 40.15   98 12.42   SF   20   Kep   0.5   0.5   29 40.15   98 12.42   SF   20   Kep   0.5   0.5   29 40.27   98 12.54   MB W   30   Kep   0.5   0.5   29 40.27   98 12.75   CD   S   Kep   0.5   0.5   29 40.23   98 12.75   CD   S   Kep   0.5   0.5   29 40.23   98 12.90   SC   20   Kep   150   15   15   29 40.25   98 12.86   Z-SC   30   Kep   10   2   29 40.25   98 12.86   Z-SC   30   Kep   10   2   29 40.25   98 12.86   Z-SC   30   Kep   10   2   29 40.25   98 12.86   Z-SC   30   Kep   10   2   29 40.3   98 12.61   SC   Z0   Kep   10   2   29 40.3   98 12.61   SC   Z0   Kep   10   2   20   4   20   4   20   4   20   4   20   4   20   4   20   4   20   4   20   4   20   4   20   4   20   4   20   20	FEATURE ID		LONGITUDE	FEATURE	POINTS	FORMATION	DIMEN	SIONS (FE.	_		DENSITY	APERTURE (FEET)		RELATIVE INFILTRATION RATE	TOTAL		SENSITIVITY	GATCHM	GATCHMENT AREA (ACRES)	TOPOGRAPHY	¥
29 40.15         98 12.63         SC         20 Kep         3         1           29 40.14         98 12.88         C         30 Kep         15         8           29 40.14         98 12.88         SC         20 Kep         0.5         0.5           29 40.15         98 12.66         SC         20 Kep         0.5         0.5           29 40.15         98 12.42         SF         20 Kep         0.5         0.5           29 40.15         98 12.42         SF         20 Kep         0.5         0.5           29 40.15         98 12.63         SC         20 Kep         0.5         0.5           29 40.15         98 12.63         SC         20 Kep         0.5         0.5           29 40.15         98 12.54         MB-W         30 Kep         0.5         0.5           29 40.27         98 12.75         CD         5 Kep         1.1         1           29 40.29         98 12.75         CD         5 Kep         1.5         1.5           29 40.25         98 12.90         SC         20 Kep         0.5         0.5           29 40.25         98 12.86         Z-SC         30 Kep         1.0         2							×	>	2	10						<4D	Ħ	61.6	817		
29 40.14         98 12.88         C         30 Kep         15         8           29 40.14         98 12.88         SC         20 Kep         3 1.3           29 40.15         98 12.66         SC         20 Kep         0.6 0.5           29 40.15         98 12.66         SC         20 Kep         0.6 0.8           29 40.15         98 12.42         SF         20 Kep         0.5 0.5           29 40.15         98 12.42         SF         20 Kep         0.5 0.5           29 40.15         98 12.42         SF         20 Kep         0.5 0.5           29 40.17         98 12.63         SC         20 Kep         0.5 0.5           29 40.27         98 12.75         CD         SKep         0.5 0.5           29 40.27         98 12.75         CD         SKep         0.5 0.5           29 40.25         98 12.86         Z-SC         30 Kep         0.5           29 40.25         98 12.86         Z-SC         30 Kep         0.5           29 40.25         98 12.61         SC         20 Kep         1.3           29 40.3         98 12.61         SC         20 Kep         2           29 40.3         98 12.61         SC	S-35	29 40.15	98 12.63	SC	20	Kep	3	-	4.5 E-W				z	5		25 X			×	FLOODPLAIN	Z
29 40.14         98 12.88         SC         20 Kep         3 1.3           29 40.15         98 12.66         SC         20 Kep         0.5 0.5           29 40.15         98 12.66         SC         20 Kep         0.6 0.5           29 40.15         98 12.42         SF         20 Kep         0.5 0.5           29 40.15         98 12.42         SF         20 Kep         0.5 0.5           29 40.15         98 12.42         SF         20 Kep         0.5 0.5           29 40.17         98 12.63         SC         20 Kep         0.5 0.5           29 40.17         98 12.54         MB-W         30 Kep         0.5 0.5           29 40.2         98 12.75         CD         SKep         0.5 0.5           29 40.2         98 12.75         CD         SKep         0.5 0.5           29 40.2         98 12.86         Z-SC         30 Kep         10 2           29 40.2         98 12.86         Z-SC         30 Kep         10 2           29 40.3         98 12.61         SC         20 Kep         10 2           29 40.3         98 12.61         SC         20 Kep         10 2           20 40.3         98 12.61         SC         20 Kep <td>S-36</td> <td>29 40.14</td> <td>98 12.88</td> <td>ပ</td> <td>30</td> <td>Kep</td> <td>15</td> <td>8</td> <td>7 N4E</td> <td></td> <td></td> <td></td> <td>z</td> <td>40</td> <td></td> <td>20</td> <td>×</td> <td>×</td> <td></td> <td>HILLTOP</td> <td></td>	S-36	29 40.14	98 12.88	ပ	30	Kep	15	8	7 N4E				z	40		20	×	×		HILLTOP	
29 40.15         98 12.66         SC         20 Kep         0.5 0.5           29 40.15         98 12.66         SC         20 Kep         0.8 0.8           29 40.15         98 12.42         SF         20 Kep         0.6 0.5           29 40.15         98 12.42         SF         20 Kep         0.5 0.5           29 40.17         98 12.63         SC         20 Kep         0.5 0.5           29 40.17         98 12.63         SC         20 Kep         0.5 0.5           29 40.17         98 12.54         MB-W         30 Kep         0.5 0.5           29 40.27         98 12.75         CD         SKep         1 1           29 40.27         98 12.75         CD         SKep         1.5 0.5           29 40.25         98 12.95         C-SC         20 Kep         1.0 2           29 40.25         98 12.86         Z-SC         30 Kep         1.0 2           29 40.25         98 12.61         SC         20 Kep         1.0 2           29 40.3         98 12.61         SC         20 Kep         1.0 2           29 40.3         98 12.61         SC         20 Kep         1.0 2           Solution cavity         Solution cavity         Solution ca	S-37	29 40.14	98 12.88	SC	20	Kep			1.3 N76W				0	15		35 X		×		HILLTOP	
29 40.15         98 12.66         SC         20 Kep         0.8         0.8           29 40.15         98 12.42         SF         20 Kep         8         12           29 40.15         98 12.42         SF         20 Kep         0.5         2           29 40.17         98 12.63         SC         20 Kep         0.5         2           29 40.17         98 12.64         SC         20 Kep         0.5         0.5           29 40.23         98 12.75         CD         SKep         0.5         0.5           29 40.24         98 12.75         CD         SKep         1         1           29 40.25         98 12.90         SC         20 Kep         0.5         0.5           29 40.25         98 12.95         C-SC         30 Kep         10         2           29 40.25         98 12.86         Z-SC         30 Kep         10         2           29 40.3         98 12.61         SC         20 Kep         10         2           29 40.3         98 12.61         SC         20 Kep         10         2           29 40.3         98 12.61         SC         20 Kep         10         2           Solution ca	S-38	29 40.15	98 12.66	SC	20	Kep	0.5		0.8 E-W				0	15		35 X		×		HILLTOP	
29 40.15         98 12.42         SF         20 Kep         8 12           29 40.15         98 12.42         SF         20 Kep         0.5         2           29 40.17         98 12.63         SC         20 Kep         0.5         2           29 40.19         98 12.54         MB VA         30 Kep         0.5         0.5           29 40.2         98 12.54         MB VA         30 Kep         0.5         0.5           29 40.2         98 12.7         CD         SC         20 Kep         0.5         0.5           29 40.2         98 12.7         CD         SC         20 Kep         0.5         0.5           29 40.2         98 12.9         C-SC         20 Kep         0.5         0.5           29 40.2         98 12.8         C-SC         30 Kep         10         2           29 40.2         98 12.8         C-SC         30 Kep         10         2           29 40.3         98 12.6         SC         20 Kep         10         2           29 40.3         98 12.6         SC         SO Kep         10         2           29 40.3         98 12.6         SC         SO Kep         10         2 <tr< td=""><td>S-39</td><td>29 40.15</td><td>98 12.66</td><td>SC</td><td>20</td><td>Kep</td><td></td><td>8.0</td><td>1 E-W</td><td></td><td></td><td></td><td>0</td><td>15</td><td></td><td>35 X</td><td></td><td>×</td><td></td><td>HILLTOP</td><td></td></tr<>	S-39	29 40.15	98 12.66	SC	20	Kep		8.0	1 E-W				0	15		35 X		×		HILLTOP	
29 40.15         98 12.42         SF         20 Kep         0.5         2           29 40.17         98 12.63         SC         20 Kep         1         1           29 40.19         98 12.68         SC         20 Kep         0.5         0.5           29 40.2         98 12.51         MB W         30 Kep         0.5         0.5           29 40.2         98 12.70         SC         20 Kep         1         1           29 40.2         98 12.75         CD         5 Kep         150         15           29 40.2         98 12.9         C-VR         5 Kep         150         15           29 40.2         98 12.8         C-SC         30 Kep         10         2           29 40.2         98 12.8         C-SC         30 Kep         10         2           29 40.2         98 12.8         C-SC         30 Kep         10         2           29 40.3         98 12.6         SC         20 Kep         10         2           29 40.3         98 12.6         SC         SO Kep         10         2           29 40.3         98 12.6         SC         SO Kep         10         2           20 4v.         <	8-40	29 40.15	98 12.42	SF	20	Kep	00		0.1 N12E		9		O/F	10)		30 X			×	STREAMBED	
29 40.17   98 12.63   SC   20   Kep   1   1   29 40.19   98 12.68   SC   20   Kep   0.5   0.5   29 40.19   98 12.68   SC   20   Kep   0.5   0.5   29 40.2   98 12.51   MB \text{ W4}   30   Kep   0.5   0.5   0.5   29 40.27   98 12.75   CD   5   Kep   1   1   1   29 40.23   98 12.75   CD   5   Kep   150   15   15   29 40.23   98 12.92   Z-SC   30   Kep   20   4   29 40.25   98 12.92   Z-SC   30   Kep   10   2   29 40.25   98 12.86   Z-SC   30   Kep   10   2   29 40.3   98 12.86   Z-SC   30   Kep   10   2   29 40.3   98 12.86   Z-SC   30   Kep   10   2   2   30   Kep   30   Solution cavity   Solution cavity   Solution cavity   Solution entarged fracture(s)   Solution entarged fracture(s)   Solution cavity	S-41	29 40.15	98 12.42	SF	20	Kep	0.5	7	1 N30E				L	Ω.		25 X		×		FLOODPLAIN	Z
29 40.19 98 12.68 SC 20 Kep 0.5 0.5 0.5 29 40.2 98 12.51 MB W 30 Kep 0.3 0.3 0.3 29 40.2 98 12.51 MB W 30 Kep 0.3 0.3 0.3 29 40.27 98 12.70 SC 20 Kep 1 1 1 29 40.24 98 12.75 CD 5 Kep 150 15 0.5 29 40.24 98 12.92 2.5C 30 Kep 150 15 0.5 29 40.25 98 12.92 2.5C 30 Kep 10 2 29 40.25 98 12.86 ZSC 30 Kep 10 2 29 40.25 98 12.86 ZSC 30 Kep 10 2 29 40.25 98 12.86 ZSC 30 Kep 10 2 2 1.3 NM: NAD 83  Natural bedrock features 20 Kep 20 C Solution cavity Solution cavity Solution cavity Solution bedrock features 30 FS Solution bedrock features 30 FS Solution cavity Solution cavi	S-42	29 40.17	98 12.63	SC	20	Kep	-	-	2 N40W				0	15		35 X			×	FLOODPLAIN	Z
29 40.2   98 12.51   MB W   30   Kep   0.3   0.3     29 40.27   98 12.70   SC   20   Kep   1   1     29 40.69   98 12.75   CD   5   Kep   150   15     29 40.24   98 12.95   CD   5   Kep   150   15     29 40.23   98 13.00   SC   20   Kep   150   15     29 40.25   98 12.92   ZSC   30   Kep   20   4     29 40.25   98 12.86   ZSC   30   Kep   10   2     29 40.3   98 12.61   SC   20   Kep   10   2     29 40.3   98 12.61   SC   20   Kep   10   2     29 40.3   98 12.61   SC   20   Kep   10   2     29 40.3   98 12.61   SC   20   Kep   20   4     29 40.3   98 12.61   SC   20   Kep   2   1.3     30   Nothion-enlarged fracture (s)   Solution cavity   Solution cavity   Solution bedrock features   Solution cavity   Solution cavit	S-43	29 40.19	98 12.68	SC	20	Kep	2		0.8				O/F	5		25 X		×		HILLTOP	
29 40,27   98 12,70   SC   20   Kep   1   1   29 40,69   98 12,75   CD   5   Kep   3.5   6   29 40,69   98 12,75   CD   5   Kep   150   15   15   29 40,24   98 12,93   O-VR   5   Kep   150   15   15   15   15   15   15   1	\$ 44	29 40.2	98-12.51	MB W	30	Kep		9.3	150				×	S)		*		×		HILTOR	
29 40,69   98 12,75   CD   5   Kep   3.5   6   29 40,24   98 12,93   O-VR   5   Kep   150   15   29 40,24   98 12,93   O-VR   5   Kep   150   15   15   29 40,23   98 13,00   SC   20   Kep   0.5   0.5   0.5   29 40,25   98 12,86   Z-SC   30   Kep   10   2   29 40,25   98 12,86   Z-SC   30   Kep   10   2   29 40,3   98 12,61   SC   20   Kep   10   2   1.3   29 40,3   98 12,61   SC   20   Kep   2   1.3   20   C   Solution cavity   Solution cavity   Solution enlarged fracture (s)   Solution enlarged fracture in bedrock features   Solution cavity	S-45	29 40.27	98 12.70	SC	20	Kep	Ţ	-	1				O/F	101		30 X		×		HILLTOP	
29 40.24   98 12.93   O-VR   5   Kep   150   150   150   29 40.23   98 13.00   SC   20   Kep   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5   0.5	S-46	29 40.69	98 12.75	00	5	Kep	3.5	9	1 N40W				O/F	25		30 X		×		HILLTOP	
29 40.23   98 13.00   SC   20   Kep   0.5   0.5     29 40.25   98 12.92   Z-SC   30   Kep   20   4     29 40.25   98 12.86   Z-SC   30   Kep   10   2     29 40.3   98 12.81   SC   20   Kep   2   1.3     29 40.3   98 12.61   SC   20   Kep   2   1.3     29 40.3   98 12.61   SC   20   Kep   2   1.3     29 40.3   98 12.61   SC   20   Kep   2   1.3     29 40.3   98 12.61   SC   20   Kep   2   1.3     29 40.3   98 12.61   SC   20   Kep   2   1.3     20 40.3   98 12.61   SC   20   Kep   2   1.3     20 40.3   98 12.61   SC   20   Kep   2   1.3     20 40.3   98 12.61   SC   20   C     20 5   5   5     20 6   7   5     20 7   7   5     20 8   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   5     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7   7     20 9   7     20 9   7   7     20 9   7     20 9   7   7     20 9   7     20 9   7     20 9   7     20 9   7   7     20 9   7     20 9   7     20 9   7     20 9   7     20 9   7     20 9   7     20 9   7	S-47	29 40.24	98 12.93	O-VR	5	Kep	150	15	N41W		10	0.1	z	10		15 X		×		HILLSIDE	
29 40.25   98 12.92   Z-SC   30 Kep   20 4 4 29 40.25   98 12.86   Z-SC   30 Kep   10   2 4 29 40.25   98 12.86   Z-SC   30 Kep   10   2 2 29 40.3   98 12.81   SC   Z0 Kep   2   1.3 2 20 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	S-48	29 40.23	98 13.00	SC	20	Kep		0.5	1.5 N40W				0	8		28 X		×		HILLTOP	
29 40.25   98 12.86   Z-SC   30   Kep   10   2   29 40.3   98 12.61   SC   20   Kep   2   1.3   29 40.3   98 12.61   SC   20   Kep   2   1.3   20   Kep   2   1.3   20   Kep   2   2   1.3   20   Kep   2   2   2   2   2   2   2   2   2	S-49	29 40.25	98 12.92	Z-SC	30	Kep	20	4	NSOE		0.3	1	0	8		38 X		×		HILLSIDE	
29 40.3   98 12.61   SC   20   Kep   2   1.3	S-50	29 40.25	98 12.86	Z-SC	30	Kep	10	2	2 N11W,N85	3			0	6		39	×	×		HILLSIDE	
TYPE	S-51	29 40.3	98 12.61	SC	20	Kep	2	1.3	3 N34E				Ц	10		30 X		_	×	STREAMBED	G
TYPE	DATUN	I: NAD 83																		_	
Solution cavity   20   C	2A TYPE		TYPE		2E	3 POINTS			_			8A INFILL	ING								
Solution cavity Solution enlarged fracture(s) Solution-enlarged fracture(s)  Fault Other natural bedrock features Swallow hole Sinkhole Non-karst closed depression 5	υ	Cave				8		ے ح	lone, exposed bedr	ock ock											
Solution-enlarged fracture(s) 20 Fault  Fault Other natural bedrock features 5 V Manmade feature in bedrock 30 FS Swallow hole 30 X Sinkhole 20 X	သင	Solution cavity				20	<u>J</u>	_	carse - cobbles, br	eakdov	wn, sand	i, gravel									
Fault Other natural bedrock features Other natural bedrock feature in bedrock Swallow hole Sinkhole Non-karst closed depression 5	SF	Solution-enlarge	ed fracture(s)			20	J		oose or soft mud of	r soll, a	rganics,	leaves, s	ticks, da	ark colors							
Other natural bedrock features 5  Mammade feature in bedrock 30 Swallow hole 30 Sinkhole 20 Non-karst closed depression 5	L	Fault				20			ines, compacted cl.	ay-rich	sedimer	nt, soil pro	file, gray	y or red colors							
Manmade feature in bedrock Swallow hole Sinkhole Non-karst closed depression 5	0	Other natural by	edrock features			S	_		'egetation. Give det	ails in I	namative	description	nc								
Swallow hole Sinkhole Non-karst closed depression 5	MB	Manmade featu	ire in bedrock			30	a.L.		lowstone, cements,	, cave	deposits	,-									
Sinkhole Non-karst closed depression 5	SW	Swallow hole				8	^	ں ر	Wher materials												
Non-karst closed depression	SH.	Sinkhole				20															
5.0	8	Non-karst close	ed depression			S	_			12	TOPOG	RAPHY									
	2	Zone, clustered	tor aligned featur	Sa		30		CIII, H	Illtop, HillsIde, Drair	nage, F	-loodplai,	in, Stream	peq								

THOMASO. MATHEWS

I have read, I understood, and I have followed the Texas Commission on Equipmental Quality's Instructions to Geologists. The information presented here complies with that document and is a tre-dependent property property of the field.

My signature certifies that I am qualified as a geologist as doring the property of the field.

THOMAS 0. MATHEWS Date 2/4/15

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Sheet 3 of B

TCEQ-0585-Table (Rev. 10-01-04)

GEO	LOGIC AS	GEOLOGIC ASSESSMENT TABLE	TABL	ш			PRO	JECT	PROJECT NAME:											
	LOCATION	NO					FEA	TURE C	FEATURE CHARACTERISTICS	ERIST	SOL				EV,	EVALUATION	NOI	PH	SICA	PHYSICAL SETTING
A1	18 -	10.	24	28	c		a		55	S.A.	20	7	8A	88	œ.		10	11	$\vdash$	12
FEATURE ID	יאדעטנ	LONGITUDE	FEATURE	POINTS	FORMATI	DIMEN	OIMENSIONS (FEET)	_	TREND (DEGREES)	NO N	OENSITY APER	APERTURE IN	INFILL RE	RELATIVE INFILTRATION RATE	TOTAL	SENS	SENSITIVITY	CATCHMENT AREA (ACRES)	\$	ТОРОВНАРНҮ
					_	×	>	Z		10	-	_	-			c40	প্ল	4.6 2	847	
S-52	29 40.31	98 12.72	브	20	Kep	1100		N65E	SE SE	10		0	O/F	15	45		×	×	S	STREAMBED
S-53	29 40.29	98 12.78	Z-CD	30	0 Kep	750 100	100	3 N65E	SE.	10		0	O/F	15	55		×	×	S	STREAMBED
S-54	29 40.31	98 12.91	CD	5	Kep	30	17	1 N73E	3E			0	0/0	æ	13 X	×		×	エ	HILLSIDE
S-55	29 40.33	98 12.83	sc	20	Kep		2.5	1 N70E	E E			0	N/O	6	39 X	×		×	Ξ	HILLSIDE
S-56	29 40.38	98 12.53	SF	20	Kep	0.3	0.5	2			_	0	O/F	10		×		×	エ	HILLTOP
S-57	29 40.56	98 13.03	MB-B	30	Kep	0.8	8.0	ဇ				Z		35	65		×	×	王	HILLTOP
8-58	29 40.39	98 12.69	SC	20	20 Kep	0.8	F	1.5 N40E	JE J	10		F,	F/O	0	39 X	×		- ×	Ξ	HILLTOP
S-59	29 40.39	98 12.79	SF	20	Kep	1	0.5	1.5 N28W	3W	ŀ		0	_	8	28 X	×		×	エ	HILLTOP
S-60	29 40.38	98 12.86	SH	20	Kep	6	4	3 N56E	3E	10		O	C/N	35			×	×	I	ILLTOP
S-61	29 40.39	98 12.88	SH	20	20 Kep	4	-	1.5 N19W	M6		1	10		15	35 X	×		×	Ξ	HILLTOP
S-62	29 40.38	98 12.99	SC	20	Kep	0.3	0.7	0.8 N73E	3E			0	_	8		×		×	王	HILLSIDE
S-63	29 40.45	98 12.67	ප	5	5 Kep	10	2	2 N83W	3W			S	C/N	10		×		×		STREAMBED
S-64	29 40.46	98 12.67	Z-SC	30	30 Kep	100	300	N40W	MC.			ŏ	2/0	20	50		×	×	S	STREAMBED
S-65	29 40.68	98 12.83	SH	20	20 Kep	6	12	0.5 N82E	2E			0	O/F	15	35 X	×		×	I	HILLTOP
S-66	29 40.46	98 12.65	ш	20	Kep	9	8	0.7 N50E	E	10		×		5	25 X	×		×	Œ	FLOODPLAIN
2-67		98 13.13	CD	5	5 Kep	20	8	0.7 N67W	W			0	O/C	10	15 X	×		×	I	HILLTOP
S-68	29 40.47	98 13.14	SF	20	20 Kep	9	F	2.3 N-S				0	O/F	10	30 X	×		×	王	HILLTOP
.DATU	DATUM: NAD 83																			
2A TYPE	m	TYPE		2B P	POINTS						BA I	8A INFILLING	බි							
ပ	Cave				30		z	None, exp.	None, exposed bedrock	يد										
sc	Solution cavity				20		٥	Coarse - c	Coarse - cobbles, breakdown, sand, gravel	kdown,	sand, gr	ave								
SF	Solution-enlarged fracture(s)	ged fracture(s)			20			Loose or s	Loose or soft mud or soil, organics, leaves, sticks, dark colors	oil, orga	nics, lea	ives, stic	ks, dark	colors						
LL.	Fault				20			Fines, con	Fines, compacted clay-rich sediment, sail profile, gray or red colors	rich sec	diment, s	sail profil	e, gray o	or red colors						
0	Other natural t	Other natural bedrock features			rU		<i>&gt;</i>	Vegetation	Vegetation. Give details in narrative description	s in nan	rative de:	scription	_							
MB	Manmade feat	Manmade feature in bedrock			30			Flowstone	Flowstone, cements, cave deposits	ave dep	osits									
SW	Swallow hole				30		×	Other materials	erials											
SH	Sinkhole				20	9 3														
8	Non-karst clos	Non-karst closed depression			c,					12 TO!	12 TOPOGRAPHY	λHd								
2	Zone, clustere	Zone, clustered or aligned features	sau		30		Cliff, F	-Illiop, Hill	Cliff, Hiltop, Hillside, Drainage, Floodplain, Streambed	ge, Floo	dplain, S	Streambe	D.							

i	
3	12 TOPOGRAPHY
30	Cliff, Hillop, Hillside, Drainage, Floodplain, Streambed
,boot	stood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The

information presented here complies with that document and is a true revector of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by your certifies that I am qualified as a geologist as defined by the Chapter of the conditions observed in the field. in \* \* profes I have read, ! understo

TCEQ-0585-Table (Rev. 10-01-04)

Sheet 4 of 8

THOMASO.MATHEWS

GECLOGY

																			Plugged	() ()													
	CAL SETTING	12	TOPOGRAFHY		FLOODPLAIN	STREAMBED	STREAMBED	CLIFF	STREAMBED	STREAMBED	STREAMBED	HILLTOP	STREAMBED	STREAMBED	HILLTOP	HILLTOP	HILLTOP	STREAMBED	HILLTOP	HILLTOP	HILLTOP												
	PHYSICAL	11	CATCHINENT AREA (ACRES)	뮋	×	×	×	×	×	×	×		×	×				×															
			PT-S	6,12			L	L				×		L	×	×	×		ж	×	×												
	NOI	10	SENSITIVITY	Ä	×	×	×	×	×	×				×					×														
	EVALUATION		SENS	<40							×	×	×		×	×	×	×		×	×												
	EVA	да	TOTAL		45	45	45	55	09	45	38 X	35 X	15 X	50	30 X	13	33 X	24 X	92	31 X	38 X												
		98	RELATIVE INFICTRATION RATE		25	15	25	25	30	15-20	8	15	10	10	10	8	13	6	40	11	80					urk colors	y or red colors						
		₩ W	INFIL		0	O/F	O/F	O/F	N/C	C/F	0/0	N/F	ь	NO	O/F	0	0	O/F	z	0	0		NG			icks, da	file, gray	5					peq
		7	APERTURE (FEIT)		Ī	Ī	0.25												Ī				BA INFILLING		gravel	aves, SI	soil pro	lescriptio				γH√	Stream
	SOLL	9	(NO/FT)		H		7	h	T										i				86		, sand,	anics, le	ediment,	rrative d	posits			12 TOPOGRAPHY	odplain,
	TERIS	SA SA	DON	10		10			10	10				5				10			10			픙	akdown	soil, org	/-rich se	lls in na	ave de			12 TC	ge, Flo
PROJECT NAME:	FEATURE CHARACTERISTICS	5	TREND (DEGREES)		S-N	2.5 N58E	0.5 N80E	4 N30E	9 N50E	N40E	S-N	5 N30W	3 N40W	7 N45E	.5 N80W	5 N57W	2 N77E	N45E		3 N60W	.5 N46E			None, exposed bedrock	Coarse - cobbles, breakdown, sand, gravel	Loose or soft mud or soil, organics, leaves, sticks, dark colors	Fines, compacted clay-rich sediment, soil profile, gray or red colors	Vegetation, Give details in narrative description	Flowstone, cements, cave deposits	Other materials			Ciff, Hillop, Hillside, Drainage, Floodplain, Streambed
SOJE	ATUE		S (PEET)	Z	4 4			4				-	Щ	7.0.7	-	0		3	9	4 3	-			None	Coan	Loose	Fines	Vege	Flows	Other			f, Hillo
씸	H	4	DIMENSIONS (FEET)	>	8	.5 0.8	1 0.3	20	300 50	00	30 80	0.7 0.7	150 40	-	4 0.4		0.5 0.7	40 18	9-6		2 0.3			z	U	٥	IL.	>	S.	×			Cit
		_		×	0					2400	L										Ц	100	S	30	202	0.	20	40	30	8	9	10	30
		ю	S FORMATI		20 Kep	20 Kep	20 Kep	30 Kep	0 Kep	20 Kep	30 Kep	20 Kep	5 Kep	30 Kep	20 Kep	5 Kep	20 Kep	5 Kep	30 Kep	20 Kep	20 Kep		2B POINTS	(*3	7	(4	***		(")	63	**		9)
щ		5B	POINTS		2	2	2	3	8	2	3	2		60	2		2		8	2	2		25										
TABI		*	PEATURE TYPE		SC	SC	SF	Z-C	Z-CD	F	O-Z	SC	8	Z-SC	SF	9	SC	O-FR	W GW	SC	SF												Se
GEOLOGIC ASSESSMENT TABLE	NO	10-	LONGTUBE		98 12.46	98 12.43	98 12.42	98 12.55	98 12.8	98 12.88	98 12.92	98 12.93	98 12.93	98 13.15			98 13.22	98 13.11	98-13.21	98 13.52	98 13.46		TYPE			red fracture(s)		Other natural bedrock features	ure in bedrock			ed depression	Zone, clustered or aligned features
LOGIC AS	LOCATION	-81	LATTUDE		29 40.12	29 40.23	29 40.25	29 40.11	29 40.8	29 41.26	29 40.79	29 40.76	29 40.98	29 41.14	29 41.13	29 40.98	29 40.99	29 41.03	29 40.82	29 41.33	29 41.29	DATUM: NAD 83		Cave	Solution cavity	Solution-enlarged fracture(s)	Fault	Other natural t	Manmade feature in bedrock	Swallow hole	Sinkhole	Non-karst closed depression	Zone, clustere
GEO		4	FEATURE ID		8-69	S-70	S-71	S-72	S-73	8-74	S-75	S-76	S-77	S-78	S-79	S-80	5-81	S-82	8-83	S-84	S-85	*DATU	2A TYPE	O	SC	S	u.	0	MB	SW	SH	8	2

have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true conditions observed in the field.

My signature centures that I am qualified as a geologist as defined by the conditions observed in the field.

THOMAS O. MATHEWS

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Sheet 5 of 8

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GEO	LOGIC AS	GEOLOGIC ASSESSMENT TABLE	TABL	ш			PRC	PROJECT NAME	NAME:										
	LOCATION	NOL					FEA	TUREC	FEATURE CHARACTERISTICS	ERIST	SOI			EV	EVALUATION	NOL	P	YSIC	PHYSICAL SETTING
\$	18.	ភ្	¥2	2B	es		4		5	S,A	6 7	8A	88	O4		9	11	Γ	12
FEATURE ID	D LATITUDE	LONGTUDE	FEATURE	POINTS	FORMATION	DIMEN	DIMENSIONS (FEET)		TREND (DEGREES)	E S	DENGITY APERTURE (NOFT)	RE INFILL	RELATIVE INFILTRATION RATE	TOTAL	SER	SENSITIVITY	CATCHMENT AREA (ACRES)	AENT	TOPOGRAPHY
						×	>-	2		10					200	Ä	6,15	917	
S-86	29 41.5	98 13.68	SF	20	20 Kep	2	0.2	1 N55W	N.	L		0	80		28 X		×	T	HILLTOP
S-87	29 41.51	98 13.7	SF	20	20 Kep	4	-	2 N39W	M	_		0	80		28 X		×	T	HILLTOP
S-88	29 41.49	98 13.82	O-FR	5	5 Kep	6	25	1 N45E		9		0/0	15		30 X			×	STREAMBED
S-89	29 41.53	98 13.73	20	5	5 Kep	9	4	0.7 N-S				0	80		13 X			T	STREAMBED
S-90	29 41.69	98 13.45	MB-W	30	30 Kep			WEL		$\vdash$		×	5		35 X		×	T	HILI TOP
S-91	29 41.64	98 13.38	R	20	20 Kep	3.5	2	2 E-W		_		O/F	18	L	38 X		×	T	HILTOP
S-92	29 41.56	98 13.5	SC	20	20 Kep	1.5	0.5	2.5 N70W	M			0	13		33 X		×	T	HILLTOP
<b>S</b> -93	29 41.56	98 13.52	sc	20	20 Kep	3	-	N-S		-		9/F	7	27	27 X		×		HILLTOP
S-94	29 41.63	98 13.38	SF	20	20 Kep	3.5	0.4	1.8 N20W	Mı	_	_	0	7	27	27 X		×	T	HILLTOP
S-95	29 41.63	98 13.41	SF	20	20 Kep	0.4	က	1.7 N70E	Ä	-		0	11	3	31 X		×	T	HILLTOP
96-S	29 41.66	98 13.86	SC	20	20 Kep	1.3	-	2.5 N10E	ĮĮ.	_		0	13		33 X		×		HILTOP
2-97	29 41.65	98 13.88	SH	20	20 Kep	4.5	3	2.5 N50E		10		ပ	0		39 X		×	T	HILLTOP
S-98	29 41.58	98 13.92	SC	20	20 Kep	۲-	-	3.5 N-S		-		0	13	L	33 X		×		HILLTOP
S-99	29 41.77	98 13.48	CD	5	5 Kep	5	က	S-N 6.0				0	5		10 X		×		HILLTOP
S-100	S-100 29 41.77	98 13.5	SH	20	20 Kep	20	15	3 NGOE	ĮĮ.	10		O/F	20	22		×	×		HILLTOP
S-101	S-101 29 41.82	98 13.57	CD	5	5 Kep	40	10	0.9 N50E		10		೦	ß		20 X	L	×		HILLTOP
S-102	S-102 29 40.18	98 12.61	Z-SC	30	30 Kep	300	70	8 N-S				C/N	35	65	100	×		×	STREAMBED
*DATU	* DATUM:NAD83																		

2B POINTS	L	BA INFILLING
30	z	None, exposed bedrock
20	ပ	Coarse - cobbles, breakdown, sand, graval
20	0	Loose or soft mud or soil, organics, leaves, sticks, dark colors
20	Щ	Fines, compacted clay-rich sediment, soil profile, gray or red colors
ທ	>	Vegetation. Give details in narrative description
30	S.	Flowstone, cements, cave deposits
30	×	Other materials
20		
ď		12 TOPOGRAPHY
30	*	CIR Hillor Hilliand Orabinas Ricasolain Orabantes

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true repersentable of the ordinitions observed in the flaid. My signature certifies that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist as defined bright that I am qualified as a geologist and that I am qualified as a geologist as a

Zone, clustered or aligned features

Non-karst closed depression

Other natural bedrock features

Manmade feature in bedrock

Swallow hole Sinkhole

Solution-enlarged fracture(s)

Solution cavity

Cave

2A TYPE

TCEQ-0585-Table (Rev. 10-01-04)

THOMAS O. MATHERAS GEGLOGY

Sheet 6 of 8

	LOCATION	N					FEA	TUR	FEATURE CHARACTERISTICS	ERI	STICS				EV	EVALUATION	NOI	PHY	PHYSICAL SETTING	NG
≰	-81	101	7Z	2B	8		4	П	S	SA.	8	1 4	8A	63	an an		01	11	12	
FEATURE ID	CATTUDE	LONGITUDE	FEATURE	POWITE	FORMATION		DIMENSIONS (FEET)	(Lag	TRENO (DEGREES)	DOM	DENBITY A	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENS	SENSITIVITY	CATCHMENT AREA (ACRES)	TOPOGRAPHY	PH?
						×	>	2	Ŋ	10						<40	240	c1.6 ×1.6	9	
S-103	29 40.68	98 12.75	SH	20	20 Kep	7	7	0.5				ĺ	O/F	15	35 X	×		×	HILLTOP	
S-104	29 39.97	98 12.77	CD	5	5 Kep	92	20	3	3 NW-SE			Ī	0	15	20 X	×		×	STREAMBED	ED
S-105	29 39.94	98 12.72	9	5	5 Kep	18	10	-	E-W				Ö	15	20 X	×		×	STREAMBED	ED
S-106	29 40.13	98 12.42	G	5	5 Kep	15			0.9 N50W	1		ĺ	_ ပ	15	20 X	×		×	STREAMBED	ED
7	S-107 29 40.14	98 12.37	8	5	5 Kep	20	18		3 N30W				S	15	20	20 X		×	STREAMBED	ED
S-108	29 41.94	98 13.4	20	5	5 Kep	250			1 N50E	10			F	5	20	20 X		×	HILLTOP	
S-109	29 40.40	98 12.66	CD	9	Kep	35	6	-					ŭ.	<b>σ</b>	14	14 X		×	HILLTOP	
П								1												
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	SOCOL	1000		1	O.F.	_					à	ONI PICI LIND	2							
A YPE	dist.	<u> </u>		Ā			z	ACO.	None exposed bedrock	يد	õ	יולן וליו	2							
					8 8					1		100								
	Solution cavity				20		- د	Coars	Coarse - coppies, preakdown, sand, gravel	X Q Q V	m, sand,	grave								
	Solution-enlarged fracture(s)	d fracture(s)			20			Loose	Loose or soft mud or soil, organics, leaves, sticks, dark colors	ojj, o	ganics, 1	saves, si	ticks, da.	rk colors						
	Fauk				30			Fines,	Fines, compacted clay-rich sediment, soil profile, gray or red colors	-ich	sediment,	soil pro	file, gray	or red colors						
	Other natural bedrock features	drock features			ın			Veget	Vegetation. Give details in narrative description	S in	arralive c	<b>lescriptic</b>	Ĕ							
	Manmade feature in bedrock	re in bedrock			30		FS	Flows	Flowstone, cements, cave deposits	ave d	eposits									
	Swallow hole				33		×	Other	Other materials											
	Sínkhole				20										-					
	Non-karst closed depression	d depression			4O	-				12 T	12 TOPOGRAPHY	4PHY			16.000					
	T	Zee chieforod or allohod fastings	-		00	_	010	THE .	Section Calchest President Calchest Canada Control Control Control Calchester	Ĺ		i								

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation presented here complies with that document and is a true representation presented here complies with that document and is a true representation of the field.

My signature certifies that I am qualified as a geologist as defined by SUZAN STATES THE THOMAS THOMAS (140)

Sheet 7 of 8

THOMASO. MATHERES

TCEQ-0585-Table (Rev. 10-01-04)

GEO	LOGIC AS	GEOLOGIC ASSESSMENT TABLE	T TABL	щ			PR	OJE	PROJECT NAME:										9
	LOCATION	ION					H	ATU	FEATURE CHARACTERISTICS	ER	STICS				回	EVALUATION	NO	PHYS	PHYSICAL SETTING
¥	18 *	10.	24	28	ю		7		5	PA S		7	BA.	88	æ	_	10	Ε	12
FEATURE ID	a: WATTUDE	LONGITUDE	FEATURE	POINTS	FORMATION	- 1	DIMENSIONS (FEET)	(FEET)	TREND (DEGREES)	DOM	DENBITY A	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TDTAL	SENSITIVITY	TIVIT	CATCHMENT AREA (ACRES)	TOPOGRAPHY
				_		×	>	z		10						C40	25	61.6	
S-110	7 29°39.77	98°12.53	MB-W		30 Kep	_			WELL	Г			×	D	35 X	×		×	HILLTOP
S-111	1 29°39.99	98°12.33	MB-W		30 Kep				WELL				×	2	35 X	×		×	HILLSIDE
S-112	2 29°40.03	98°12.32	MB-W		Kep				WELL				×	3	35 X	×		×	FLOODPLAIN
S-113	3 29°40.07	98°12.90	MB-W		30 Kep			Ц	WELL				×	5	35 X	×		×	HILLSIDE
		3																	
	y x																		
						4													
						_													
						1													
						-													
	-																		
DAIL.	DATUM:NAD83					r									ľ				
2A TYPE	뀌	TYPE		.4	2B POINTS	10					αĵ	8A INFILLING	CING						
ပ	Cave				30	c	z	None	None, exposed bedrock	~									
သွ	Solution cavity	<b>~</b>			20	0	ပ	Coar	Coarse - cobbles, breakdown, sand, gravel	kdow	m, sand,	gravel							
SF	Solution-enlar	Solution-enlarged fracture(s)			20	0	0	Loos	Loose or soft mud or soil, organics, leaves, sticks, dark colors	oji, or	ganics, li	eaves, s	sticks, da	irk colors					
ш	Fault				20	0	u.	Fines	Fines, compacted clay-rich sediment, soil profile, gray or red colors	ńch	sediment	, soil pr	ofile, gray	y or red colors					
0	Other natural	Other natural bedrock features			\$	10	>	Vege	Vegetation. Give details in narrative description	Sin	arrative t	descripti	uo.						
₽	Manmade fea	Manmade feature in bedrock			90	0	FS	Flow	Flowstone, cements, cave deposits	ave d	eposits								
SW	Swallow hole				8	0	×	Othe	Other materials										
υ Η	Sinkhale				20	0													
9	Non-karst clos	Non-karst closed depression			***	2				12.7	12 TOPOGRAPHY	APHY							
2	Zone, clustere	Zone, clustered or aligned features	res	,	30	0	SE	, Hillto	Ciff, Hilltop, Hillside, Drainage, Floodplain, Streambed	je, Fļ	oodplain,	Stream,	paqu						
						Ī													

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 Vagetation. Give details in narrative description FS Flowstone, cements, cave deposits			8A INFILLING
		z	None, exposed bedrock
		ပ	Coarse - cobbles, breakdown, sand, gravel
		0	Loose or soft mud or soil, organics, leaves, sticks, dark colors
		u.	Fines, compacted clay-rich sediment, soil profile, gray or red colors
	Flowstone, cements, ca Other materials	>	Vegetation. Give details in narrative description
×		FS	
Onite (Haltinals	12 TOPOGRAPHY	×	Other materials
			12 TOPOGRAPHY

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The politions observed in the field. My signature certifies that I am qualified as a geologist as defined of the signature certifies that I am a signature certifie information presented here complies with that document and is a true con-

TCEQ-0585-Table (Rev. 10-01-04)

Sheet 8 of 8

THOMASO, MATHEW Sate

SECLOGY 5321

# Modification of a Previously Approved Plan

**Texas Commission on Environmental Quality** 

for Regulated Activities on the Edwards Aquifer Recharge Zone and Transition Zone and Relating to 30 TAC 213.4(j), Effective June 1, 1999

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

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

# Signature

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

Print Name of Customer/Agent: J. Brandon Klenzendorf, P.E.

Date: 9.17.2018

Signature of Customer/Agent:

**Project Information** 

1. Current Regulated Entity Name: <u>Capitol Aggregates Solms Operation</u>

Original Regulated Entity Name: New Braunfels Quarry

Regulated Entity Number(s) (RN): 105203939

Edwards Aquifer Protection Program ID Number(s): 2643.00

The applicant has not changed and the Customer Number (CN) is: 604033142

The applicant or Regulated Entity has changed. A new Core Data Form has been provided.

2. Attachment A: Original Approval Letter and Approved Modification Letters. A copy of the original approval letter and copies of any modification approval letters are attached.

<ul> <li>3. A modification of a previously approved plan is requested for (check all that apply):         <ul> <li>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;</li> <li>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;</li> <li>Development of land previously identified as undeveloped in the original water pollution abatement plan;</li> <li>Physical modification of the approved organized sewage collection system;</li> <li>Physical modification of the approved underground storage tank system;</li> <li>Physical modification of the approved aboveground storage tank system.</li> </ul> </li> </ul>				
plan has been modified m	difications (select plan type being r ore than once, copy the appropriat he information for each additional	te table below, as		
WPAP Modification	Approved Project	<b>Proposed Modification</b>		
Summary				
Acres	<u>1,015</u>	<u>1,015</u>		
Type of Development	Industrial (Quarry)	Industrial (Quarry)		
Number of Residential	<u>N/A</u>	<u>N/A</u>		
Lots				
Impervious Cover (acres)	<u>169</u>	82.2		
Impervious Cover (%	<u>16.7%</u>	<u>8.1%</u>		
Permanent BMPs	Quarry pit, wet basin	Quarry pit, VFS		
Other	<u>N/A</u>	<u>N/A</u>		
SCS Modification	Approved Project	Proposed Modification		
Summary				

<u>N/A</u>

N/A

N/A

<u>N/A</u>

N/A

N/A

Linear Feet

Other

Pipe Diameter

AST Modification Summary	Approved Project	Proposed Modification		
Number of ASTs	<u>1</u>	N/A		
Volume of ASTs	<u>10,000 gallons</u>	N/A		
Other	N/A	<u>N/A</u>		
		<del></del>		
UST Modification	Approved Project	Proposed Modification		
Summary				
Number of USTs	<u>N/A</u>	<u>N/A</u>		
Volume of USTs	N/A	<u>N/A</u>		
Other	<u>N/A</u>	<u>N/A</u>		
5. Attachment B: Narrative of Proposed Modification. A detailed narrative description of the nature of the proposed modification is attached. It discusses what was approved, including any previous modifications, and how this proposed modification will change the approved plan.				
<ul> <li>Attachment C: Current Site Plan of the Approved Project. A current site plan showing the existing site development (i.e., current site layout) at the time this application for modification is attached. A site plan detailing the changes proposed in the submitted modification is required elsewhere.  The approved construction has not commenced. The original approval letter and any subsequent modification approval letters are included as Attachment A to document that the approval has not expired.  The approved construction has commenced and has been completed. Attachment C illustrates that the site was constructed as approved.  The approved construction has commenced and has been completed. Attachment C illustrates that the site was not constructed as approved.  The approved construction has commenced and has not been completed.  Attachment C illustrates that, thus far, the site was constructed as approved.  The approved construction has commenced and has not been completed.  Attachment C illustrates that, thus far, the site was constructed as approved.</li> </ul>				
provided for the new acre	red plan has increased. A Geologic rage. ed to or removed from the approv			
needed for each affected county in which the project	d one (1) copy of the application, princorporated city, groundwater conct will be located. The TCEQ will dings. The copies must be submitted	nservation district, and stribute the additional		

# Attachment A – Original Approval Letter and Approved Modification Letters

A copy of the original WPAP approval letter dated 12 July 2007 is attached. In addition, a copy of the previous WPAP modification approval letter dated 6 May 2015 is attached. Furthermore, an AST Plan was approved on 30 November 2017; the AST Plan approval letter is not required as part of this WPAP modification request.

# **Attachment B – Narrative of Proposed Modification**

Capitol Aggregates, Inc. proposes to modify approved activities and features proposed within the project limits of the Capitol Aggregates Solms Operation at 1026 Solms Quarry Road, New Braunfels, Texas. The overall Solms Operation Site includes areas in both the Edwards Aquifer Recharge Zone and Transition Zone and has an approved WPAP submitted by Westward Environmental, Inc. on behalf of Holcim (US) Inc. on 6 April 2007. The WPAP was approved on 12 July 2007 (Edwards Aquifer Protection Program ID No. 2643.00). According to the original WPAP application, the entire Capitol Aggregates Solms Operation Site consists of 1,015 acres with 853 acres on the Edwards Aquifer Recharge Zone and 162 acres on the Transition Zone. Permanent pollution abatement measures consisted of earthen berms, rock berms, and natural vegetated buffer areas during the site preparation and excavation/processing phase.

A WPAP modification was approved on 6 May 2015 and included a wet basin (referred to as a "stormwater detention pond" in the WPAP modification application) as a permanent BMP to provide treatment for the previously proposed hot mix plant, stockpile and equipment storage area, and concrete batch plant area as well as "overtreatment for the (stream) crossings and paved areas of the entrance road". An AST Plan was approved on 30 November 2017 and includes one 10,000-gallon diesel fuel tank located next to the scale house.

This WPAP modification request consists of removing the previously approved 62-acre hot mix plant, stockpile and equipment storage area, 4-acre concrete batch plant area, and associated 5-acre wet basin in the northern portion of the site over the Edwards Aquifer Recharge Zone as well as the haul road from the south portion to the north portion of the site and Stream Crossing 2 along the haul road. Construction of these features has not commenced. A designated area for hot mix asphalt plant activities is reserved for leasing by others in a 12.1-acre tract in the southern portion of the site immediately to the east of the scale house and over the Edwards Aquifer Transition Zone. The approved northern stockpile and equipment storage area will no longer be required since the existing quarry pit was previously approved as a plant and stockpile area which includes equipment storage. The approved concrete batch plant area will also no longer be required. The wet basin was approved to provide "overtreatment for the (stream) crossings and paved areas of the entrance road". Because of the removal of the proposed hot mix

plant, stockpile and equipment storage area, and concrete batch plant areas, the wet basin will no longer be required. The stream crossings and paved areas of the entrance road on the southern portion of the site will instead be treated with proposed vegetated filter strip permanent BMPs as part of this WPAP modification. Construction has not commenced on the previously proposed stream crossings. The WPAP modification request also includes construction of a proposed lab building and septic tank near the scale house on the southern portion of the site over the Edwards Aquifer Transition Zone.

Survey staking will not be completed because the site is an active quarry and limited survey staking is currently existing due to ongoing quarry operations. Site personnel will be available 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 near the boundaries of the area associated with the WPAP modification request.

In summary, Capitol Aggregates proposes to modify the existing WPAP at the Capitol Aggregates Solms Operation in order to:

- 1) **Remove the Hot Mix Plant Area:** Remove the approved 62-acre hot mix plant area in the northern portion of the Site over the Edwards Aquifer Recharge Zone; a designated area for hot mix asphalt plant activities is reserved for leasing by others in a 12.1-acre tract in the southern portion of the site over the Edwards Aquifer Transition Zone.
- 2) **Remove the Stockpile and Equipment Storage Area:** The approved northern stockpile and equipment storage area will no longer be required since the existing quarry pit was previously approved as a plant and stockpile area which includes equipment storage.
- 3) **Remove the Concrete Batch Plant Area:** Remove the approved 4-acre concrete batch plant area from the Site; a concrete batch plant is no longer proposed.
- 4) **Remove the Wet Basin:** Due to the removal of impervious cover associated with the hot mix plant, stockpile area, equipment storage area, and concrete batch plant area from the Edwards Aquifer Recharge Zone, the 5-acre wet basin is no longer required or proposed; runoff from other on-site impervious cover will be treated with proposed vegetated filter strips or be retained in the quarry pit as permanent BMPs.
- 5) Remove the Haul Road, Adjacent Vegetated Buffers, and Stream Crossing 2: Due to the removal of the proposed hot mix plant, stockpile and equipment storage area, and concrete batch plant areas in the northern portion of the property, the 20.9 acres of approved haul road and associated vegetated buffers along the western site perimeter will no longer be required. The removal of the haul road will also eliminate the need for Stream Crossing 2 (concrete crossing with four 18-inch culverts) in the approved WPAP.
- 6) Addition of Permanent Engineered Vegetated Filter Strips: Due to the removal of the wet basin, proposed gravel impervious cover associated with Stream Crossings 1 and 3 will require water quality treatment. The addition of permanent engineered vegetated

filter strips adjacent to Stream Crossings 1 and 3 will serve as treatment for this limited amount of impervious cover located outside the quarry pit. Furthermore, permanent engineered vegetated filter strips are proposed west of the construction entrance and south of the infrastructure at the entrance road to the quarry.

- 7) **Addition of Lab Building:** The proposed lab building will be constructed near the scale house and over the Edwards Aquifer Transition Zone. This building will be less than 1,000 square feet in impervious cover.
- 8) **Addition of Septic Tank:** The proposed septic tank will be constructed near the scale house and over the Edwards Aquifer Transition Zone. The Transition Zone drains away from the Recharge Zone. A Suitability Letter from the Office of Comal County Engineer is provided in this WPAP modification request.

# Attachment C – Current Site Plan of the Approved Project

The previously approved "Proposed Conditions Plan" prepared by Westward Environmental and submitted with the approved previous WPAP modification is attached. Quarrying activities have commenced in accordance with the previous WPAP modification Site Plan and are currently ongoing.

Clearing has been completed in the initial plant area, and earthen berms have been constructed around the initial plant and stockpile areas. Quarrying operations have begun in the initial quarry pit area. The initial rock crushing plant has been installed, and crushing and screening operations are producing material for use on-site and shipment off-site. The recycle water ponds adjacent to the scale house have been constructed to wash aggregate produced at the wet plant. The approved AST has been installed and is being operated to fuel on-site equipment.

JUL 12 2007 13.43 I

Kathleen Hartnett White, Chairman Larry R. Soward, Commissioner H. S. Buddy Garcia, Commissioner Glenn Shankle, Executive Director



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 12, 2007

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JUL 12 2007

**COUNTY ENGINEER** 

Mr. Jim Addams Holeim (US) Inc. 122 W. Carpenter Freeway, Suite 485 Irving, Texas 75039

Re: Edwards Aquifer, Comal County

NAME OF PROJECT: New Braunfels Quarry; Located on the north side of FM 482, approximately 3 miles southwest of the intersection with IH 35; New Braunfels ETJ, 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. 2643.00; Investigation No. 557130; Regulated Entity No. RN105203939

Dear Mr. Addams:

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 Westward Environmental, Inc. on behalf of Holcim (US) Inc. on April 6, 2007. Final review of the WPAP was completed after additional material was received on June 14, 2007 and June 25, 2007. As presented to the TCEQ, the Temporary 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 commercial project is a limestone quarry that will have an area of approximately 1,015 acres with 853 acres on the Recharge Zone. Quarrying activities will only occur on the Recharge Zone and be divided into 4 pits separated by 25 foot setbacks from the 100 year floodplain. Fifty foot setbacks will be provided for property boundaries. The total impervious cover for the site is approximately 80 acres. Twelve acres of existing ranch roads, consisting of compacted base material, are located on the recharge zone and the roads will not be widened or improved. Approximately 68 acres of impervious cover is proposed within the transition zone and will include the plant site, a portable building, scale house, truck scale, secondary processing plant, rail siding and cement storage facility. The quarry pit area will have a portable rock crushing plant and a conveyor system to transport product. Quarrying will occur to an elevation no deeper than 25 feet above the maximum potentiometric surface of the Edwards Aquifer stated to be 685 feet in the southern portion and 705 feet in the northern portion of the site. Project wastewater (domestic) will be collected in portable toilets and disposed of by a TCEQ registered waste disposal service.

REPLY TO: REGION 13 • 14250 JUDSON RD. • SAN ANTONIO, TEXAS 78233-4480 • 210-490-3096 • FAX 210-545-4329

COUNTY ENGINEER

# PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of storm water runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, various controls describe below will be utilized.

Site Preparation and Excavation/Processing

- A two foot high (minimum) earthen berm will direct upgradient water around the plant site.
- A four to six foot high earthen berm will be located on the downgradient side of the plant area and will store storm water runoff from this area.
- Silt fence, earthen berms and rock berms will be constructed to prevent pollutants from entering surface streams and sensitive features.
- A 25 foot natural undisturbed vegetated buffer area will be maintained between the quarry disturbance and the 100 year floodplain.

Pit/Site Closure

Storm water runoff that contacts sediment in the quarry will be retained in the quarry pit.

A request was made for an exception to the requirement of permanent BMP for this project after pit and/or site closure. Based upon the plan review, the justification review, the nature of the regulated activity, the BMPs provided during the excavation and processing phase, TCEQ regulations and consistency with previous quarry approvals pursuant to 30 TAC 213, the TCEQ grants the exception request for not providing BMPs after the quarrying operations have been completed.

#### **GEOLOGY**

According to the geologic assessment included with the application, 109 geologic and manmade features exist at the project site. Nineteen features (6 zones, 3 swallow holes, 2 faults, 1 solution enlarged fracture, 2 caves, 3 solution cavities, 1 well and 1 manmade boring) were rated as sensitive (>40). Any sensitive geologic feature in the quarry pit will be undisturbed until mining operations progress near the feature. The feature will be temporarily sealed until the feature can be mined out in the quarrying process. The San Antonio Regional Office conducted a site assessment on June 25, 2007 and found the site to be in general agreement with the geologic assessment.

#### SPECIAL CONDITIONS

#### General

- I. The holder of the approved Edwards Aquifer WPAP must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the application.
- II. In addition to the rules of the Commission, the applicant may also be required to comply with federal, state and local ordinance and regulations providing for the protection of water quality.
- III. This approval does not authorize manufacturing of explosives on the site.
- IV. This approval does not authorize the construction of an above ground storage tank facility. A separate AST facility plan shall be submitted and approved by the TCEQ. This AST plan shall provide an illustration that depicts the layout of the plant area including the AST facility, portable building, scale house, truck scale, secondary processing plant, rail siding and cement storage facility and any other structures on the transition zone.
- V. As stated in the WPAP application, a Texas Licensed Professional Geologist will conduct a quarterly survey of the pit area looking for geologic features. Records of the survey shall be maintained at the site and available for review by TCEQ staff for the life of the project.
- VI. As stated in the Westward Environmental, Inc. response dated June 13, 2007, the ranch roads located throughout the project site will not be widened or improved.

Mr. Jim Addams July 12, 2007

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JUL 12 2007

# COUNTY ENGINEER

- It is the responsibility of the applicant to comply with Chapter 11 of the Texas Water Code. This VII. letter does not provide authorization or approval for any regulations of the Watermaster Program of the TCEQ.
- This letter does not provide authorization or approval for any regulations of the U.S. Fish and VIII. Wildlife Service.

#### Best Management Practices

- 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 to meet the requirements of the TPDES General Permit No. TXR050000 Sector J. These may include vegetated filter strips, sediment traps, rock berms, silt fence rings, etc.
- Perimeter berms shall be inspected and maintained annually, or more often if necessary, to ensure functionality. Inspection and maintenance records shall be kept on site and available for review by TCEQ staff for the life of the project. The perimeter berms shall be maintained after closure of the site unless a modification to the approved WPAP is submitted and approved by the TCEQ.
- The BMPs for the plant site and stockpile area shall be operational prior to any crushing, XI. processing, washing, stockpiling, etc.
- XII. Inspection and maintenance records of temporary BMPs shall be kept on site for a period of three
- A copy of pages 1-35 through 1-60 of the TCEO TGM RG-348 (2005) shall be provided and kept XIII. on-site as a guide for soil stabilization. Temporary and/or permanent soil stabilization consistent with RG-348 (2005) shall be provided on all earthen berm structures
- XIV. All other temporary BMPs provided at the site shall conform to RG-348 (2005).
- XV. Any sediment deemed as waste or hazardous waste that is removed from any temporary BMP structure (silt fence, berms) or from the quarry pit area shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

#### Other

- XVI Pursuant to 30 TAC §213.4(j)(2&3), the holder of an approved Edwards Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating 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, and any development of land previously identified as undeveloped in the original water pollution abatement plan.
- Within 60 days of the date of this letter provide written confirmation that the three wells to be abandoned have been properly abandoned.
- Within 60 days of the date of this letter address the pipeline along the eastern boundary of the site. Disclose the contents and the owner of the pipeline and describe how the pipeline will be protected during the earthen berm construction.
- XIX. For clarification, feature recognition training will be provided for plant and quarry operators and personal. If a geologic feature is discovered by personal or operators, a Texas Licensed Professional Geologist shall further evaluate the feature and submit the required notifications and forms to the TCEQ.

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COUNTY ENGINEER

#### 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:

Mr. Jim Addams July 12, 2007

Page 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.
- 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.

#### During Construction:

- 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

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JUL 12 2007

Mr. Jim Addams July 12, 2007 Page 5

COUNTY ENGINEER

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.

- Six wells exist on site. All water wells, including injection, dewatering, and monitoring wells 10. 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.
- 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.
- 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:

- 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 14. Antonio Regional Office within 30 days of site completion.
- 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 San Antonio Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.
- Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the 16. 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.
- An Edwards Aquifer protection plan approval or extension will expire and no extension will be 17. 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.

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JUL 12 2007

Mr. Jim Addams July 12, 2007 Page 6

COUNTY ENGINEER

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 Charlyne Fritz of the Edwards Aquifer Protection Program of the San Antonio Regional Office at (210) 403-4065.

Sincerely,

Glenn Shankle

**Executive Director** 

Texas Commission on Environmental Quality

GS/CEF/eg

Enclosure:

Deed Recordation Affidavit, Form TCEQ-0625

Mr. Gary Nicholls, P.E., Westward Environmental, Inc. Mr. Bruce Boyer, City of New Braunfels Mr. Robert Potts, Edwards Aquifer Authority Mr. Tom Hornseth, Comal County

TCEQ Central Records, Building F, MC 212

Bryan W. Shaw, Ph.D., P.E., Chairman Toby Baker, Commissioner Zak Covar, Commissioner Richard A. Hyde, P.E., Executive Director



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution
May 6, 2015

Mr. Paul Detterline Capitol Aggregates, Inc. P.O. Box 33240 San Antonio, TX 78265

Re: Edwards Aquifer, Comal County

Name of Project: Capitol Aggregates, Inc. Solms Operations; Located along the north side of FM482, 0.75 miles west of the intersection of FM482 and Krueger Canyon; New Braunfels, Texas

Type of Plan: Request for the Approval of a Modification to a Water Pollution Abatement Plan (WPAP); 30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Regulated Entity No. RN10203939; Investigation No. 1227681; Additional ID No. 13-15021001

Dear Mr. Detterline:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the Modification of a WPAP application for the above-referenced project submitted to the San Antonio Regional Office by Westward Environmental, Inc. behalf of Capitol Aggregates, Inc. on February 10, 2015. Final review of the WPAP was completed after additional material was received on April 1, 2015. 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 Water Pollution Abatement Plan (WPAP) was approved by the TCEQ on July 12, 2007. The site consisted of 853 acres total over the Recharge Zone and 162 acres total over the Transition Zone. The total impervious cover for the site was to be 80 acres. Quarrying was to occur to an elevation no deeper than 25 feet above the maximum potentiometric surface of the Edwards Aquifer. The potentiometric surface is approximately 660 feet amsl in the southern portion and 680 feet amsl in

Mr. Paul Detterline May 6, 2015 Page 2

the northern portion. Project wastewater (domestic) will be collected in portable toilets and disposed of by a TCEQ registered waste disposal service.

#### PROJECT DESCRIPTION

The commercial project has an area of approximately 1,015 acres. Surface drainage from the Transition Zone flows away from the Recharge Zone. The overall site will have impervious cover of approximately 169 acres (16.7 percent of 1,015 acres). The WPAP Modification application proposes numerous modifications including the following; increase the total area to be mined from 613 acres to 700 acres, move the secondary crushing plant onto the Recharge Zone, construct a pre-check scale in the quarry pit, construct a shop/office building near the proposed plant entrance, and construct a hot mix asphalt plant and concrete batch plant. The quarry operation will install lined temporary settling ponds in the Recharge Zone and unlined ponds in the Transition Zone portion of the site. The unlined pond bottoms in the Transition Zone will be more than 100 feet above Edwards Limestone, for water and fines generated by the aggregate production washing process. The quarry pit will be excavated to an elevation of 685 feet amsl in the southern portion and 705 feet amsl in the northern portion of the site. Project wastewater will be captured through the use of portable toilets.

# PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, one wet basin, numerous engineered vegetated filter strips, and numerous natural vegetated filter strips, 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 required total suspended solids (TSS) treatment for this project is 79,796 pounds (79,796 pounds designed) of TSS generated from the 96 acres of impervious cover in the Recharge Zone. The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

A wet basin will be constructed to treat 65 acres of impervious cover. The required permanent pool volume, including 20% for sediment accumulation, is 1,108,570 cubic feet (1,108,570 cubic feet provided). The required detention volume is an additional 652,100 cubic feet. The TSS removal provided by the wet basin is 58,344 pounds annually. The wet basin was oversized to compensate for 10 acres of uncaptured impervious cover.

Numerous fifty foot natural vegetated buffer strips will remove 19,298 pounds of TSS from 21.5 acres of impervious cover. The fifty foot natural VFSs shall have a uniform slope of less than 10 percent and shall extend along the entire length of the contributing area.

Numerous engineered vegetated filter strips will remove 2,154 pounds of TSS from 2.4 acres of impervious cover. The vegetated filter strips shall have a uniform slope of less than 20 percent and vegetated cover of at least 80 percent which will extend along the entire length of the contributing area and will be free of gullies or rills that can concentrate overland flow. The contributing area shall be relatively flat to evenly distribute runoff, and the impervious cover in the direction of flow shall not exceed 72 feet.

#### **GEOLOGY**

According to the geologic assessment included with the application, the majority of the site is the exposed Person Formation and in the northern portion of the site, Buda Limestone, Del Rio Clay,

Mr. Paul Detterline May 6, 2015 Page 3

and Georgetown Formation were identified. The combined geologic and manmade features numbered 113; 19 of which were sensitive per the 2007 Geologic Assessment. The nineteen sensitive features consist of 6 zones (2 closed depression zones, 1 cave zone, 3 solution cavity zones), 3 swallow holes, 2 faults, 1 solution enlarged fracture, 2 caves, 3 solution cavities,1 well, and 1 manmade boring. The July 12, 2007 TCEQ approval letter indicated that sensitive features (S-21 sinkhole, S-23 solution cavity, S-36 cave, S-70 solution cavity, S-71 solution enlarged fractures, S-78 zone of solution cavities, and S-100 sinkhole) in the proposed quarry pit can be temporarily sealed and then mined out as the mining operation proceeds near the features. This application requests to temporarily seal and to mine through features; S-57 manmade boring; S-60 sinkhole; and S-83 water well. The features to be sealed are in addition to the features previously approved for temporary sealing and ultimate mine through. This request is approved. The San Antonio Regional Office did not conduct a site assessment.

# SPECIAL CONDITIONS

The request to cease performance of quarterly geologic assessments by a Registered
Professional Geoscientist is approved based on your submission of a suitable annual training
program, employee observations, and recordkeeping program. Retain records of employee
training and of visual observations made by site employees for a period of five years from the
date of training and of observations. Records shall be presented to TCEQ upon request.

2. As proposed, either flowable fill or concrete will be utilized to temporarily seal sensitive features within the quarry pit.

3. The approved permanent pollution abatement measures shall be operational prior to the installation of new impervious cover within their respective drainage area.

4. All sediment and/or media removed from the permanent pollution abatement measures during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

5. This modification is subject to all Special and Standard Conditions listed in the WPAP approval letter dated July 12, 2007.

# 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

Mr. Paul Detterline May 6, 2015 Page 4

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.

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- 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. Eleven water wells/boreholes are located on-site, however, two have been previously plugged and abandoned. 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 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:

- 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 San Antonio

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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.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Mr. Michael Isley, P.E. of the Edwards Aquifer Protection Program of the San Antonio Regional Office at 210-403-4057.

Sincerely,

Lynn Bumguardner, Water Section Manager

San Antonio Region

Texas Commission on Environmental Quality

LMB/MI/eg

Enclosure: Deed Recordation Affidavit, Form TCEQ-0625

Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

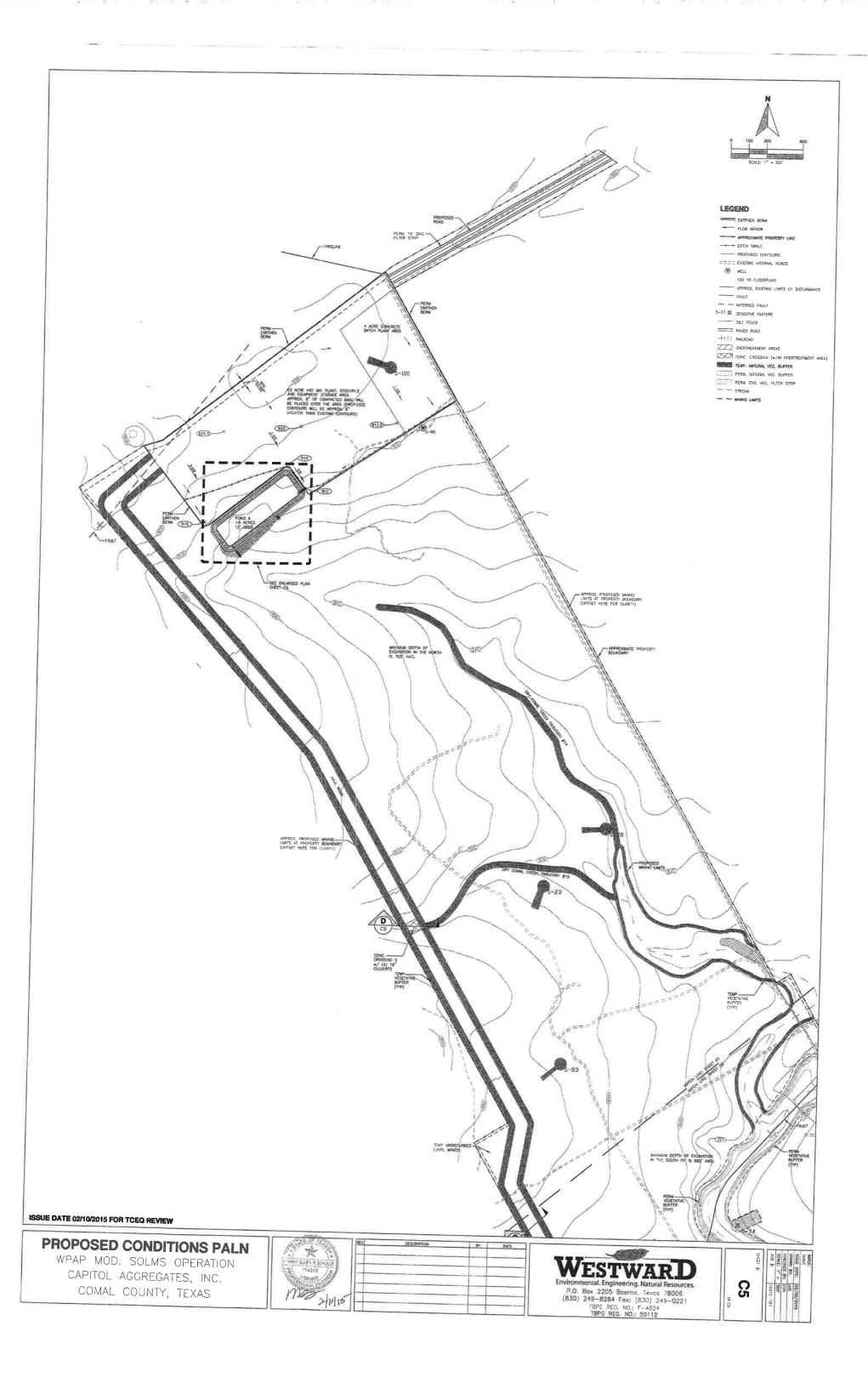
cc: Ms. Mary Ellen Schulle, P.E., Westward Environmental, Inc.

Mr. Thomas Hornseth, P.E., Comal County Engineer Mr. Charlie Thomas, P.E., City of New Braunfels

Mr. Roland Ruiz, General Manager, Edwards Aquifer Authority

TCEQ Central Records, Building F, MC 212





# Water Pollution Abatement Plan Application

**Texas Commission on Environmental Quality** 

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

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

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

# Signature

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

Print Name of Customer/Agent: <u>J. Brandon Klenzendorf, P.E.</u>	2000000
Date: 9.17.2018	ESTATE OF THE PARTY OF THE PART
Signature of Customer/Agent:	1 / DI \13
	J. BRANDON KLENZENDORF
J. Brandon Kleyerdal	113007 CENSE
Regulated Entity Name: Capitol Aggregates Solms Operation	POR SOLONIE EN

# Regulated Entity Information

1.	The type of project is:
	Residential: Number of Lots: Residential: Number of Living Unit Equivalents:
	Commercial
	Other:

- 2. Total site acreage (size of property): 1,015 acres
- 3. Estimated projected population: 25 employees
- 4. The amount and type of impervious cover expected after construction are shown below:

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	13,939	÷ 43,560 =	0.32
Parking		÷ 43,560 =	
Other paved surfaces	3,566,693	÷ 43,560 =	81.88
Total Impervious Cover	3,580,632	÷ 43,560 =	82.2

Total Impervious Cover  $82.2 \div$  Total Acreage 1,015 X 100 = 8.1% Impervious Cover

5.	Attachment A - Factors Affecting Surface Water Quality. A detailed description of all
	factors that could affect surface water and groundwater quality that addresses ultimate
	land use is attached.

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

# For Road Projects Only

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

7.	Type of project:
	<ul> <li>TXDOT road project.</li> <li>County road or roads built to county specifications.</li> <li>City thoroughfare or roads to be dedicated to a municipality.</li> <li>Street or road providing access to private driveways.</li> </ul>
8.	Type of pavement or road surface to be used:
	Concrete Asphaltic concrete pavement Other:
9.	Length of Right of Way (R.O.W.): feet.
	Width of R.O.W.: feet. $L \times W = Ft^2 \div 43,560 Ft^2/Acre = acres.$
10.	Length of pavement area: feet.
	Width of pavement area: feet. L x W = $Ft^2 \div 43,560 Ft^2/Acre = acres$ . Pavement area acres $\div$ 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.

TCEQ Executive Director. Mod	isting roadways that do not require approval from the difications to existing roadways such as widening ng more than one-half (1/2) the width of one (1) existing om the TCEQ.
Stormwater to be gene	rated by the Proposed Project
volume (quantity) and charact occur from the proposed proj quality and quantity are based	Character of Stormwater. A detailed description of the ter (quality) of the stormwater runoff which is expected to ect is attached. The estimates of stormwater runoff d on the area and type of impervious cover. Include the or both pre-construction and post-construction conditions.
Wastewater to be gene	erated by the Proposed Project
14. The character and volume of was	tewater is shown below:
100% Domestic 0% Industrial 0% Commingled TOTAL gallons/day 50 (to be o	<u>50</u> Gallons/day <u>O</u> Gallons/day <u>O</u> Gallons/day lisposed off-site or via proposed septic tank)
15. Wastewater will be disposed of b	y:
On-Site Sewage Facility (OSSF)	/Septic Tank):
will be used to treat and delicensing authority's (authority's (authority's (authority) the land is suitable for the the requirements for on-site Sewage Each lot in this project/desize. The system will be delicented.	Letter from Authorized Agent. An on-site sewage facility lispose of the wastewater from this site. The appropriate orized agent) written approval is attached. It states that use of private sewage facilities and will meet or exceed ite sewage facilities as specified under 30 TAC Chapter 285 e Facilities.  Velopment is at least one (1) acre (43,560 square feet) in esigned by a licensed professional engineer or registered a a licensed installer in compliance with 30 TAC Chapter
Sewage Collection System (Se	wer Lines):
to an existing SCS.	m the wastewater generating facilities will be connected m the wastewater generating facilities will be connected
<ul><li>The SCS was previously su</li><li>The SCS was submitted wi</li><li>The SCS will be submitted be installed prior to Execu</li></ul>	th this application. at a later date. The owner is aware that the SCS may not

	The sewage collection system will convey the wastewater to the (name) Treatment Plant. The treatment facility is:
	Existing. Proposed.
16.	All private service laterals will be inspected as required in 30 TAC §213.5.
Si	ite Plan Requirements
Ite	ms 17 – 28 must be included on the Site Plan.
17.	$\square$ The Site Plan must have a minimum scale of 1" = 400'.
	Site Plan Scale: 1" = <u>400' at half size</u> , <u>11"x17"</u> .
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): Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Comal County, Texas and Incorporated Areas, map number 48091C0440F
	effective 2 September 2009 and Letter of Map Revision (LOMR) 13-06-2849P effective 5
	May 2014.
19.	The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Lots, recreation centers, buildings, roads, open space, etc. are shown on the plan.
	The layout of the development is shown with existing contours at appropriate, but not greater than ten-foot intervals. Finished topographic contours will not differ from the existing topographic configuration and are not shown. Lots, recreation centers, buildings, roads, open space, etc. are shown on the site plan.
20.	All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):
	There are 10 (three of which have been plugged as indicated on the Geologic  Assessment Table) (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply)
	<ul><li>☐ The wells are not in use and have been properly abandoned.</li><li>☐ The wells are not in use and will be properly abandoned.</li><li>☐ The wells are in use and comply with 16 TAC §76.</li></ul>
	There are no wells or test holes of any kind known to exist on the project site.
21.	Geologic or manmade features which are on the site:
	All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.

	No sensitive geologic or manmade features were identified in the Geologic Assessment.
	Attachment D - Exception to the Required Geologic Assessment. A request and justification for an exception to a portion of the Geologic Assessment is attached.
22. 🖂	The drainage patterns and approximate slopes anticipated after major grading activities
23. 🖂	Areas of soil disturbance and areas which will not be disturbed.
24. 🔀	Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.
25. 🖂	Locations where soil stabilization practices are expected to occur.
26. 🖂	Surface waters (including wetlands).
	N/A
27. 🔀	Locations where stormwater discharges to surface water or sensitive features are to occur.
	There will be no discharges to surface water or sensitive features.
28. 🔀	Legal boundaries of the site are shown.
Adm	ninistrative Information
29. 🔀	Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
30. 🔀	Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

#### Water Pollution Abatement Plan Form (TCEQ-0584) Supplemental Information

Based on discussions with TCEQ staff, only information associated with the proposed modifications to the original WPAP and previously approved WPAP modification are required on form TCEQ-0584. For clarity, information from the original approved WPAP and/or previously approved WPAP modification is also included where no changes/modifications are proposed.

The Impervious Cover Table in item 4 of form TCEQ-0584 refers to the entire property as opposed to only the area associated with this WPAP modification. 86.8 acres of impervious cover are proposed to be removed from the site as a result of this WPAP modification. Item 19 of form TCEQ-0584 indicates that finished contours will not differ from the existing topographic configuration; this response was selected based on the previously approved WPAP modification which indicated the "final contours are unknown at this time; the final floor elevation will depend on several variables such as rock quality and operational considerations unforeseeable at this time. However, it is anticipated that the final elevation will be 25 feet above the groundwater level (approx. 685 ft in the southern pit and 705 ft in the northern pit)." Modifications to this information are not proposed as part of this WPAP modification request.

#### Attachment A – Factors Affecting Surface Water Quality

The major factor that could potentially affect surface water and groundwater quality is sediment in stormwater runoff due to the clearing of vegetation, stockpiles, and initial rock crushing and screening processes. Another factor that could potentially affect water quality is leaking oils, fuels, and lubricants from aboveground storage tanks, the equipment fueling and maintenance area, or construction vehicles on the site. In addition, trash and construction debris are minor factors affecting surface water quality.

In accordance with the previously approved WPAP modification, temporary and permanent BMPs (earthen berms, rock berms, natural vegetated buffers, engineered vegetated filter strips, temporary silt fencing, and mulch) located downgradient of the disturbed area(s) are approved to treat sediment and control the flow of stormwater runoff. Vehicle maintenance and fueling will be performed in the shop/fueling area near the main entrance, located as shown on the previously approved "Proposed Conditions Plan". Large, slow moving equipment may be fueled or have emergency maintenance performed within the pit. Spill kits will be kept readily available and may include drip pans, absorbent pads, base material, etc. Excavation equipment on-site may be used to construct temporary berms in response to spills. If quarrying requires the maintenance/fueling area to be relocated, a similar base pad and berm will be constructed at a location to be determined

at that time. Any spills or leaks will be cleaned up in a timely manner and will be disposed of properly. A trash receptacle will be placed on-site for use by employees and visitors.

#### Attachment B - Volume and Character of Stormwater

As described in the previously approved WPAP modification, stormwater from disturbed areas may carry an increased level of total suspended solids (TSS); however, temporary and permanent BMPs including downgradient earthen berms, rock berms, and silt fencing will intercept and retain/treat this stormwater flow. The rock berms will filter stormwater runoff before it flows from the active project areas. The proposed temporary and permanent 25-foot vegetated buffer on both sides of Dry Comal Creek and tributaries will also serve to treat stormwater runoff. Temporary BMPs such as mulch and natural vegetated areas will be used where feasible to control and filter runoff from paved areas of the site.

Due to the use of these temporary BMPs during construction, the character of stormwater runoff from the proposed project is expected to be essentially the same as prior to the proposed project. As quarrying activities continue, the volume of stormwater runoff will be reduced because the quarry pit will ultimately retain the anticipated on-site and upgradient stormwater runoff.

This WPAP modification request proposes to remove the previously approved wet basin due to the removal of upgradient impervious surfaces. The wet basin was designed to provide "overtreatment for the (stream) crossings and paved areas of the entrance road". As a result of this WPAP modification, Stream Crossing 2 will be removed and Stream Crossings 1 and 3 are proposed to be treated with engineered vegetated filter strips. Furthermore, permanent engineered vegetated filter strips are proposed for the entrance road to the quarry.

The average annual runoff coefficient for all impervious areas is assumed to be 0.9, and the average annual runoff coefficient for landscaped or natural areas is assumed to be 0.03 according to TCEQ RG-348 *Complying with the Edwards Aquifer Rules* (TCEQ, 2005). The average annual runoff coefficient for the disturbed quarry is 0.75 according to the previously approved WPAP modification. The composite average annual runoff coefficient for the entire 1,015-acre site prior to any development is approximately 0.03. The post-development average annual runoff coefficient is expected to increase slightly due to the additional impervious area of 82.2 acres. The composite post-development average annual runoff coefficient for the entire 1,015-acre site is approximately 0.59. However, since the quarry pit will retain all stormwater runoff, the overall volume of stormwater runoff is expected to decrease for post-development conditions.

The volume of stormwater runoff from the Site was calculated for a 100-year, 24-hour duration rainfall event. Based on Atlas of Depth-Duration Frequency of Precipitation Annual Maxima for Texas (USGS 2004), the rainfall depth for a 100-year, 24-hour event at the site is approximately 10.1 in. A design event runoff coefficient was selected using Hydraulic Design Manual (TxDOT, 2014) for rural watersheds. A pre-development design event runoff coefficient of 0.54 was selected to represent relatively flat land with average slopes less than 10%, low infiltration capacity soils having fair vegetative cover, and few or shallow surface depressions. The calculated volume of stormwater runoff for pre-development conditions is  $0.54 \times 10.1$  in.  $\times 1,015$  acres = 461.3 acft. As previously mentioned, the additional impervious cover provided by the approved buildings and support activity areas is expected to increase the runoff coefficient for post-development conditions, but the quarry pit will retain all stormwater runoff from the pit area which will ultimately include support areas. Since the ultimate quarry area is 689.4 acres, the remaining area subject to stormwater runoff is 325.6 acres. This area is expected to have a runoff coefficient slightly higher than pre-development conditions due to the stream crossings; a runoff coefficient of 0.59 was assumed for this analysis. The calculated volume of stormwater runoff would be 0.59  $\times$  10.1 in.  $\times$  325.6 acres = 161.7 ac-ft, which is less than the volume calculated above for predevelopment conditions. Therefore, volume of stormwater runoff is expected to decrease for postdevelopment conditions.

Due to the use of temporary and permanent BMPs identified in the previously approved WPAP modification as well as this WPAP modification request, the character (i.e., quality) of stormwater runoff from the project is expected to be essentially the same as prior to the quarrying operations. The character of stormwater is assumed to have an average total suspended solids (TSS) concentration of 80 mg/L for undeveloped or landscaped areas and 170 mg/L for paved or impervious areas. Permanent BMPs such as natural vegetated buffers, vegetated filter strips, and vegetated earthen berms will be utilized to reduce the discharge of pollutants.

#### <u>Attachment C – Suitability Letter from Authorized Agent</u>

Temporary restroom facilities are provided for employees and guests and properly maintained, as needed, by a licensed waste collector. In addition, an on-site sewage facility (OSSF) will be used at the site for the scale house over the Edwards Aquifer Transition Zone. An On-Site Sewage Facility Suitability Letter from the Office of Comal County Engineer dated 22 March 2018 is included as an attachment. The Suitability Letter states that the land is suitable for the use of private sewage facilities as specified under 30 TAC Chapter 285 in the proposed location of the OSSF near the scale house.

## <u>Attachment D – Exception to the Required Geologic Assessment</u>

All geologic or manmade features identified in the Geologic Assessment are shown and labeled. An Exception to the Required Geologic Assessment is not required.



# **Comal County**

OFFICE OF COMAL COUNTY ENGINEER

March 22, 2018

Brandon Klenzendorf, P.E. Geosyntec Consultants, Inc. 8217 Shoal Creek Blvd., Suite 200 Austin, TX 78757

Re:

Capitol Aggregates On-Site Sewage Facility Suitability Letter, within Comal County,

Texas

Dear Mr. Klenzendorf:

In accordance with TAC §213.5(b)(4)(F)(ii), Comal County has found that the entire referenced site (except for areas listed below) is suitable for the use of private sewage facilities and will meet the special requirements for on-site sewage facilities located on the Edwards Aquifer recharge zone as specified in TAC §285.40-42 based on the following information submitted to our office on March 21, 2018:

Geologic Assessment, prepared by Westward Environmental, Inc.

#### Areas that are not Suitable

The Geologic Assessment identified 1 water well as sensitive. Below is a list of said sensitive feature:

Feature ID	Latitude	Longitude	Feature ID	Latitude	Longitude
S-21	29°40.05'	98° 12.8'	S-69	29°40.12'	98° 12.46'
S-23	29°39.98'	98° 12.63'	S-70	29°40.23'	98° 12.43'
S-29	29°40.11'	98° 12.58'	S-71	29°40.25'	98° 12.42'
S-36	29°40.14'	98° 12.88'	S-72	29°40.11'	98° 12.55'
S-50	29°40.25'	98° 12.86'	S-73	29° 40.8'	98 ° 12.8'
S-52	29°40.31'	98° 12.72'	S-74	29°41.26'	98° 12.88'
S-53	29°40.29'	98° 12.78'	S-78	29°41.14'	98° 13.15'
S-57	29°40.56'	98° 13.03'	S-83	29°40.82'	98° 13.21'
S-60	29°40.38'	98° 12.86'	S-100	29°41.77'	98° 13.5'
S-64	29°40.46'	98° 12.67'	S-102	29°40.18'	98° 12.61'

Minimum required separation distances are outlined in TAC 285.91 (Table X). These separation distances are required to be complied with.

Finally, according to TAC §285.42(a), if any recharge feature, not listed above, is discovered during construction of an OSSF, all regulated activities near the feature shall be suspended immediately. The owner shall immediately notify the TCEQ San Antonio office of the discovery of the feature. All

# Comal County

OFFICE OF COMAL COUNTY ENGINEER

Mr. Klenzendorf March 22, 2018 Page 2

activities regulated under TAC §213 shall not proceed near the feature until Comal County, in conjunction with the TCEQ San Antonio office, has reviewed and approved a plan proposed to protect the feature, the structural integrity of the OSSF, and the water quality of the aquifer. The plan shall be sealed, signed, and dated by a professional engineer.

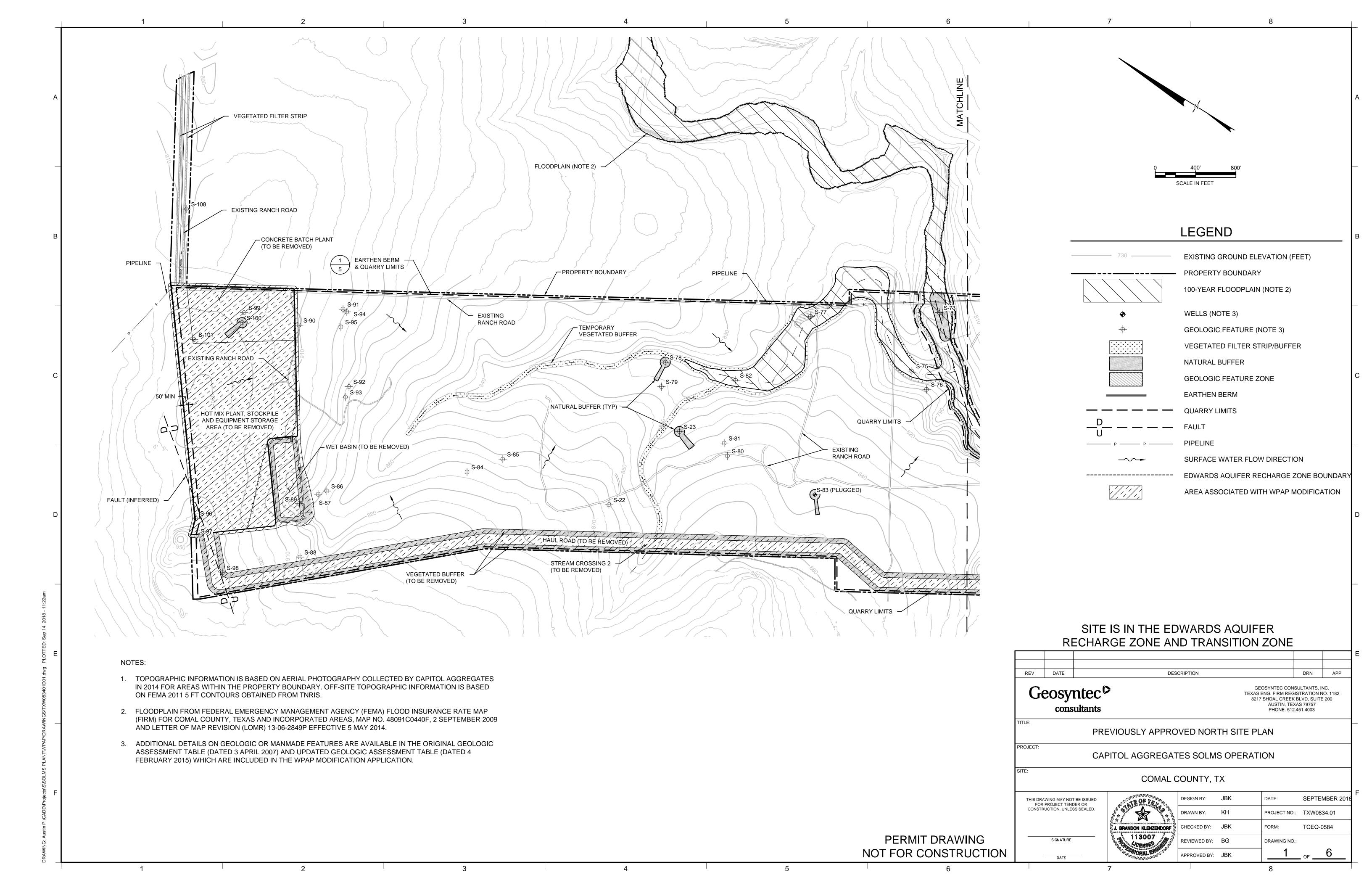
If you have any questions or need additional information, please do not hesitate to contact our office.

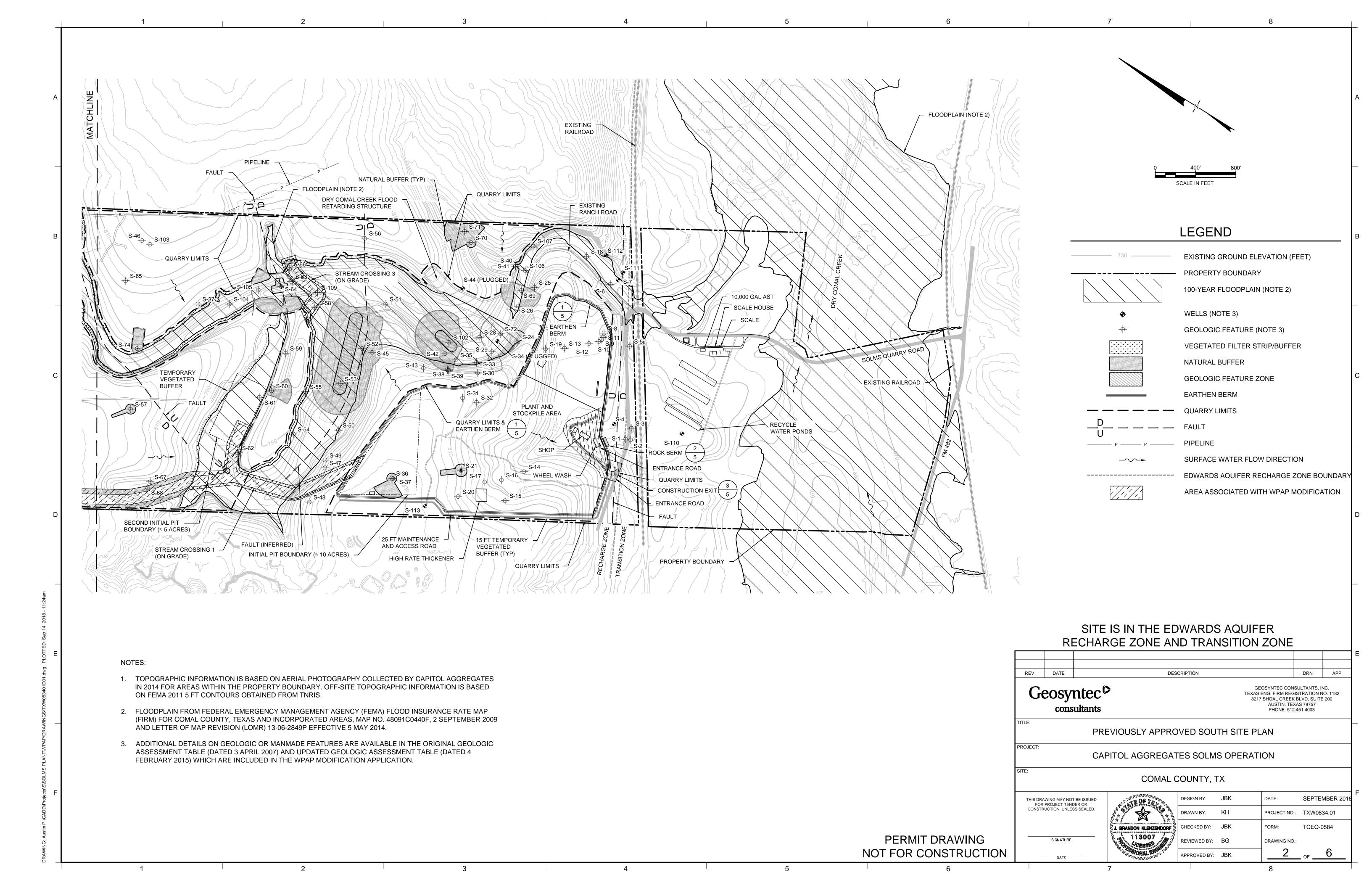
Sincerely,

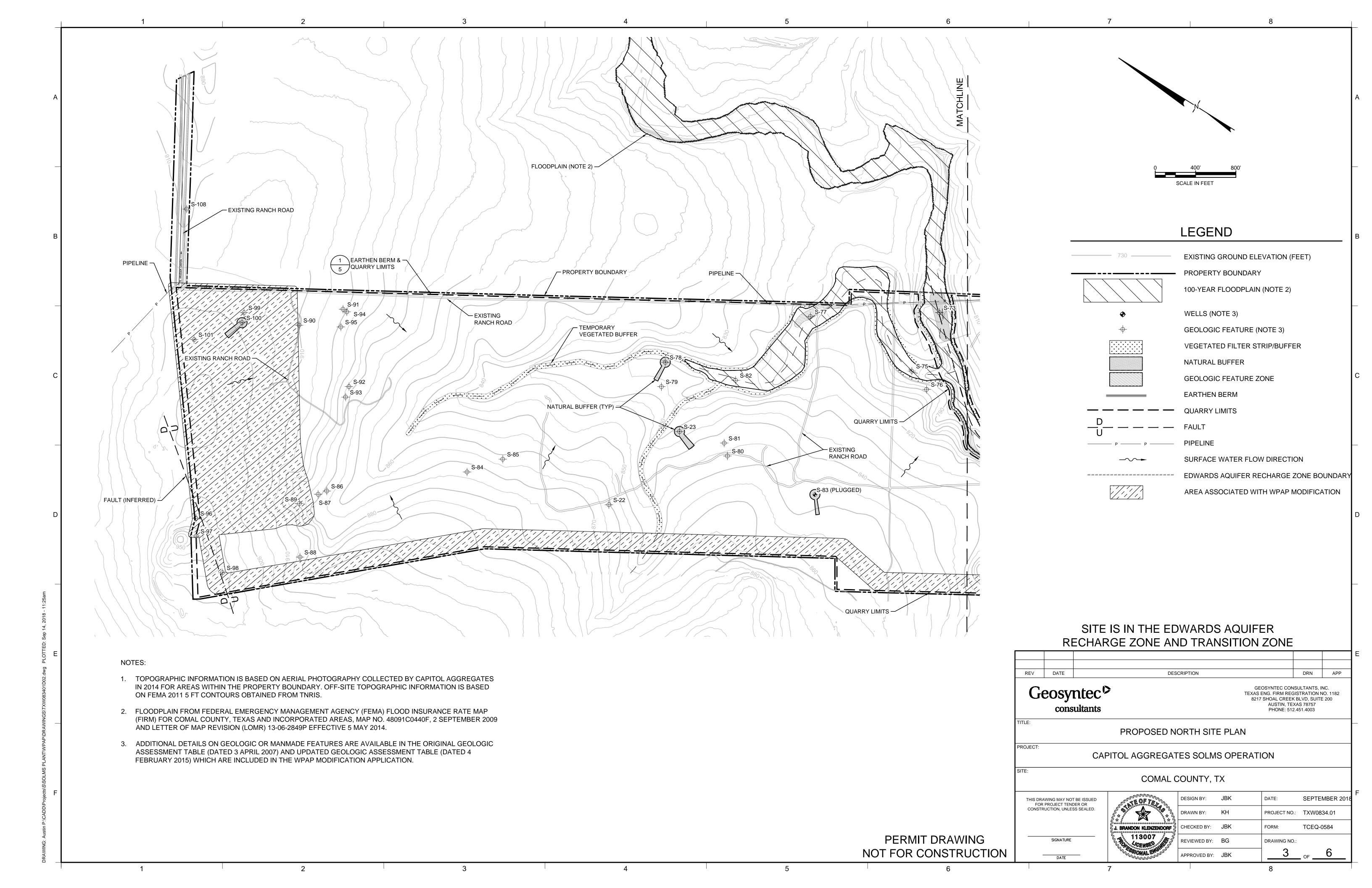
Robert Boyd, P.E.

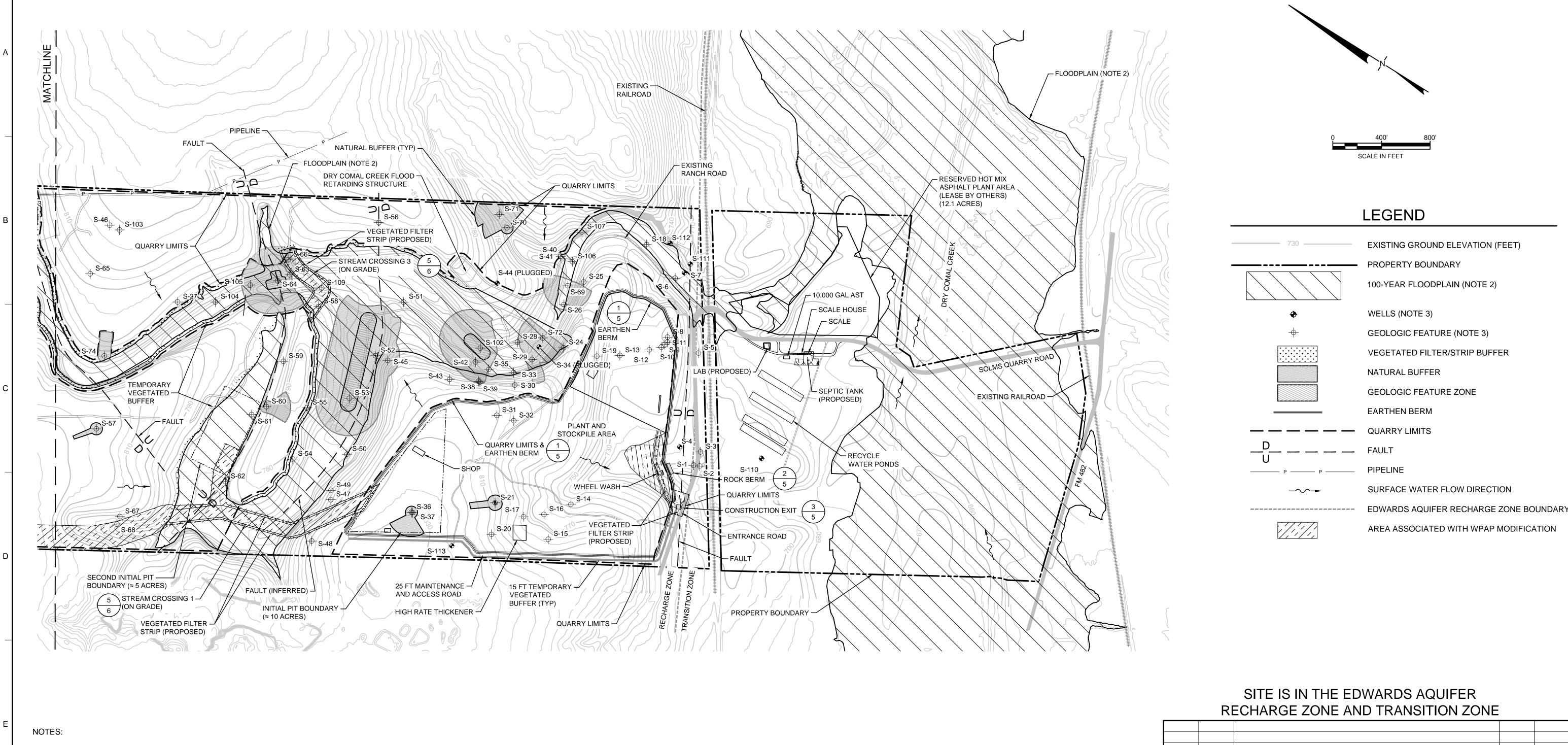
Comal County Assistant Engineer

cc: Scott Haag, Comal County Commissioner Precinct No. 2





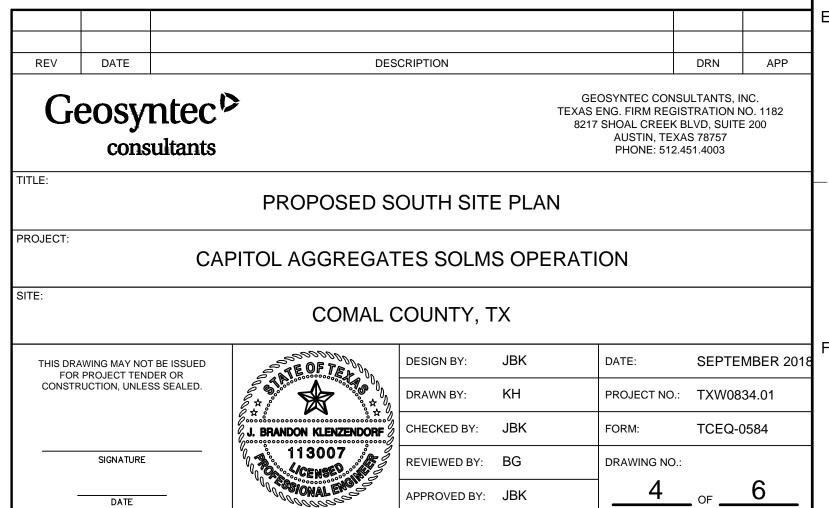




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- 2. FLOODPLAIN FROM FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) FOR COMAL COUNTY, TEXAS AND INCORPORATED AREAS, MAP NO. 48091C0440F, 2 SEPTEMBER 2009 AND LETTER OF MAP REVISION (LOMR) 13-06-2849P EFFECTIVE 5 MAY 2014.
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TOTAL AREA INCLUDING BMP, AC (AC)	7.75	5.00	1.52
IMPERVIOUS AREA DRAINING TO BMP, A <sub>I</sub> (AC)	2.62	1.63	0.75
REQUIRED TSS LOAD REMOVAL, LM (LB)	2,352	1,463	673
TSS LOAD REMOVED BY BMP, LR (LB)	2,620	1,633	740

PERMIT DRAWING NOT FOR CONSTRUCTION



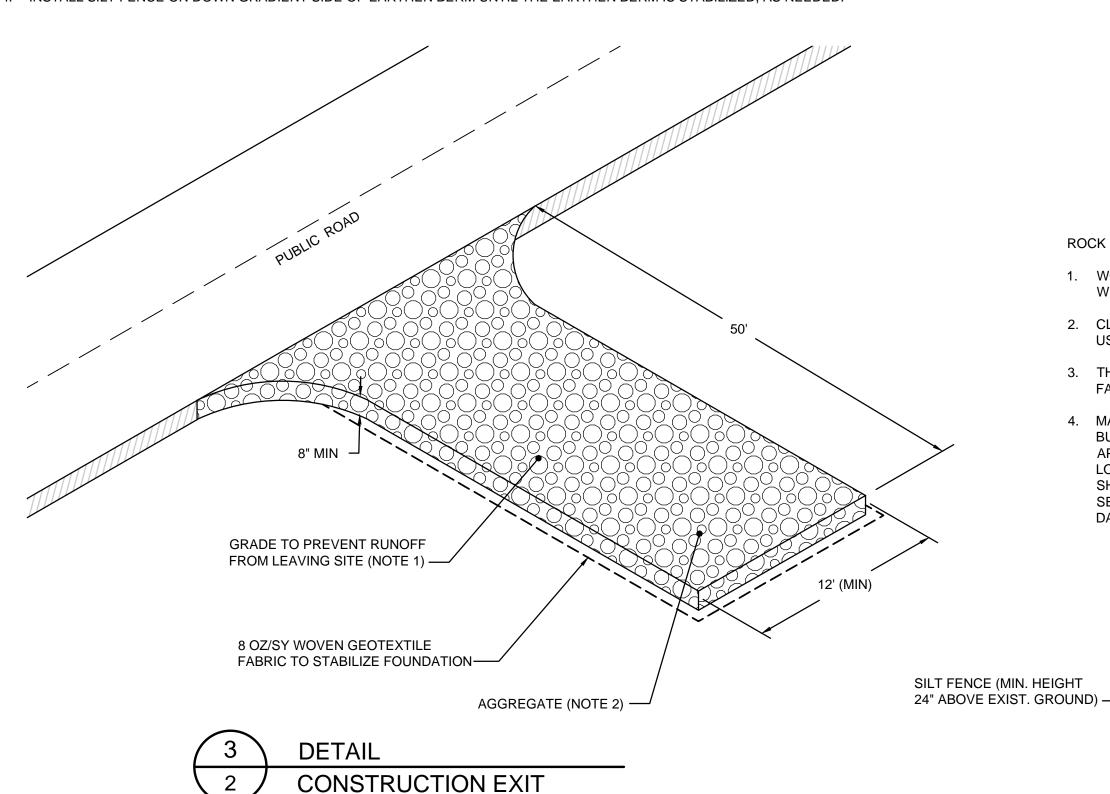
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# **EARTHEN BERM NOTES:**

- 1. REMOVE ANY EXISTING VEGETATION AND SCARIFY OR BENCH IN ADJACENT SOILS PRIOR TO PLACING BERM.
- 2. EARTHEN BERM SHALL BE ADEQUATELY COMPACTED AND STABILIZED WITH NATIVE VEGETATION OR OTHER APPROVED STABILIZATION METHOD.
- 3. MAINTENANCE REQUIREMENTS INCLUDE INSPECTION FOR EROSION WHICH SHALL BE BACKFILLED AND COMPACTED AS SOON AS POSSIBLE WHEN EROSION IS OBSERVED. IF THE VEGETATED COVER IS LESS THAN 80%, THE BERM SHALL BE STABILIZED OR RESEEDED.
- 4. INSTALL SILT FENCE ON DOWN GRADIENT SIDE OF EARTHEN BERM UNTIL THE EARTHEN BERM IS STABILIZED, AS NEEDED.



REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FOUNDATION FOR

THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG. INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER

4. THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC

5. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY

1. ALL ON-SITE TOPSOIL MUST BE PRESERVED FOR REUSE ON THE SITE DURING REVEGETATION, UNLESS IT IS INFEASIBLE OR

2. ALL SOIL STOCKPILES MUST BE STABILIZED TO PREVENT EROSION AND FUGITIVE DUST. THE SURFACE OF THE STOCKPILE MUST

3. PERIMETER SEDIMENT CONTROLS SUCH AS SILT FENCING ALSO MUST BE INSTALLED AT STOCKPILE LOCATIONS TO PREVENT

4. STOCKPILES MUST BE LOCATED OUTSIDE OF ANY VEGETATED BUFFER AREAS AND SHOULD BE LOCATED AS FAR AS PRACTICABLE

BE PROPERLY PROTECTED TO ELIMINATE THE RISK OF EROSION. SUITABLE ALTERNATIVE MEANS OF STABILIZATION CAN BE USED,

2. AGGREGATE SHOULD CONSIST OF 4 TO 8 INCH WASHED STONE PLACED WITH A MINIMUM THICKNESS OF 8 INCHES.

RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND.

SCALE: N.T.S.

CONSTRUCTION ENTRANCE NOTES:

POSITIVE DRAINAGE.

PUBLIC ROAD DRAINAGE.

QUARRY OPERATOR.

UNREASONABLE TO DO SO.

SUCH AS PROPERLY ANCHORED PLASTIC TARPS.

CONTACT WITH STORM WATER, INCLUDING RUN-ON.

FROM STORM WATER CONVEYANCES AND IMPOUNDMENTS AND WATER BODIES.

STOCKPILE NOTES:

# ROCK BERM AND HIGH SERVICE ROCK BERM NOTES:

**CLEAN OPEN** 

(NOTE 2)

**GRADED ROCK** 

- WOVEN WIRE SHEATHING SHALL HAVE A MAXIMUM OPENING OF ONE INCH AND A MINIMUM WIRE DIAMETER OF 20 GAUGE GALVANIZED WIRE, AND BE SECURED WITH SHOAT RINGS.
- 2. CLEAN OPEN GRADED ROCK WITH DIAMETERS RANGING FROM 3 TO 5 INCHES SHALL BE
- 3. THE BERM SHALL BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.

- STEEL FENCE POST MAX. 8' SPACING,

CROSS-SECTION

**WOVEN WIRE** 

SHEATHING (NOTE 1)

**WOVEN WIRE** 

CLEAN OPEN

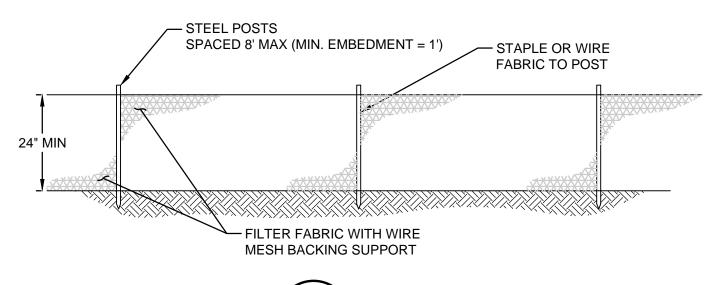
SHEATHING (NOTE 1)

GRADED ROCK (NOTE 2)

3 TO 4 INCHES (NOTE 3)

MAINTENANCE REQUIREMENTS INCLUDE REMOVING SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES SIX INCHES AND DISPOSE OF THE ACCUMULATED SEDIMENT IN AN APPROVED MANNER THAT WILL NOT CAUSE ANY ADDITIONAL SEDIMENTATION. REPAIR ANY LOOSE WIRE SHEATHING. RESHAPE THE BERM AS NEEDED DURING INSPECTION. THE BERM SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SEDIMENT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

# MIN. EMBEDMENT = 1' - WIRE MESH BACKING SUPPORT 4 X 4 -W1.4 X W1.4 MINIMUM ALLOWABLE, TYP. COMPACTED EARTH BACKFILL - FABRIC TOE-IN





## **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
- 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 SHALL BE 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 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:
- 12.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:
- 12.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;
- 12.C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

SAN ANTONIO REGIONAL OFFICE 14250 JUDSON ROAD SAN ANTONIO, TEXAS 78233-4480 PHONE: (210) 490-3096 FAX: (210) 545-4329

# SILT FENCE NOTES:

- 1. THE MAXIMUM DRAINAGE AREA TO THE SILT FENCE SHALL NOT EXCEED THE MANUFACTURER'S RECOMMENDATION, BUT IN NO CASE SHALL THE DRAINAGE AREA BE GREATER THAN 0.5 ACRE PER 100 FT. SILT FENCE MAY NOT BE USED IN AREAS OF CONCENTRATED FLOW (FOR EXAMPLE, DITCHES AND CHANNELS).
- SILT FENCE MATERIAL SHOULD 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/IN<sup>2</sup>, ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NO. 30.
- 3. FENCE POSTS SHOULD 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<sup>2</sup>, AND BRINDELL HARDNESS EXCEEDING 140.
- 4. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.
- 5. THE TOE OF THE SILT FENCE SHOULD 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. 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.
- SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHOULD BE A 3-FOOT OVERLAP, SECURELY FASTED WHERE ENDS OF FABRIC MEET
- 7. REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES. REPLACE ANY TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION, REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.

PERMIT DRAWING NOT FOR CONSTRUCTION

# SITE IS IN THE EDWARDS AQUIFER RECHARGE ZONE AND TRANSITION ZONE

REV DATE DESCRIPTION DRN GEOSYNTEC CONSULTANTS, INC. Geosyntec<sup>15</sup> TEXAS ENG. FIRM REGISTRATION NO. 1182 8217 SHOAL CREEK BLVD, SUITE 200 AUSTIN. TEXAS 78757 consultants PHONE: 512.451.4003 CONSTRUCTION NOTES AND DETAILS I PROJECT: CAPITOL AGGREGATES SOLMS OPERATION COMAL COUNTY, TX

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED. J. BRANDON KLENZENDORF 113007

SEPTEMBER 201 DESIGN BY: JBK DRAWN BY: KH PROJECT NO.: TXW0834.01 CHECKED BY: JBK TCEQ-0584 EVIEWED BY: BG DRAWING NO. K/Censed APPROVED BY: JBK

DATE

SIGNATURE

MINIMUM 15-FT VEGETATED
FILTER STRIP (NOTE 1)

GRAVEL STREAM CROSSING

MINIMUM 15-FT VEGETATED
FILTER STRIP (NOTE 1)

2%

2%

ENGINEERED SWALE (TYP)

15' (MIN)

SECTION

VEGETATED FILTER STRIP

FOR STREAM CROSSINGS

# VEGETATED FILTER STRIP NOTES:

 THE FILTER STRIP SHOULD EXTEND ALONG THE ENTIRE LENGTH OF THE CONTRIBUTING AREA. THE CONTRIBUTING AREA DRAINING TO THE VEGETATED FILTER STRIP WILL BE LIMITED TO NO MORE THAN 72 FEET.

SCALE: N.T.S.

2. THE FILTER STRIP SLOPE SHOULD NOT EXCEED 10%.

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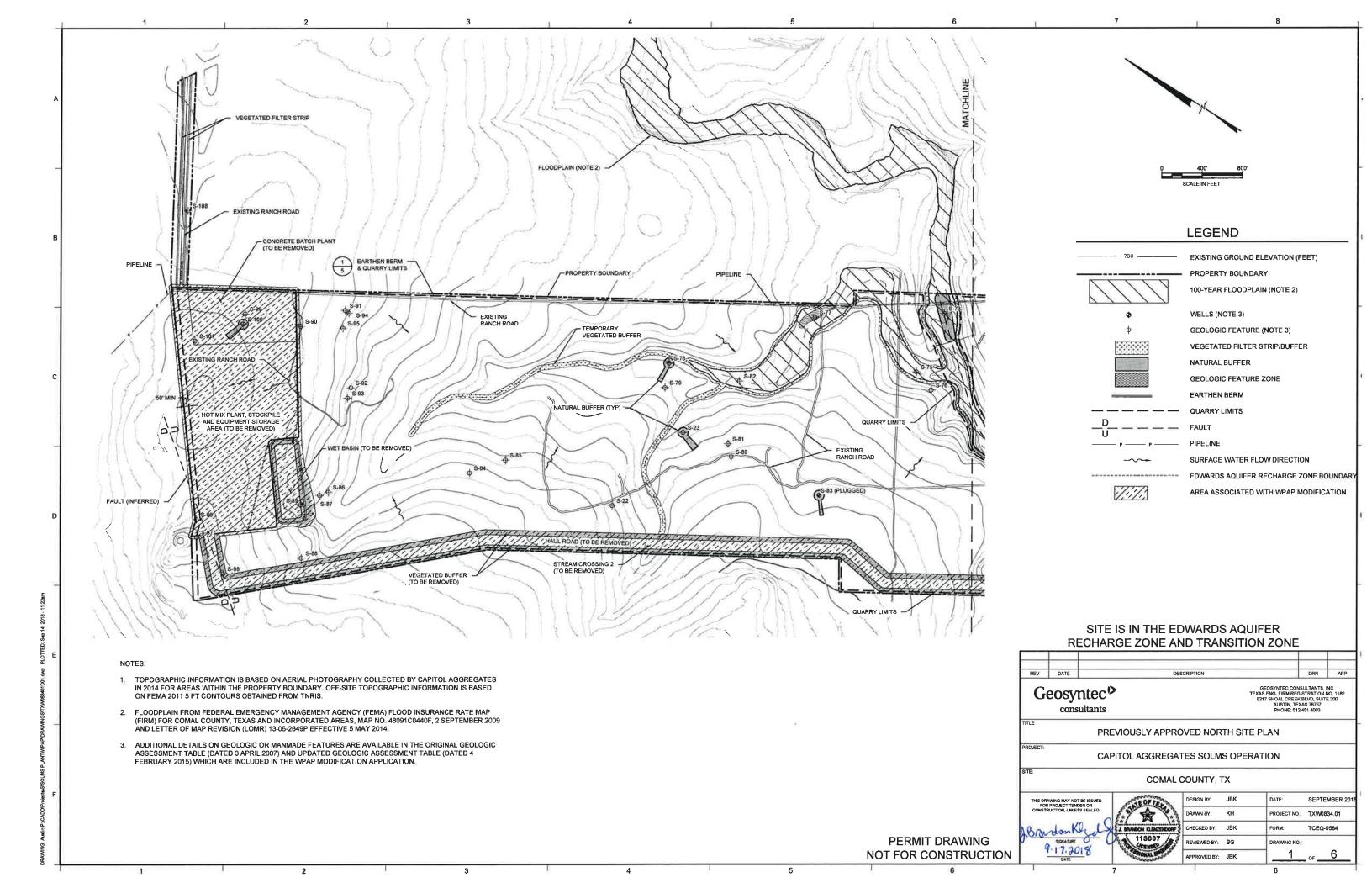
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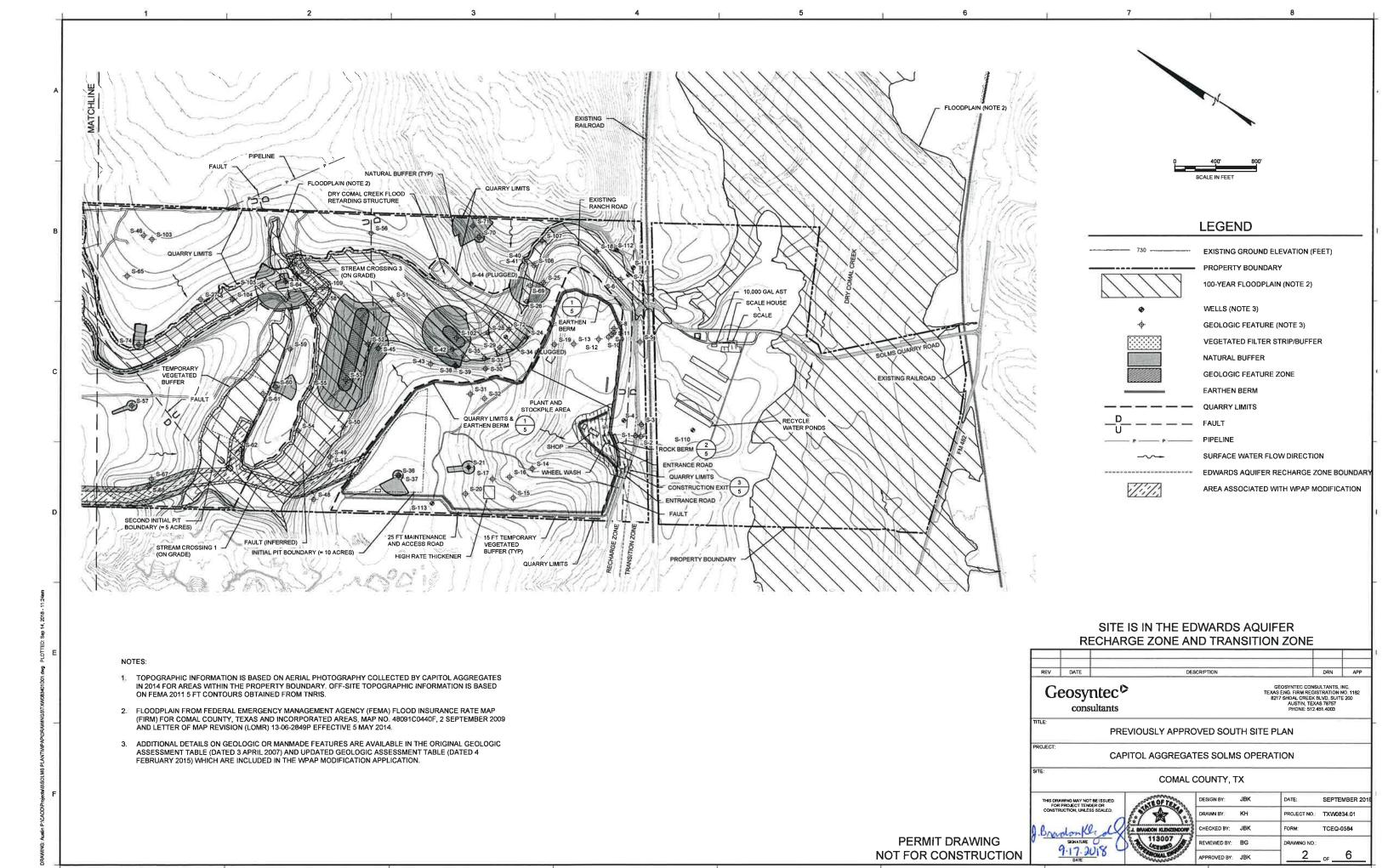
NG: Austin P:\CADD\Projects\S\SOLMS PLAN

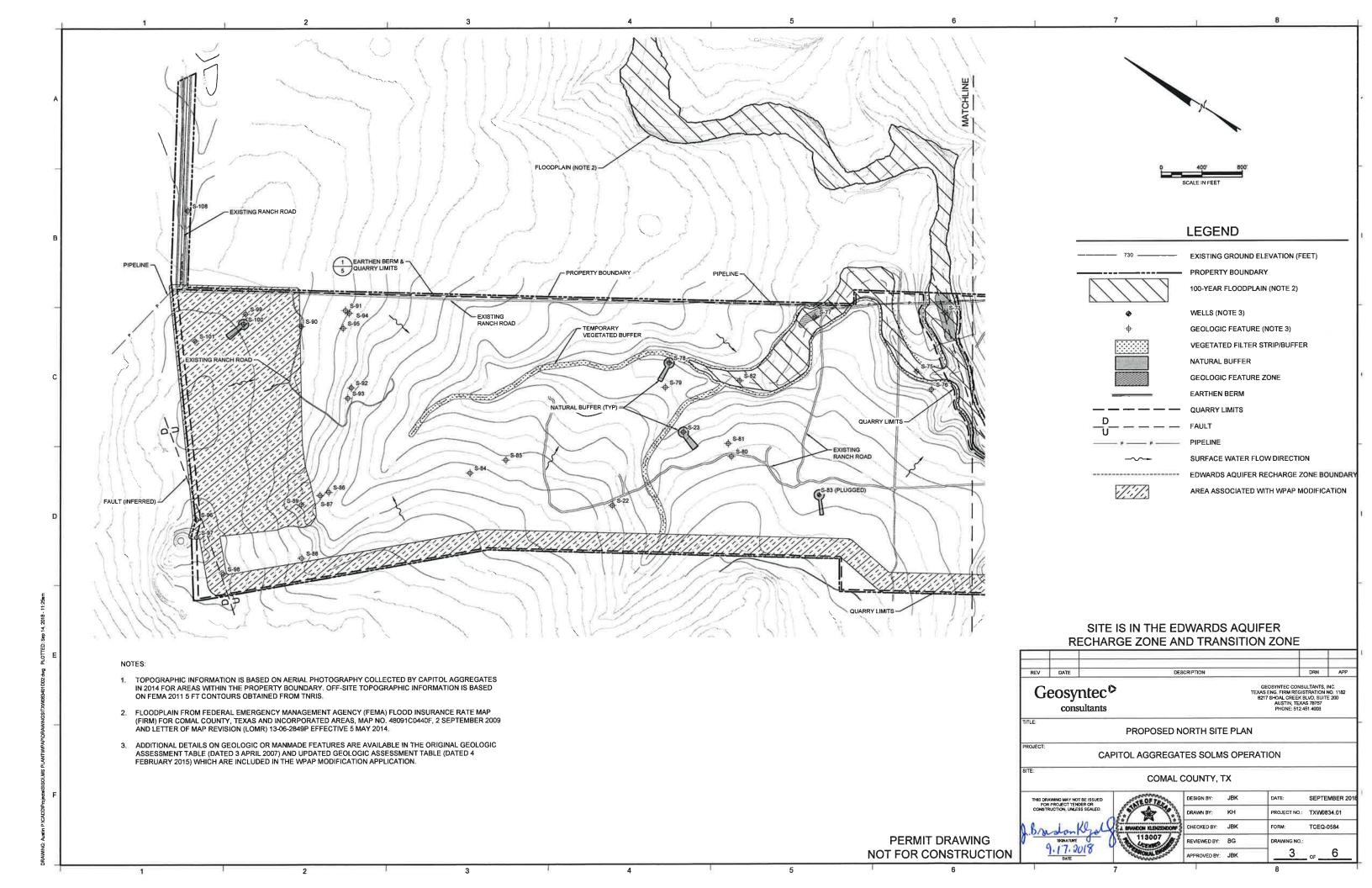
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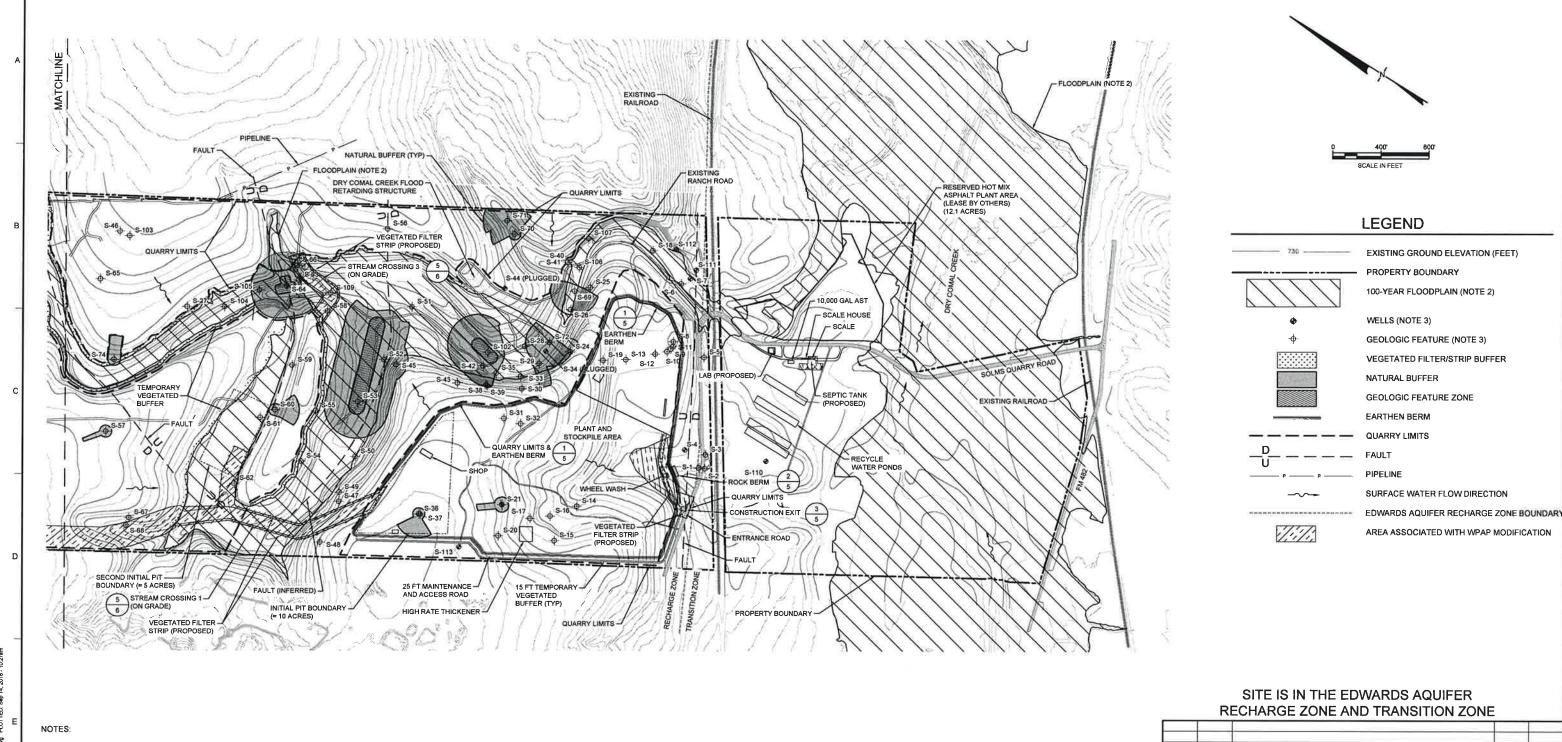
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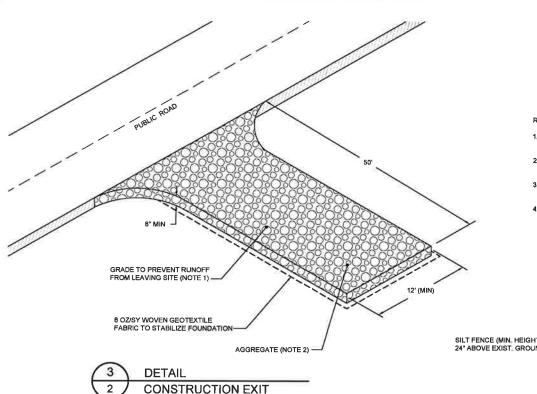
PERMIT DRAWING NOT FOR CONSTRUCTION





#### EARTHEN REPM NOTES

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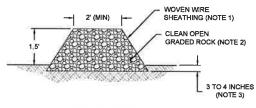


#### CONSTRUCTION ENTRANCE NOTES:

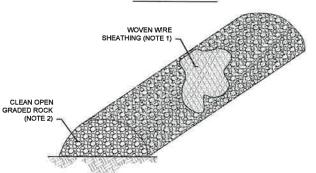
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- 2. AGGREGATE SHOULD CONSIST OF 4 TO 8 INCH WASHED STONE PLACED WITH A MINIMUM THICKNESS OF 8 INCHES.
- THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG, INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.
- 4. THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND.
- 5. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY QUARRY OPERATOR.

#### STOCKPILE NOTES:

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- 3. PERIMETER SEDIMENT CONTROLS SUCH AS SILT FENCING ALSO MUST BE INSTALLED AT STOCKPILE LOCATIONS TO PREVENT CONTACT WITH STORM WATER, INCLUDING RUN-ON.
- 4. STOCKPILES MUST BE LOCATED OUTSIDE OF ANY VEGETATED BUFFER AREAS AND SHOULD BE LOCATED AS FAR AS PRACTICABLE FROM STORM WATER CONVEYANCES AND IMPOUNDMENTS AND WATER BODIES.



#### CROSS-SECTION

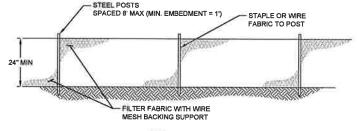




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- THE BERM SHALL BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.
- 4. MAINTENANCE REQUIREMENTS INCLUDE REMOVING SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES SIX INCHES AND DISPOSE OF THE ACCUMULATED SEDIMENT IN AN APPROVED MANNER THAT WILL NOT CAUSE ANY ADDITIONAL SEDIMENTATION. REPAIR ANY LOOSE WIRE SHEATHING, RESHAPE THE BERM AS NEEDED DURING INSPECTION. THE BERM SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SEDIMENT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC

# STEEL FENCE POST MAX, 8' SPACING, MIN. EMBEDMENT = 1' WIRE MESH BACKING SUPPORT 4 X 4 W1.4 X W1.4 MINIMUM ALLOWABLE, TYP COMPACTED EARTH BACKFILL FABRIC TOE-IN





#### GENERAL CONSTRUCTION NOTES:

- 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
- 3. IF ANY SENSITIVE FEATURE IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TOEQ 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 TOEQ 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 SHALL BE 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.
- 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).
- 5. 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.
- 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).
- 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 STABILATION 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 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 IN
- 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:
- 12.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;
- 12.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;
- 12.C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

SAN ANTONIO REGIONAL OFFICE 14250 JUDSON ROAD SAN ANTONIO, TEXAS 78233-4480 PHONE: (210) 490-3096 FAX: (210) 545-4329

#### SILT FENCE NOTES:

- THE MAXIMUM DRAINAGE AREA TO THE SILT FENCE SHALL NOT EXCECT THE MANUFACTURER'S RECOMMENDATION, BUT IN NO CASE SHALL THE DRAINAGE AREA BE GREATER THAN 0.5 ACRE PER 100 FT. SILT FENCE MAY NOT BE USED IN AREAS OF CONCENTRATED FLOW (FOR EXAMPLE, DITCHES AND CHANNELS).
- SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN OR NONWOVEN FABRIC. THE FABRIC WIDTH SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZYYD, MULLEN BURST STRENGTH EXCEEDING 190 LB/NY, ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NO. 30.
- FENCE POSTS SHOULD 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<sup>2</sup>, AND BRINDELL HARDNESS EXCEEDING 140.
- WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.
- 5. THE TOE OF THE SILT FENCE SHOULD 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. 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.
- SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHOULD BE A 3-FOOT OVERLAP, SECURELY FASTED WHERE ENDS OF FABRIC MEET.
- REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES: REPLACE ANY TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION. REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.

PERMIT DRAWING NOT FOR CONSTRUCTION

# SITE IS IN THE EDWARDS AQUIFER RECHARGE ZONE AND TRANSITION ZONE

GEOSYNTEC CONSULTANTS INC

CONSULTANTS

CONS

CAPITOL AGGREGATES SOLMS OPERATION

COMAL COUNTY, TX



3

- E

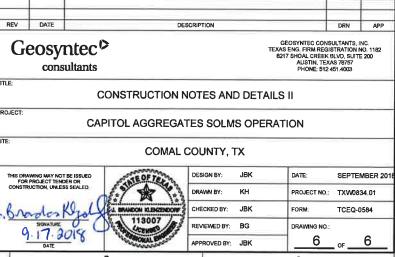
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# SECTION VEGETATED FILTER STRIP FOR STREAM CROSSINGS

#### VEGETATED FILTER STRIP NOTES:

- 1, THE FILTER STRIP SHOULD EXTEND ALONG THE ENTIRE LENGTH OF THE CONTRIBUTING AREA, THE CONTRIBUTING AREA DRAINING TO THE VEGETATED FILTER STRIP WILL BE LIMITED TO NO MORE THAN 72 FEET.
- 2. THE FILTER STRIP SLOPE SHOULD NOT EXCEED 10%

#### SITE IS IN THE EDWARDS AQUIFER **RECHARGE ZONE AND TRANSITION ZONE**



**PERMIT DRAWING** NOT FOR CONSTRUCTION

# **Temporary Stormwater Section**

**Texas Commission on Environmental Quality** 

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

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

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

# Signature

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

Print Name of Customer/Agent: J. Brandon Klenzendorf, P.E.

Date: 9.17.2018

Signature of Customer/Agent:

Regulated Entity Name: Capitol Aggregates Solms Operation

# **Project Information**

p. Brandon Klyerda

## **Potential Sources of Contamination**

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

1.	Fuels for construction equipment and hazardous substances which will be used during construction:
	The following fuels and/or hazardous substances will be stored on the site: <u>Diesel fuel</u>
	These fuels and/or hazardous substances will be stored in:
	Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

	<ul> <li>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.</li> <li>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.</li> </ul>
	Fuels and hazardous substances will not be stored on the site.
2.	Attachment A - Spill Response Actions. A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.
3.	Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
4.	Attachment B - Potential Sources of Contamination. A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.
S	equence of Construction
5.	Attachment C - Sequence of Major Activities. A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.
	<ul> <li>For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.</li> <li>For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.</li> </ul>
6.	Name the receiving water(s) at or near the site which will be disturbed or which will

# Temporary Best Management Practices (TBMPs)

receive discharges from disturbed areas of the project: Dry Comal Creek

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

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

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

There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.
11. Attachment H - Temporary Sediment Pond(s) Plans and Calculations. Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.
⊠ N/A
12. Attachment I - Inspection and Maintenance for BMPs. A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.
13. All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.
14. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).
Soil Stabilization Practices
Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.
17. Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices. A

schedule of the interim and permanent soil stabilization practices for the site is

attached.

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

#### Administrative Information

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

#### Temporary Stormwater Section Form (TCEQ-0602) Supplemental Information

The information presented in the attachments to form TCEQ-0602 apply specifically to the area associated with this WPAP modification. Temporary stormwater control measures identified in the currently approved WPAP which are located outside the area associated with this WPAP modification request are still applicable and will not be modified. For the area associated with this WPAP modification request, plans, procedures, measures, and controls described in the currently approved WPAP will remain the same, unless otherwise indicated. An AST with a storage capacity of 10,000-gallons is stored on the site outside of the area associated with this WPAP modification request. An AST Facility Plan application was previously submitted and approved on 30 November 2017.

#### **Attachment A – Spill Response Actions**

The previously approved Spill Response Actions are not proposed to be modified as a result of this WPAP modification request.

#### Attachment B - Potential Sources of Contamination

Potential sources of contamination at the project site include soil, fueling and lubricants from vehicles and equipment, material loading areas, trash and debris, spills or leaks, and other waste materials generated on-site.

#### <u>Attachment C – Sequence of Major Activities</u>

Clearing has begun in the initial plant area as shown on the attached Previously Approved Site Plan. Topsoil has been cleared to create an earthen berm that surrounds the initial plant and stockpile areas. Excavation of the initial quarry pit has begun. A rock crushing plant has been installed and crushing and screening operations started in order to make product for use on-site and shipment off-site. Quarrying of the main pit is being conducted in stages of areas less than 10 acres cleared at a time; the quarry activities will progress until ultimately encompassing the areas labeled "Quarry Limits" on the attached Site Plans. The cleared topsoil will be used to construct ever-expanding berms surrounding the cleared area.

In accordance with the previously approved WPAP, a shop area will be constructed north of the entrance road and will be controlled by a downgradient earthen/rock berm. A temporary silt fence will be used downgradient of the earthen/rock berm until the earthen berm has been

stabilized with vegetation. Undisturbed natural vegetated buffers downgradient of the earthen/rock berm will serve as final treatment for this area. A wheel wash will be located near the entrance. A pre-check truck scale will then be installed along the road in the pit. Earthen berms, rock berms, and silt fencing will temporarily control stormwater in this area during construction. Ultimately, the quarry pit will control runoff from this area.

As clearing continues, an access road will be constructed at Stream Crossing 1 to continue quarry operations north of the tributary to Dry Comal Creek. According to the previously approved WPAP, Stream Crossing 1 will be constructed on-grade through the Dry Comal Creek inundation area. Stream Crossing 1 is proposed to be constructed of gravel. Stream Crossing 2 is proposed to be removed as part of this WPAP modification request. Stream Crossing 3 will connect the quarry pit on the west side of Dry Comal Creek to the quarry pit on the east side of Dry Comal Creek. Stream Crossing 3 is an existing on-grade crossing established during the installation of the pipeline that runs under the site. Stream Crossing 3 will be widened and is proposed to be constructed of gravel. Outside of the quarry pit, TSS from Stream Crossings 1 and 3 will be treated with proposed engineered vegetated filter strips as part of this WPAP modification request.

In accordance with the previously approved WPAP modification, aggregate production has increased, and Capitol Aggregates currently washes material and uses unlined recycled water ponds constructed on the Edwards Aquifer Transition Zone.

#### **Attachment D – Temporary Best Management Practices and Measures**

BMPs to Prevent Pollution that Originates Upgradient from the Site

The previously approved BMPs to prevent pollution that originates upgradient from the Site are not proposed to be modified as a result of this WPAP modification request. These include earthen berms surrounding the plant and pit areas as shown on the Site Plans. As the size of the quarry expands, the earthen berms will expand throughout the life of the project to the "Quarry Limits" shown on the Site Plans.

BMPs to Prevent Pollution that Originates On-Site or Flows Off-Site

According to the previously approved WPAP, pollution of surface water, groundwater, or stormwater that originates on-site or flows off-site will be retained in the quarry or treated with proposed vegetated filter strips. As the size of the quarry expands, the earthen berms will expand throughout the life of the project to the "Quarry Limits", as shown on the Site Plans. It is not

expected that groundwater will be encountered in the quarry excavation anywhere on-site. The approved wet basin is proposed to be removed as a result of this WPAP modification request.

Additional temporary BMPs, such as natural vegetated buffers and stabilization, will be used to treat runoff that originates on-site and flows off-site.

BMPs to Prevent Pollution from Entering Surface Streams, Sensitive Features, or the Aquifer

According to the previously approved WPAP, the prevention of pollutants from entering surface streams, sensitive features or the aquifer will be mitigated by silt fences, earthen berms and rock berms, vegetated buffers, vegetative filter strips, and the construction entrance which will be constructed as shown on the attached Site Plans. The previously approved BMPs to prevent pollution from entering surface streams, sensitive features, or the aquifer are not proposed to be modified as a result of this WPAP modification request. These include setbacks a minimum of 25 feet from the 100-year floodplain and from any stream present without a mapped floodplain. Floodplain and stream setbacks within the quarry limits will be temporary until approval can be obtained to mine within the floodplain. These naturally vegetated setbacks will serve as a final treatment for stormwater runoff leaving the active portion of the site. Earthen berms surrounding the pit will expand with the pit up to these setback points until approval can be obtained to mine within the floodplain. Temporary vegetated buffers will also be established, as shown on the Site Plans, around sensitive features located within the proposed mining limits, until the features are sealed and removed through mining.

Stream Crossings 1 and 3 were previously approved to be constructed of steel-reinforced concrete and built on-grade but are proposed to be constructed with gravel as a result of this WPAP modification request. According to the previously approved WPAP, a raised crossing is not warranted in these areas due to local topography. Installing a raised crossing would pose a greater risk of flooding and TSS contamination during larger storm events. These new crossings will be stabilized with gravel to control dust and will be treated with proposed vegetated filter strips for water quality treatment. The access road approaching Stream Crossing 1 from the south will be approximately 600 feet long, with a 10% slope, and will be excavated into the limestone hillside. This WPAP modification proposes that runoff from Stream Crossing 1 be treated with an engineered vegetated filter strip prior to draining to the previously approved engineered swale. Stream Crossing 1 has been designed with a 2% cross-slope to drain runoff towards the proposed vegetated filter strip and previously approved swale to convey stormwater to the creek while reducing erosion. Stream Crossing 2 in the previously approved WPAP will no longer be required and is proposed to be removed. Due to the removal of the hot mix asphalt and concrete batch plant areas in the northern portion of the site, the previously approved haul road along the western site perimeter is no longer required, resulting in the proposed removal of

Stream Crossing 2. This WPAP modification also proposes Stream Crossing 3 to be treated with a proposed engineered vegetated filter strip.

BMPs to Maintain Flow to Sensitive Features

The previously approved BMPs to maintain flow to sensitive features are not proposed to be modified as a result of this WPAP modification request. According to the previously approved WPAP, 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.

Flow will be maintained to naturally occurring sensitive features, to the maximum extent possible, by using rock berms, silt fences, and natural vegetated areas upgradient of the sensitive features. According to the previously approved WPAP, a Professional Geoscientist will inspect the quarry quarterly for sensitive features.

#### Attachment E – Request to Temporarily Seal a Feature

The original WPAP approved the following sensitive features to be temporarily sealed and removed through mining:

- 1) S-21
- 2) S-23
- 3) S-36
- 4) S-70
- 5) S-71
- 6) S-78
- 7) S-100

The previously approved WPAP modification also approved the following sensitive features to be temporarily sealed and removed through mining:

- 1) S-57
- 2) S-60
- 3) S-83

This proposed WPAP modification request does not propose to modify the previously approved sensitive features to be temporarily sealed and removed through mining.

## **Attachment F – Structural Practices**

According to the previously approved WPAP, temporary BMPs proposed for the limestone quarry include rock berms, natural vegetated buffers, engineered vegetated filter strips, mulch, silt fencing, earthen berms, construction entrances, and use of a vacuum truck. The use of a vacuum truck is no longer required because Stream Crossings 1 and 3 are will be treated with proposed vegetated filter strips. The rock berms are used to limit runoff discharge of sediment. The earthen berms are used to retain runoff and limit runoff discharge of pollutants from exposed areas of the site as well as to divert runoff away from exposed (disturbed) soils. Natural vegetated buffers will be left in place in areas not disturbed and will treat runoff from upgradient disturbed areas. The quarry pit will also be utilized to retain runoff and reduce runoff discharge of pollutants from exposed areas of the site. The temporary and permanent 25 ft vegetated buffers surrounding the floodplain and creek tributaries will treat runoff approaching the creek from upgradient disturbed areas. Placement of structural practices in the floodplain has been avoided.

## Attachment G – Drainage Area Map

According to the previously approved WPAP, for areas that will have more than 10 acres within a common drainage area disturbed at one time, a temporary sediment pond is not required because runoff will be retained in the quarry pit. A Drainage Area Map has been prepared to show the drainage areas contributing to each proposed vegetated filter strip. This WPAP modification request will not alter the drainage patterns from the previously approved WPAP.

## <u>Attachment H – Temporary Sediment Pond(s) Plans and Calculations</u>

Not applicable. According to the previously approved WPAP, a temporary sediment pond is not required during construction.

## **Attachment I – Inspection and Maintenance for BMPs**

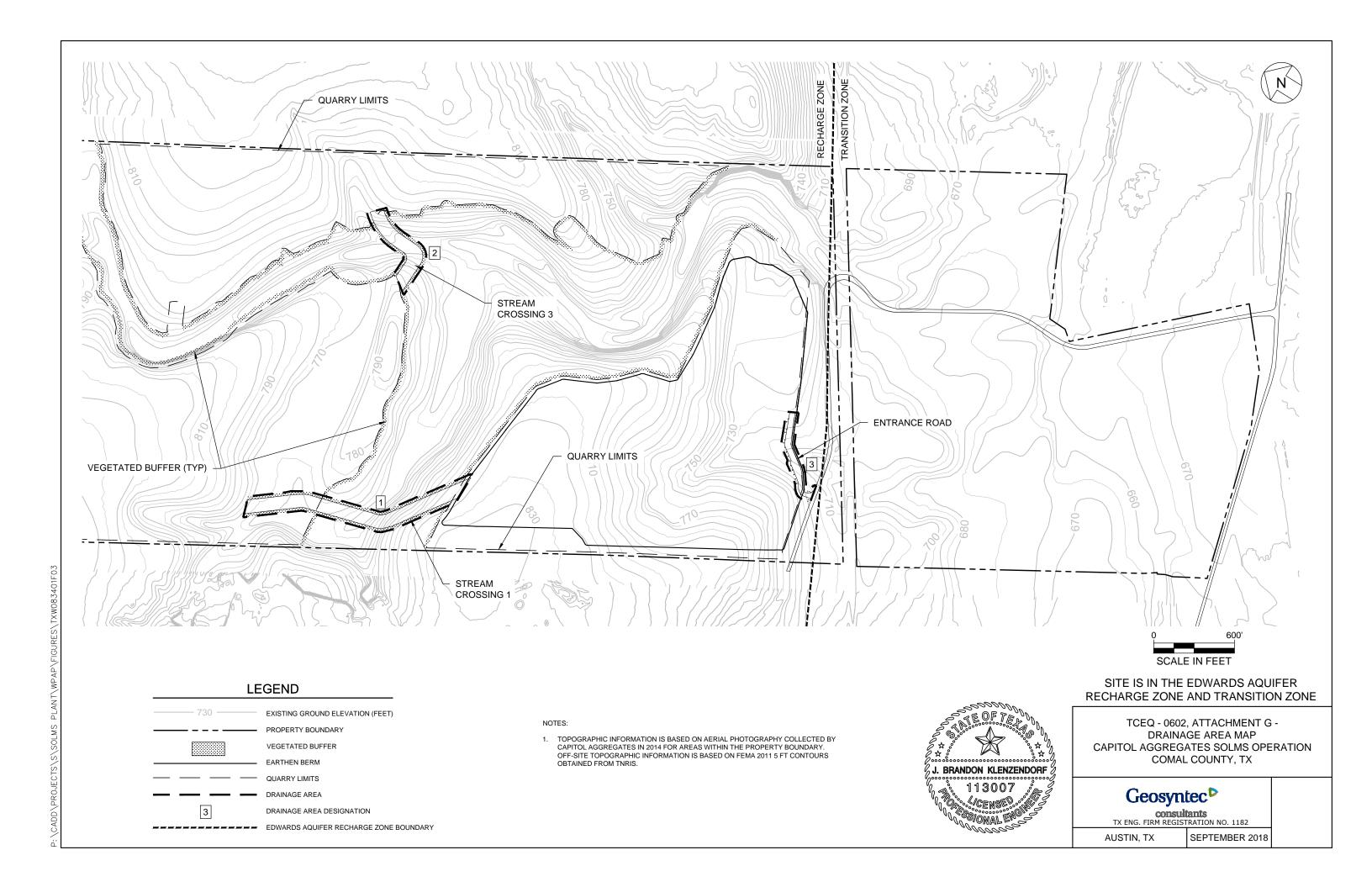
The previously approved inspection and maintenance requirements for BMPs are not proposed to be modified as a result of this WPAP modification request with the exception of the removal of a vacuum truck for cleaning of the proposed paved Stream Crossings 1 and 3, which will now be treated with vegetated filter strips.

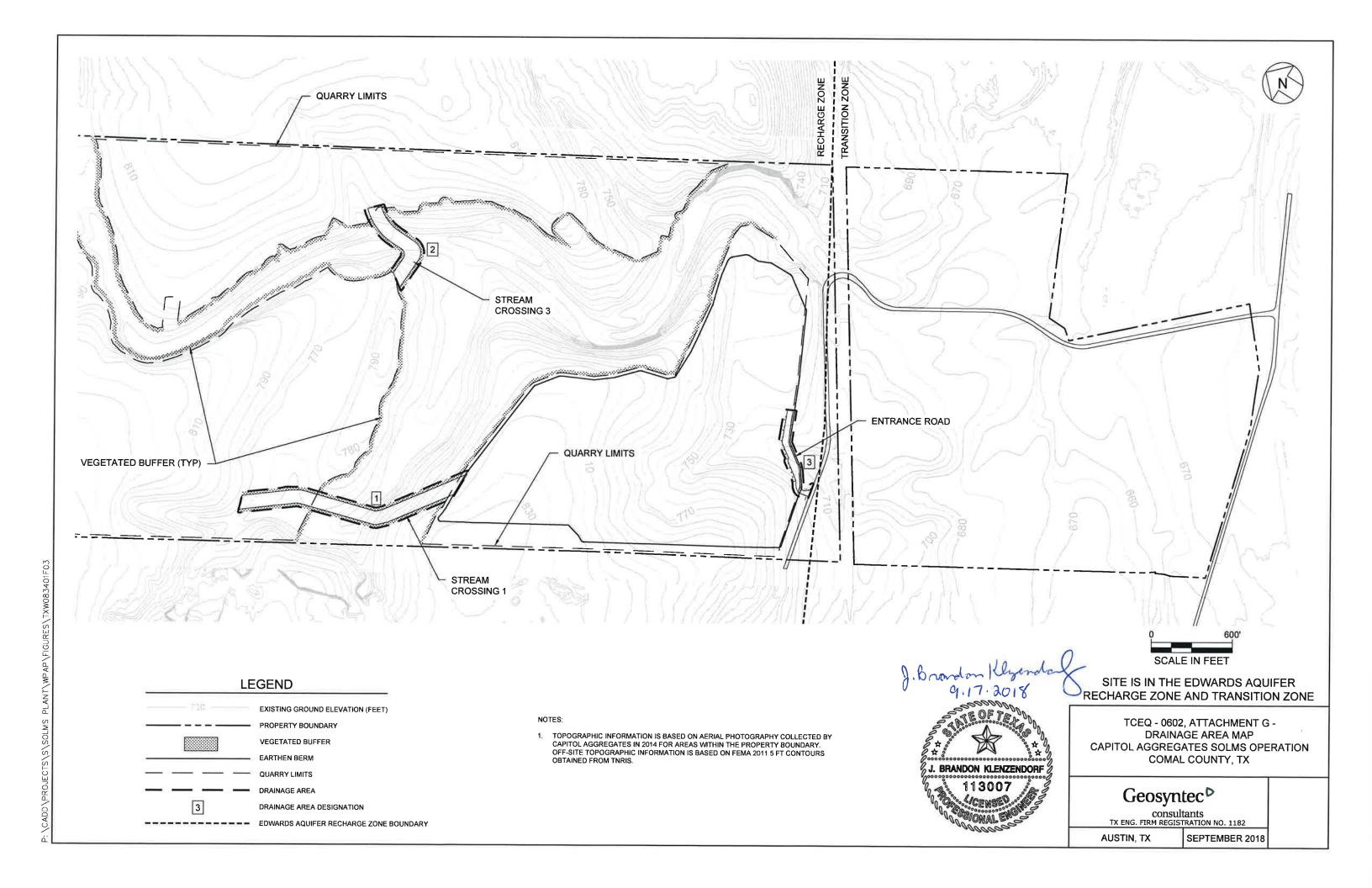
Capitol Aggregates WPAP Modification Capitol Aggregates Solms Operation TCEQ-0602, Temporary Stormwater Section

All BMPs must be maintained in effective operating condition. If sediment escapes the Site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts to water quality and prior to the next rain event, if feasible. 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 routinely). Erosion from storms or other damage should be repaired as soon as practical by regrading the area and applying new seed. Any sediment deposited on the roadway shall be swept as necessary and within the same day as discovery.

## Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

The previously approved schedule of interim and permanent soil stabilization practices are not proposed to be modified as a result of this WPAP modification request.





## **Permanent Stormwater Section**

**Texas Commission on Environmental Quality** 

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

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

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

## Signature

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

executive director approval. The application was prepared by:

Print Name of Customer/Agent: J. Brandon Klenzendorf, P.E.

Date: 9.17.2018

Signature of Customer/Agent

J. BRANDON KLENZENDOR

Regulated Entity Name: Capitol Aggregates Solms Operation

## Permanent Best Management Practices (BMPs)

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

1. Permanent BMPs and measures must be implemented to control the discharge of

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

	A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is:
	□ N/A
3.	Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.
	□ N/A
4.	Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.
	<ul> <li>□ The site will be used for low density single-family residential development and has 20% or less impervious cover.</li> <li>□ The site will be used for low density single-family residential development but has more than 20% impervious cover.</li> <li>□ The site will not be used for low density single-family residential development.</li> </ul>
5.	The executive director may waive the requirement for other permanent BMPs for multifamily 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.
	<ul> <li>Attachment A - 20% or Less Impervious Cover Waiver. The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.</li> <li>The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.</li> </ul>
	The site will not be used for multi-family residential developments, schools, or small business sites.
6.	Attachment B - BMPs for Upgradient Stormwater.

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

11. Attachment G - Inspection, Maintenance, Repair and Retrofit Plan. A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:
Prepared and certified by the engineer designing the permanent BMPs and measures
Signed by the owner or responsible party  Procedures for documenting inspections, maintenance, repairs, and, if necessary retrofit
A discussion of record keeping procedures
∐ N/A
12. Attachment H - Pilot-Scale Field Testing Plan. Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.
⊠ N/A
13. Attachment I -Measures for Minimizing Surface Stream Contamination. A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.
□ N/A
Responsibility for Maintenance of Permanent BMP(s)
Responsibility for maintenance of best management practices and measures after construction is complete.
14. The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.
□ N/A
15. A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.
□ N/A

## Permanent Stormwater Section Form (TCEQ-0600) Supplemental Information

The information presented in the attachments to form TCEQ-0600 applies specifically to the area associated with this WPAP modification request. Permanent stormwater control measures identified in the previously approved WPAP which are located outside the area associated with this WPAP modification request are still applicable and will not be modified. For the area associated with this WPAP modification request, plans, procedures, measures, and controls described in the previously approved WPAP will remain generally the same and are repeated here with slight organizational and clarification modifications for convenience.

## Attachment A – 20% or Less Impervious Cover Waiver

Not applicable. The site will have an impervious cover of less than 20%. A waiver is only available to multi-family residential developments, schools, or small business sites. Therefore, this site is not exempt from the requirement to have permanent BMPs. Several permanent BMPs will be implemented and maintained in order to control and treat stormwater runoff.

## Attachment B – BMPs for Upgradient Stormwater

According to the previously approved WPAP, the final earthen berm surrounding the quarry and plant area will prevent upgradient runoff from contacting the disturbed soils in the plant area. As the size of the quarry expands during its operational lifetime, the earthen berms will be extended to the "Quarry Limits" shown on the attached Site Plans.

Permanent stormwater controls are those that are to remain in place after construction has been completed. At the time construction is completed at the subject site, on-site stormwater will be retained inside the quarry pits. Upgradient stormwater will be directed around the site by the approved earthen berm located at the "Quarry Limits".

## **Attachment C – BMPs for On-Site Stormwater**

According to the previously approved WPAP, it is not expected that any significant amount of groundwater will be encountered in the quarry excavation in disturbed areas of the site.

The earthen berm surrounding the quarry and plant area will prevent on-site stormwater from discharging from disturbed areas and will retain any runoff from the plant area in the quarry pit.

As the size of the quarry expands during its operational lifetime, the earthen berms will be extended to the "Quarry Limits", as shown on the Site Plans.

Permanent stormwater controls are those that are to remain in place after construction has been completed. At the time construction is completed at the subject site, on-site stormwater will be retained inside the quarry pits. The previously approved wet basin is proposed to be removed as part of this WPAP modification request due to the removal of impervious cover and additional engineered vegetated filter strips which are proposed to treat on-site stormwater flows.

## Attachment D – BMPs for Surface Streams

According to the previously approved WPAP, a description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer consist of the following:

The earthen berm surrounding the quarry and plant area will prevent upgradient runoff from contacting the disturbed soils in the plant area and will retain any runoff from the plant area in the quarry pit.

The quarry pits will capture the vast majority of stormwater that originates on-site. Any disturbed areas on-site at the end of quarrying that have not been quarried will be re-vegetated to stabilize soils and reduce sediment in runoff.

Vegetation will be used to permanently stabilize sediment and reduce erosion from disturbed areas that do not drain into the quarry pit. Permanent vegetative cover is an effective method for stabilizing soils by protecting bare soils from raindrop impact and by reducing the velocity and volume of overland flow.

In addition, setbacks will be established a minimum of 25 feet from the 100-year floodplain and from any stream present without a mapped floodplain. Floodplain and stream setbacks located outside of the proposed mining limits will be maintained during the entire operational lifetime of the quarry. Natural vegetation will remain undisturbed as shown on the attached Site Plans. These natural vegetated buffers will serve as a final treatment for stormwater runoff leaving the active portion of the site.

The previously approved wet basin is proposed to be removed as part of this WPAP modification request due to the removal of impervious cover on the northern portion of the site and addition of engineered vegetated filter strips which are proposed to treat on-site stormwater flows that would have been treated by the wet basin. The proposed vegetated filter strips will be used to prevent pollutants from entering surface streams at Stream Crossings 1 and 3 and treat paved areas of the

entrance road as shown on the Site Plans and described in the WPAP Permanent Stormwater Section Attachment F below.

## <u>Attachment E – Request to Seal a Features</u>

Not applicable. The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed. Therefore, a Request to Seal Features is not required.

## **Attachment F – Construction Plans**

The Construction Plans (Plans) for the project area associated with the WPAP modification are the Site Plans submitted with the WPAP Application (form TCEQ-0584) as part of this WPAP modification request. All geologic features, structural BMPs, and TCEQ construction notes are shown on the Site Plans. Design calculations for the permanent BMPs associated with this WPAP modification are provided below. In addition, the TCEQ TSS Removal Calculations spreadsheet is provided at the end of these attachments for the vegetated filter strips.

Stream Crossings and Vegetated Filter Strip Designs

To facilitate access to the quarry pits farther to the north and eastern portions of the property, Stream Crossings 1 and 3 will be required in the approximate locations shown on the Site Plans. Prior to constructing the stream crossings, any required floodplain permits will be obtained, and the stream crossing designs will be in accordance with those permits. Natural vegetated filter strips will be maintained adjacent to the floodplain.

According to the previously approved WPAP, Stream Crossing 1 will be constructed on-grade. The contributing drainage area for the vegetated filter strip at Stream Crossing 1 is shown on the Drainage Area Map in Attachment C of form TCEQ-0602 as Drainage Area 1 with an area of 7.75 acres. Stream Crossing 1 will be stabilized with gravel which has a crown and cross-slope towards the adjacent vegetated filter strips for water quality treatment. The access road approaching Stream Crossing 1 from the south will be approximately 600 feet long, with a 10% slope, and will be excavated into the limestone hillside. This WPAP modification request proposes to treat runoff from Stream Crossing 1 with an engineered vegetated filter strip. Stream Crossing 1 has been designed with a 2% cross-slope to drain runoff towards the proposed vegetated filter strip.

According to the previously approved WPAP, Stream Crossing 2 was designed as a paved bridge with four 18-inch culverts to convey flow from the 2-year storm without overtopping the road.

TXW0834/6.1 f-0600 Attachments 180914.docx

Due to the removal of the hot mix plant and concrete batch plant areas in the northern portion of the property as part of this WPAP modification request, the previously proposed haul road and associated vegetated buffers along the western site perimeter will no longer be required. Eliminating the planned haul road will also eliminate the need for Stream Crossing 2 in the approved WPAP.

According to the previously approved WPAP, Stream Crossing 3 is an existing on-grade crossing established during the installation of the pipeline that runs under the site. Stream Crossing 3 will be widened and is proposed to be constructed of gravel. This WPAP modification request proposes to treat runoff from Stream Crossing 3 with an engineered vegetated filter strip.

Engineered vegetated filter strips will be used to treat stormwater runoff from the roads leading up to and away from Stream Crossings 1 and 3 outside of the quarry pit. Vegetated filter strips will be maintained downgradient from the impervious cover in order to achieve the required 80% TSS removal. The contributing area draining to the vegetated filter strips will be limited to no more than 72 ft using the 2% cross-slope of the roads. The vegetated filter strips have a slope that will not exceed 20%, a minimum dimension (in the direction of flow) no less than 15 feet, a minimum vegetated cover of 80%, and will be free of gullies or rills. Sheet 4 of the Site Plans summarizes the total drainage area (including the vegetated filter strip area), the impervious area draining to the vegetated filter strip, and the required and achieved TSS removal. The TCEQ TSS Removal Calculations spreadsheet is provided at the end of these attachments for the vegetated filter strips.

## Attachment G – Inspection, Maintenance, Repair and Retrofit Plan

### Permanent Earthen Berms

According to the previously approved WPAP, final earthen berms should be inspected monthly until stabilized with vegetation. Written documentation of these inspections should be kept during the course of construction at the project site. Any erosion of berms should be backfilled and compacted as soon as possible.

## Engineered and Natural Vegetated Filter Strips

According to the previously approved WPAP, engineered and natural vegetated filter strips should be inspected at least twice annually for erosion or damage to vegetation, until the quarrying activities are complete. Written documentation of these inspections should be kept at the Site during the course of construction. Bare spots and areas of erosion identified during inspections must be replanted and restored to meet specifications.

Engineered vegetated filter strips should be mowed at least twice annually. Regular mowing should also include weed control practices; however, herbicide use should be kept to a minimum. Trash and debris items should be removed.

In addition, the following inspection, maintenance, repair and retrofit requirements are proposed for the vegetated filter strips as part of this WPAP modification request:

- Pest Management: An Integrated Pest Management (IPM) Plan should be developed for vegetated areas. This Plan should specify how problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.
- Seasonal Mowing and Lawn Care: Vegetated filter strips shall be mowed a minimum of twice annually. Grass clippings and brush debris should not be deposited on vegetated filter strip areas. Regular mowing should also include weed control practices; however, herbicide use should be kept to a minimum. Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients. Irrigation of the site can help assure a dense and healthy vegetative cover.
- Inspection: Inspect filter strips for erosion or damage to vegetation. Additional inspections after periods of heavy runoff is most desirable. The filter strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems are developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during inspections must be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.
- Debris and Litter Removal: Trash tends to accumulate in vegetated areas, particularly along roads. Any filter strip structures (i.e., level spreaders) should be kept free of obstructions to reduce floatables being flushed downstream and for aesthetic reasons. The need for this practice is determined through periodic inspection but should be performed no less than 4 times per year.
- Sediment Removal: Sediment removal is not normally required in filter strips since the vegetation normally grows through it and binds it to the soil. However, sediment may accumulate along the upstream boundary of the strip preventing uniform overland flow. Excess sediment should be removed by hand or with flat-bottomed shovels.
- Grass Reseeding and Mulching: A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment. If possible, flow should be diverted from the damaged areas until the grass is firmly established. Bare spots and areas of erosion identified during inspections must be replanted and restored to meet specifications. Corrective maintenance, such as weeding or replanting should be

Capitol Aggregates WPAP Modification Capitol Aggregates Solms Operation TCEQ-0600, Permanent Stormwater Section

done more frequently in the first two to three years after installation to ensure stabilization. Dense vegetation may require irrigation immediately after planting and during particularly dry periods, particularly as vegetation is initially established.

## Inspection, Maintenance, Repair, and Retrofit Plan Signature Page

I, <u>Paul Detterline</u>, have read and understand the Inspection, Maintenance, Repair, and Retrofit (IMRR) Plan contained in this Water Pollution Abatement Plan (WPAP) modification.

I understand the specific Permanent Best Management Practices (PBMPs) and associated inspection and maintenance schedule which are outlined in this IMRR Plan. Capitol Aggregates, Inc. will implement these inspections and perform maintenance as required to meet the intent of the IMRR Plan.

## Name and Signature of Responsible Party for Maintenance of Permanent BMPs

Printed Name: Paul Detterline
Title: Director Environmental Affairs
Signature: Val Little
Date: 9/25/18
Name and Signature of Engineer
Printed Name: _J. Brandon Klenzendorf, P.E
Title: Project Engineer
Signature: J. broden Hydl
Date: 9 25 2018

## Attachment H - Pilot-Scale Field Testing Plan

Not applicable. BMPs that are not recognized by the TCEQ Executive Director are not proposed for the project. Therefore, a Pilot-Scale Field Testing Plan is not required.

## **Attachment I – Measures for Minimizing Surface Stream Contamination**

According to the previously approved WPAP, to avoid surface stream contamination, flows from areas outside of the quarry pits will be minimized by preserving vegetated/undisturbed areas and by retaining runoff with earthen berms. These BMPs will mitigate increases in stream flows due to the regulated activity (impervious cover associated with the site). The quarry pits will retain stormwater and any associated contaminants without discharge to surface water or stream channels. Because little runoff is expected from the site due to the proposed quarry pits and permanent BMPs, stream flashing, stronger flows, and in-stream velocities are not expected to occur as a result of this project.

The previously approved wet basin is proposed to be removed as part of this WPAP modification request due to the removal of impervious cover.

Capitol Aggregates WPAP Modification Capitol Aggregates Solms Operation TCEQ-0600, Permanent Stormwater Section

## **Appendix to TCEQ-0600**

## **TSS Removal Calculations**

This Appendix provides the TSS removal calculations for the proposed permanent vegetated filter strips associated with impervious cover for Stream Crossing 1, Stream Crossing 3, and the Entrance Road over the Edwards Aquifer Recharge Zone. All other impervious cover will be retained in the quarry pit or is located over the Edwards Aquifer Transition Zone and does not drain onto the Recharge Zone.

## Texas Commission on Environmental Quality

#### TSS Removal Calculations 04-20-2009

Project Name: Capitol Aggregates Solms Operation - WPAP Mod

Date Prepared: 3/5/2018

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:

 $L_{\text{M TOTAL PROJECT}}$  = 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 \* = 1015.00 acres
Predevelopment impervious area within the limits of the plan \* = 0.00 acres

Total post-development impervious cover fraction \* = 0.08

Total post-development impervious cover fraction \* = 0.08
P = 33 inches

L<sub>M TOTAL PROJECT</sub> = **73783** lbs.

3

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

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

#### Drainage Basin/Outfall Area No. = Crossing 1

Total drainage basin/outfall area = 7.75 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 2.62 acres
Post-development impervious fraction within drainage basin/outfall area = 0.34

L<sub>M THIS BASIN</sub> = 2352 lbs.

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

#### 3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips
Removal efficiency = 85 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<sub>R</sub>) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7:  $L_R = (BMP \text{ efficiency}) \times P \times (A_1 \times 34.6 + A_2 \times 0.54)$ 

where: A<sub>C</sub> = 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<sub>R</sub> = TSS Load removed from this catchment area by the proposed BMP

 $\begin{array}{lll} A_C = & {\bf 7.75} & {\rm acres} \\ A_I = & {\bf 2.62} & {\rm acres} \\ A_P = & {\bf 5.13} & {\rm acres} \\ L_R = & {\bf 2620} & {\rm lbs} \end{array}$ 

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

Desired  $L_{M THIS BASIN} = 2352$  lbs.

F = **0.90** 

### 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 = 1.70 inches

Post Development Runoff Coefficient = 0.28

On-site Water Quality Volume = 13254 cubic feet

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

Off-site area draining to BMP = 0.00 acres
Off-site Impervious cover draining to BMP = 0.00 acres

Impervious fraction of off-site area = 0
Off-site Runoff Coefficient = 0.00

Off-site Water Quality Volume = 0 cubic feet

Storage for Sediment = 2651

Total Capture Volume (required water quality volume(s) x 1.20) = 15904 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 = NA cubic feet

Minimum filter basin area = NA square feet

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

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins = NA cubic feet

Minimum filter basin area = NA square feet

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

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

10. Bioretention System Designed as Required in RG-348 Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin = NA cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool = NA cubic feet Permanent Pool Capacity is 1.20 times the WQV

Required capacity at WQV Elevation = NA cubic feet Cubic feet Cubic feet Capacity should be the Permanent Pool Capacity

plus a second WQV.

12. Constructed Wetlands Designed as Required in RG-348 Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands = NA cubic feet

13. AquaLogic<sup>™</sup> Cartridge System Designed as Required in RG-348 Pages 3-74 to 3-78

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

Required Sedimentation chamber capacity = NA cubic feet
Filter canisters (FCs) to treat WQV = NA cartridges

Filter basin area ( $RIA_F$ ) = **NA** square feet

14. Stormwater Management StormFilter® by CONTECH

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

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

15. Grassy Swales Designed as Required in RG-348 Pages 3-51 to 3-54

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A = 0.00 acres
Impervious Cover in Drainage Area = 0.00 acres

Rainfall intensity = i = 1.1 in/hr
Swale Slope = 0 ft/ft

Side Slope (z) = 0Design Water Depth = y = 0.00 ft Weighted Runoff Coefficient = C = #DIV/0!

$$A_{CS}$$
 = cross-sectional area of flow in Swale = #DIV/0! sf  $P_{W}$  = Wetted Perimeter = #DIV/0! feet  $R_{H}$  = hydraulic radius of flow cross-section =  $A_{CS}/P_{W}$  = #DIV/0! feet  $n$  = Manning's roughness coefficient = 0.2

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

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

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

To calculate the flow velocity in the swale:

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

To calculate the resulting swale length:

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

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

Design Q = CiA = #DIV/0! cfs

Manning's Equation Q = 0.00 cfs Error 1 = #DIV/0! Swale Width= 6.00 ft

Instructions are provided to the right (green comments).

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

Instructions are provided to the right (blue comments).

To solve for bottom v Excel can simultaneo The required "Swale"

First, highlight Cell Fi Then click on "Tools' The value in the "Set The value in the "By Click on solve.

The resulting "Swale If the resulting "Swal

If there is not the opti Click on "Tools" and Then proceed as inst

Design Width =	6 ft		
Design Discharge =	0.00 cfs	Error 2 =	#DIV/0!
Design Depth =	0.33 ft		
Flow Velocity =	0.00 cfs		
Minimum Length =	0.00 ft		

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

#### 16. Vegetated Filter Strips

Designed as Required in RG-348

Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.

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

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

17. Wet Vaults Designed as Required in RG-348 Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 = NA lbs

First calculate the load removal at 1.1 in/hour

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

C = runoff coefficient for the drainage area = 0.20 C = Runoff Coefficient =  $0.546 (IC)^2 + 0.328 (IC) + 0.03$ i = design rainfall intensity = 0.11 = 0.11 in/hour

A = drainage area in acres = 1 acres

Q = flow rate in cubic feet per second = 0.22 cubic feet/sec

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

Q = Runoff rate calculated above = 0.22 cubic feet/sec
A = Water surface area in the wet vault = 150 square feet

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

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

Load removed by Wet Vault = #VALUE! Ibs

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

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

If you would like to in Excel can simultaneo The required "Design

First set the desired I Highlight Cell F232.

Click on "Tools" and The value in the "Set The value in the "By ( Click on solve.

The resulting "Design If the resulting "Design

Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 = 0.75 percent

Efficiency Reduction for Actual Rainfall Intensity = 0.83 percent

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

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

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

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

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E2 be changed from 0.5 to 0.65 on May 3, 2006

 $E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100 = 86.38 \text{ percent}$  NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES =  $E_1$  = 75.00 percent

EFFICIENCY OF THE SECOND BMP IN THE SERIES =  $E_2$  = 70.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES =  $E_3$  = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:  $(A_1 \text{ AND } A_P \text{ VALUES ARE FROM SECTION 3 ABOVE})$ 

 $L_R = E_{TOT} X P X (A_I X 34.6 X A_P X 0.54) =$  2662.88 lbs

20. Stormceptor

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

**BMP Sizing** 

Effective Area = NA EA

Calculated Model Size(s) = #N/A

Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =

Model Size or if you are choosing a larger model size) = 0 Model Size

BMP Efficiency % = #VALUE! %  $L_R Value = \#VALUE!$  lbs

TSS Load Credit = #VALUE! Ibs

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

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

### 21. Vortech

Required TSS Removal in BMP Drainage Area= NA lbs

Impervious Cover Overtreatment= 0.0000 ac TSS Removal for Uncaptured Area = 0.00 lbs

**BMP Sizing** 

Effective Area = NA EA

Calculated Model Size(s) = #N/A

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

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

Overflow Rate = #VALUE! Vor

Rounded Overflow Rate = #VALUE! V<sub>or</sub>

BMP Efficiency % = #VALUE! %

L<sub>R</sub> Value = #VALUE! Ibs

TSS Load Credit = #VALUE! Ibs

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

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

## Texas Commission on Environmental Quality

#### TSS Removal Calculations 04-20-2009

Project Name: Capitol Aggregates Solms Operation - WPAP Mod

Date Prepared: 3/27/2018

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<sub>M TOTAL PROJECT</sub> = 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 \* = 1015.00 acres
Predevelopment impervious area within the limits of the plan \* = 0.00 acres

Total post-development impervious cover fraction \* = 0.08

Total post-development impervious cover fraction \* = 0.08
P = 33 inches

L<sub>M TOTAL PROJECT</sub> = **73783** lbs.

3

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

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

#### Drainage Basin/Outfall Area No. = Crossing 3

Total drainage basin/outfall area = 5.00 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 1.63 acres
Post-development impervious fraction within drainage basin/outfall area = 0.33

L<sub>M THIS BASIN</sub> = 1463 lbs.

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

#### 3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips Removal efficiency = percent

> Bioretention Contech StormFilter Constructed Wetland Extended Detention Grassy Swale Retention / Irrigation Sand Filter Stormceptor Vegetated Filter Strips

Aqualogic Cartridge Filter

Vortechs

Wet Basin Wet Vault

#### 4. Calculate Maximum TSS Load Removed (L<sub>R</sub>) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7:  $L_R = (BMP \text{ efficiency}) \times P \times (A_1 \times 34.6 + A_2 \times 0.54)$ 

where: A<sub>C</sub> = Total On-Site drainage area in the BMP catchment area

A<sub>I</sub> = Impervious area proposed in the BMP catchment area

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

L<sub>R</sub> = TSS Load removed from this catchment area by the proposed BMP

 $A_C =$ 5.00 acres  $A_{l} =$ 1.63 acres  $A_p =$ 3.37 acres  $L_R =$ 1633 lbs

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

Desired L<sub>M THIS BASIN</sub> = 1463 lbs.

> F = 0.90

### 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 = 1.70 inches

Post Development Runoff Coefficient = 0.27

> On-site Water Quality Volume = 8368 cubic feet

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

Off-site area draining to BMP = 0.00 acres
Off-site Impervious cover draining to BMP = 0.00 acres

Impervious fraction of off-site area = 0
Off-site Runoff Coefficient = 0.00

Off-site Runoff Coefficient = 0.00

Off-site Water Quality Volume = 0 cubic feet

Storage for Sediment = 1674

Total Capture Volume (required water quality volume(s) x 1.20) = 10042 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

<u>tem</u> Designed as Required in RG-348 Pages 3-46 to 3-51

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

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

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin = NA cubic feet

Minimum filter basin area = NA square feet

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

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins = NA cubic feet

Minimum filter basin area = NA square feet

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

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

10. Bioretention System Designed as Required in RG-348 Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin = NA cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool = NA cubic feet Permanent Pool Capacity is 1.20 times the WQV

Required capacity at WQV Elevation = NA cubic feet Cubic feet Cubic feet Capacity should be the Permanent Pool Capacity

plus a second WQV.

12. Constructed Wetlands Designed as Required in RG-348 Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands = NA cubic feet

13. AquaLogic<sup>™</sup> Cartridge System Designed as Required in RG-348 Pages 3-74 to 3-78

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

Required Sedimentation chamber capacity = NA cubic feet
Filter canisters (FCs) to treat WQV = NA cartridges

Filter basin area ( $RIA_F$ ) = **NA** square feet

14. Stormwater Management StormFilter® by CONTECH

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

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

15. Grassy Swales Designed as Required in RG-348 Pages 3-51 to 3-54

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A = 0.00 acres
Impervious Cover in Drainage Area = 0.00 acres

Rainfall intensity = i = 1.1 in/hr
Swale Slope = 0 ft/ft

Side Slope (z) = 0Design Water Depth = y = 0.00 ft Weighted Runoff Coefficient = C = #DIV/0!

$$A_{CS}$$
 = cross-sectional area of flow in Swale = #DIV/0! sf  $P_{W}$  = Wetted Perimeter = #DIV/0! feet  $R_{H}$  = hydraulic radius of flow cross-section =  $A_{CS}/P_{W}$  = #DIV/0! feet  $n$  = Manning's roughness coefficient = 0.2

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

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

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

To calculate the flow velocity in the swale:

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

To calculate the resulting swale length:

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

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

Design Q = CiA = #DIV/0! cfs

Manning's Equation Q = 0.00 cfs Error 1 = #DIV/0! Swale Width= 6.00 ft

Instructions are provided to the right (green comments).

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

Instructions are provided to the right (blue comments).

To solve for bottom v Excel can simultaneo The required "Swale"

First, highlight Cell Fi Then click on "Tools' The value in the "Set The value in the "By Click on solve.

The resulting "Swale If the resulting "Swal

If there is not the opti Click on "Tools" and Then proceed as inst

Design Width =	6 ft		
Design Discharge =	0.00 cfs	Error 2 =	#DIV/0!
Design Depth =	0.33 ft		
Flow Velocity =	0.00 cfs		
Minimum Length =	0.00 ft		

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

#### 16. Vegetated Filter Strips

Designed as Required in RG-348

Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.

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

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

17. Wet Vaults Designed as Required in RG-348 Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 = NA lbs

First calculate the load removal at 1.1 in/hour

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

C = runoff coefficient for the drainage area = 0.19 C = Runoff Coefficient =  $0.546 (IC)^2 + 0.328 (IC) + 0.03$ i = design rainfall intensity = 0.19 C = Runoff Coefficient =  $0.546 (IC)^2 + 0.328 (IC) + 0.03$ 

A = drainage area in acres = 1.1 in/nou

Q = flow rate in cubic feet per second = 0.21 cubic feet/sec

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

Q = Runoff rate calculated above = 0.21 cubic feet/sec
A = Water surface area in the wet vault = 150 square feet

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

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

Load removed by Wet Vault = #VALUE! Ibs

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

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

If you would like to in Excel can simultaneo The required "Design

First set the desired I Highlight Cell F232.

Click on "Tools" and The value in the "Set The value in the "By ( Click on solve.

The resulting "Design If the resulting "Design

Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 = 0.75 percent

Efficiency Reduction for Actual Rainfall Intensity = 0.83 percent

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

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

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

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

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E2 be changed from 0.5 to 0.65 on May 3, 2006

 $E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) X (1 - 0.25E_3))] X 100 = 86.38 \text{ percent}$  NET EFFICIENCY OF THE BMPs IN THE SERIES

EFFICIENCY OF FIRST BMP IN THE SERIES =  $E_1$  = 75.00 percent

EFFICIENCY OF THE SECOND BMP IN THE SERIES =  $E_2$  = 70.00 percent

EFFICIENCY OF THE THIRD BMP IN THE SERIES =  $E_3$  = 0.00 percent

THEREFORE, THE NET LOAD REMOVAL WOULD BE:  $(A_1 \text{ AND } A_P \text{ VALUES ARE FROM SECTION 3 ABOVE})$ 

 $L_R = E_{TOT} X P X (A_I X 34.6 X A_P X 0.54) = 1659.43 lbs$ 

20. Stormceptor

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

**BMP Sizing** 

Effective Area = NA EA

Calculated Model Size(s) = #N/A

Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =

Model Size or if you are choosing a larger model size) = 0 Model Size

BMP Efficiency % = #VALUE! %  $L_R Value = \#VALUE!$  | bs

TSS Load Credit = #VALUE! lbs

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

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

### 21. Vortech

Required TSS Removal in BMP Drainage Area= NA lbs

Impervious Cover Overtreatment= 0.0000 ac TSS Removal for Uncaptured Area = 0.00 lbs

**BMP Sizing** 

Effective Area = NA EA

Calculated Model Size(s) = #N/A

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

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

Overflow Rate = #VALUE! Vor

Rounded Overflow Rate = #VALUE! V<sub>or</sub>

BMP Efficiency % = #VALUE! %

L<sub>R</sub> Value = #VALUE! Ibs

TSS Load Credit = #VALUE! Ibs

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

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

## Texas Commission on Environmental Quality

#### TSS Removal Calculations 04-20-2009

Project Name: Capitol Aggregates Solms Operation - WPAP Mod

Date Prepared: 3/27/2018

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<sub>M TOTAL PROJECT</sub> = 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 \* = 1015.00 acres
Predevelopment impervious area within the limits of the plan \* = 0.00 acres

Total post-development impervious cover fraction \* = 0.08

Total post-development impervious cover fraction \* = 0.08
P = 33 inches

L<sub>M TOTAL PROJECT</sub> = **73783** lbs.

3

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

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

#### Drainage Basin/Outfall Area No. = Entrance Road

Total drainage basin/outfall area = 1.52 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 0.75 acres
Post-development impervious fraction within drainage basin/outfall area = 0.49

L<sub>M THIS BASIN</sub> = 673 lbs.

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

#### 3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips Removal efficiency = 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<sub>R</sub>) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7:  $L_R = (BMP \text{ efficiency}) \times P \times (A_1 \times 34.6 + A_2 \times 0.54)$ 

where: A<sub>C</sub> = Total On-Site drainage area in the BMP catchment area

> A<sub>I</sub> = Impervious area proposed in the BMP catchment area  $A_P$  = Pervious area remaining in the BMP catchment area

L<sub>R</sub> = TSS Load removed from this catchment area by the proposed BMP

 $A_C =$ 1.52 acres  $A_{l} =$ 0.75 acres  $A_p =$ 0.77 acres  $L_R =$ 740 lbs

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

Desired L<sub>M THIS BASIN</sub> = 673 lbs.

> F = 0.91

### 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 = 1.80 inches

Post Development Runoff Coefficient = 0.35

> On-site Water Quality Volume = 3515 cubic feet

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

Off-site area draining to BMP = 0.00 acres
Off-site Impervious cover draining to BMP = 0.00 acres

Impervious fraction of off-site area = 0
Off-site Runoff Coefficient = 0.00

Off-site Water Quality Volume = 0 cubic feet

Storage for Sediment = 703

Total Capture Volume (required water quality volume(s) x 1.20) = 4218 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 = NA cubic feet

Minimum filter basin area = NA square feet

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

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins = NA cubic feet

Minimum filter basin area = NA square feet

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

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

10. Bioretention System Designed as Required in RG-348 Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin = NA cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool = NA cubic feet Permanent Pool Capacity is 1.20 times the WQV

Required capacity at WQV Elevation = NA cubic feet Cubic feet Cubic feet Capacity should be the Permanent Pool Capacity

plus a second WQV.

12. Constructed Wetlands Designed as Required in RG-348 Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands = NA cubic feet

13. AquaLogic<sup>™</sup> Cartridge System Designed as Required in RG-348 Pages 3-74 to 3-78

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

Required Sedimentation chamber capacity = NA cubic feet
Filter canisters (FCs) to treat WQV = NA cartridges

Filter basin area ( $RIA_F$ ) = **NA** square feet

14. Stormwater Management StormFilter® by CONTECH

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

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

15. Grassy Swales Designed as Required in RG-348 Pages 3-51 to 3-54

Design parameters for the swale:

Drainage Area to be Treated by the Swale = A = 0.00 acres
Impervious Cover in Drainage Area = 0.00 acres

Rainfall intensity = i = 1.1 in/hr
Swale Slope = 0 ft/ft

Side Slope (z) = 0Design Water Depth = y = 0.00 ft Weighted Runoff Coefficient = C = #DIV/0!

$$A_{CS}$$
 = cross-sectional area of flow in Swale = #DIV/0! sf  $P_{W}$  = Wetted Perimeter = #DIV/0! feet  $R_{H}$  = hydraulic radius of flow cross-section =  $A_{CS}/P_{W}$  = #DIV/0! feet  $n$  = Manning's roughness coefficient = 0.2

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

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

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

To calculate the flow velocity in the swale:

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

To calculate the resulting swale length:

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

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

Design Q = CiA = #DIV/0! cfs

Manning's Equation Q = 0.00 cfs Error 1 = #DIV/0! Swale Width= 6.00 ft

Instructions are provided to the right (green comments).

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

Instructions are provided to the right (blue comments).

To solve for bottom v Excel can simultaneo The required "Swale"

First, highlight Cell Fi Then click on "Tools' The value in the "Set The value in the "By Click on solve.

The resulting "Swale If the resulting "Swal

If there is not the opti Click on "Tools" and Then proceed as inst

Design Width =	6 ft		
Design Discharge =	0.00 cfs	Error 2 =	#DIV/0!
Design Depth =	0.33 ft		
Flow Velocity =	0.00 cfs		
Minimum Length =	0.00 ft		

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

#### 16. Vegetated Filter Strips

Designed as Required in RG-348

Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.

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

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

17. Wet Vaults Designed as Required in RG-348 Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 = NA lbs

First calculate the load removal at 1.1 in/hour

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

C = runoff coefficient for the drainage area = 0.32 C = Runoff Coefficient =  $0.546 (IC)^2 + 0.328 (IC) + 0.03$  i = design rainfall intensity = 0.32 L1 in/hour

A = drainage area in acres = 1 acres

Q = flow rate in cubic feet per second = 0.36 cubic feet/sec

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

Q = Runoff rate calculated above = 0.36 cubic feet/sec
A = Water surface area in the wet vault = 150 square feet

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

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

Load removed by Wet Vault = #VALUE! Ibs

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

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

If you would like to in Excel can simultaneo The required "Design

First set the desired I Highlight Cell F232.

Click on "Tools" and The value in the "Set The value in the "By ( Click on solve.

The resulting "Design If the resulting "Design

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

> Resultant TSS Load removed by Wet Vault = #VALUE! Ibs

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

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

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

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E2 be changed from 0.5 to 0.65 on May 3, 2006

 $E_{TOT} = [1 - ((1 - E_1) \times (1 - 0.65E_2) \times (1 - 0.25E_3))] \times 100 =$ 86.38 percent NET EFFICIENCY OF THE BMPs IN THE SERIES

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

EFFICIENCY OF THE SECOND BMP IN THE SERIES = E2 = 70.00 percent

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

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

> $L_R = E_{TOT} X P X (A_I X 34.6 X A_P X 0.54) =$ 751.52 lbs

20. Stormceptor

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

**BMP Sizing** 

Effective Area = EΑ NA

Calculated Model Size(s) = #N/A

Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =

Model Size 0

 $ft^2$ Surface Area = #N/A Overflow Rate =  $V_{or}$ **#VALUE!** Rounded Overflow Rate = **#VALUE!**  $V_{or}$ 

BMP Efficiency % = **#VALUE!** % L<sub>R</sub> Value = #VALUE! lbs

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

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

### 21. Vortech

Required TSS Removal in BMP Drainage Area= NA lbs

Impervious Cover Overtreatment= 0.0000 ac TSS Removal for Uncaptured Area = 0.00 lbs

**BMP Sizing** 

Effective Area = NA EA

Calculated Model Size(s) = #N/A

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

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

Overflow Rate = #VALUE! Vor

Rounded Overflow Rate = #VALUE! V<sub>or</sub>

BMP Efficiency % = #VALUE! %

L<sub>R</sub> Value = #VALUE! Ibs

TSS Load Credit = #VALUE! Ibs

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

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

## **Agent Authorization Form**

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

1	David Disbrow
	Print Name
	Chief Operating Officer
	Title - Owner/President/Other
of _	Capitol Aggregates, Inc.
	Corporation/Partnership/Entity Name
have	e authorizedJ. Brandon Klenzendorf, P.E.
	Print Name of Agent/Engineer
of _	Geosyntec Consultants, 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 those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.
- 3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.
- 4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.
- 5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

## SIGNATURE PAGE:

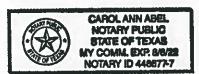
Daid Duil	8/29/18	
Applicant's Signature	Date	_

THE STATE OF TEXAS §

County of Bexar §

BEFORE ME, the undersigned authority, on this day personally appeared <u>Noted Disbood</u>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 29th day of 4405t , 2018.



NOTARY PUBLIC

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 8/6/22

Application Fe	e Form		
<b>Texas Commission on Environm</b>	ental Quality		
Name of Proposed Regulated En	tity: Capitol Aggregates	Solms Operation	
Regulated Entity Location: 1026			.32
Name of Customer: Capitol Aggre			
Contact Person: Paul Detterline		ne: 210-871-7214	
Customer Reference Number (if			
Regulated Entity Reference Num		3939	
Austin Regional Office (3373)	,		
☐ Hays	☐ Travis	□w	'illiamson
San Antonio Regional Office (33	<u> </u>	<del></del>	
Bexar		<b>□</b> υ	valde
<b>⊠</b> Comal	Kinney		
Application fees must be paid by	check, certified check,	or money order, payal	ole to the <b>Texa</b>
Commission on Environmental C			
form must be submitted with yo		•	·
Austin Regional Office	$\boxtimes$ s	an Antonio Regional C	Office
Mailed to: TCEQ - Cashier		overnight Delivery to:	TCEQ - Cashier
Revenues Section	1	2100 Park 35 Circle	
Mail Code 214	E	Building A, 3rd Floor	
P.O. Box 13088	A	ustin, TX 78753	
Austin, TX 78711-3088	(	512)239-0357	
Site Location (Check All That App	ply):		
Recharge Zone	Contributing Zone		ition Zone
Tuno of Die	v.a	Sizo	Too Due

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone		
Plan: One Single Family Residential Dwelling	0 Acres	\$0
Water Pollution Abatement Plan, Contributing Zone		
Plan: Multiple Single Family Residential and Parks	0 Acres	\$0
Water Pollution Abatement Plan, Contributing Zone	WPAP Mod covers	
Plan: Non-residential	~123 Acres	\$ 10,000
Sewage Collection System	0 L.F.	\$0
Lift Stations without sewer lines	0 Acres	\$0
Underground or Aboveground Storage Tank Facility	0 Tanks	\$0
Piping System(s)(only)	0 Each	\$ 0
Exception	0 Each	\$0
Extension of Time	0 Each	\$0

## **Application Fee Schedule**

**Texas Commission on Environmental Quality** 

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

## Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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



## TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175. SECTION I: General Information

SECTION I. General	imomatioi	1												
Reason for Submission     New Permit Registre	•	•					•	vith	the program application	ın )				
Renewal (Core Da					_			_	ner WPAP Modifica					
2. Customer Reference Number (if issued)			F-11-	Follow this link to search for CN or RN numbers in Central Registry**			3 Regulated Entity Reference Number (if issued)							
CN 604033142							in RN 105203939							
SECTION II: Custom	ner Informat	ion	- <u>Ce</u>	<u>ntrai</u>	Kegi	stry"	-							
4. General Customer Info	ormation	5. Effective [	Date for	r Custo	omer Ir	nforma	tion U	pda	ites (mm/dd/yyyy)		4			
New Customer	o (\/orifichle wi		•	to Cus				امعاد	•	-	Entity Ownership			
The Customer Name											active with the			
Texas Secretary of		-	•				•			ii oiit aiia				
6. Customer Legal Name	(If an individual,	print last name	first: e.g	J.: Doe,	John)		Ī	f nev	w Customer, enter prev	ious Custon	ner below:			
Capitol Aggregates, In	ic.						i							
7. TX SOS/CPA Filing Nu	ımber	8. TX State 1	ax ID	(11 digits)	)		9	. Fe	ederal Tax ID (9 digits)	10. DUN	S Number (if applicable)			
801525417		174273122	255				7	742	731225	008119	9422			
11. Type of Customer:		on			Individ	ual								
Government: City Co	ounty 🔲 Federal [	State Other			Sole P	ropriet	orship	,	Other:		Line III			
12. Number of Employee	s								ndependently Owned	and Operate	ed?			
0-20 21-100	<b></b> 101-250	251-500	5	01 and	d highe	er		X Y	′es					
14. Customer Role (Propo	sed or Actual) -	as it relates to th	ne Regu	ılated E	Intity lis	ted on	his for	rm. F	Please check one of the f	ollowing:				
Owner	Opera	ator		× 0	wner &	Opera	itor							
Occupational Licenses		nsible Party		□ vc	oluntar	y Clear	iup A	pplic	cant Other:					
P.O. Box	33240													
15. Mailing Address:				T,						W 1				
	San Antonio		St	ate	TX		ZIP	7	8265	ZIP + 4	3240			
16. Country Mailing Inform	nation (if outside	USA)				17. E	-Mail	Add	ress (if applicable)					
				W.		paul.c	lette	etterline@capitolaggregates.com						
18. Telephone Number		ì	19. Ex	19. Extension or Code				20. Fax Number (if applicable)						
( 210 ) 871 - 7214							( 210 ) 599 - 1709							
SECTION III: Regula	ted Entity Ir	nformation												
21. General Regulated En	tity Information	(If `New Regu	lated E	ntity" i	s selec	ted be	low th	nis fo	orm should be accomp	anied by a	permit application)			
New Regulated Entity	Update	to Regulated E	ntity N	lame	$\times$	Update	to Re	egul	ated Entity Information	1				
The Regulated Enti-	-			-	ed in	orde	r to I	me	et TCEQ Agency	Data Star	ndards (removal			
of organizational ea					ction is	takina :	lace \		_					
ZZ. Negulated Entity Name	- (Line) hame of	uic site Wilele (	ie regu	iaicu di	CHOIT IS	takiiy	лас <del>с</del> .)							
Capitol Aggregates So	olms Operati	on												

Form instructions for additional guidance.  Dam Safety Districts Edwards Aquifer Emissions Inventory Air Industrial Hazardous Waste  13-15021001 Petroleum Storage Tank PWS  Comal Co permit 103831 Used Oil  Sludge Storm Water Title V Air Tires Used Oil  Voluntary Cleanup Waste Water Wastewater Agriculture Water Rights Other:  SECTION IV: Preparer Information	23. Street Address of the	1026 Solms Quarry Road												
Enter Physical Location   Project entrance is on the north side of FM 482 approximately 1,200 feet to the west of the intersection of Marigold Way and FM 482.   28. Nearest City	,	City New Braunfels State TX						ZIP	7	8132	3652			
Enter Physical Location Description if no street address is provided.  25. Description to Project entrance is on the north side of FM 482 approximately 1,200 feet to the west of the intersection of Marigold Way and FM 482.  26. Nearest City	24. County	Con	nal County	П										
25. Description to Physical Location:   Project entrance is on the north side of FM 482 approximately 1,200 feet to the west of the intersection of Marigold Physical Location:   State				Locati	ion Descripti	ion if n	o stree	t address	is prov	/ided.				
New Braunfels			ct entrance is on the						Ė		the inte	rsection	n of Marigold	
27. Latitude (N)   In Decimal:   29.663533   28. Longitude (W)   In Decimal:   -98.206273   -98.   29. Primary Bull Code (4 digits)   30. Seconds   48.72   -98.   12   22.56   -98.   12   22.56   -98.   12   22.56   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -98.   -	26. Nearest City								Sta	ate		Nea	arest ZIP Code	
Degrees	New Braunfels	10.1							(T)			78	132	
29	27. Latitude (N) In Decim	al:	29.663533				28. L	ongitude (	N) I	n Decimal:	-98.206	273		
29. Primary SIC Code (4 digits) 30. Secondary SIC Code (4 digits) 31. Primary NAICS Code (5 or 6 digits) 32. Secondary NAICS Code (5 or 6 digits) 33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)  Quarry  34. Mailing Address: City San Antonio State TX ZIP 78265 ZIP + 4 3240  35. E-Mail Address: paul.deterfine@capitolaggregates.com 36. Telephone Number paul.deterfine@capitolaggregates.com 37. Extension or Code 37. Fax Number (if applicable) (210 ) 871 - 7214 (210 ) 599 - 1709  39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Date Form instructions for additional guidance. Dam Safety Districts Edwards Aquifer Emissions Inventory Air Industrial Hazardous Waste Municipal Solid Waste New Source Review Air Source Compact Programs and Waste Permits and State	Degrees	Minute	es .	Secor	nds		Degree	es		Minutes		Seconds		
22.5. Finally Store Godients of Store Review 1 (5 or 6 digits) (6 or 70 digits) (7 o	29	39		48.7	2		-98			12	2	22.58		
33. What is the Primary Business of this entity? (Co not repeat the SIC or NAICS description.)  34. Mailing Address:  City San Antonio State TX ZIP 78265 ZIP + 4 3240  35. E-Mail Address: paul.detterline@capitolaggregates.com  36. Telephone Number 37. Extension or Code 38. Fax Number (if applicable)  (210 ) 871 - 7214 (210 ) 599 - 1709  39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Date Form instructions for additional guidance.  Dam Safety Districts Edwards Aquifer Emissions Inventory Air Industrial Hazardous Waste  13-15021001	29. Primary SIC Code (4 dig	its)	30. Secondary SIC	Code	(4 digits)				Code			y NAICS	S Code	
Address:    P.O. Box 33240	1422		and the			21:	2312							
Address:  City San Antonio State TX ZIP 78265 ZIP + 4 3240  35. E-Mail Address: paul.detterline@capitolaggregates.com  36. Telephone Number 37. Extension or Code 38. Fax Number (if applicable)  (210 ) 871 - 7214 (210 ) 599 - 1709  39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Date Form instructions for additional gludance.  Dam Safety Districts Edwards Aquifer Emissions Inventory Air Industrial Hazardous Waste  13-15021001  Municipal Solid Waste New Source Review Air SOSF Petroleum Storage Tank PWS  Comal Co permit 103831  Sludge Storm Water Title V Air Tires Used Oil  Voluntary Cleanup Waste Water Wastewater Agriculture Water Rights Other:  SECTION IV: Preparer Information  40. Name: J. Brandon Klenzendorf  41. Title: Project Engineer  42. Telephone Number 43. Ext./Code 44. Fax Number 45. E-Mail Address  (512 ) 354 - 3281 () - bklenzendorf@geosyntec.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 o submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.  Company: Geosyntec Consultants, Inc.  Namelin Prints: J. Brandon Klenzendorf  Phone: (612) 8561-8281	33. What is the Primary Bus	siness	of this entity? (Do no	ot repea	at the SIC or NA	AICS de	scription	.)						
Address:    City   San Antonio   State   TX   ZIP   78265   ZIP + 4   3240	Quarry													
Address:  City San Antonio State TX ZIP 78265 ZIP + 4 3240  35. E-Mail Address: paul.detterfine@capitolaggregates.com  36. Telephone Number State (210 ) 871 - 7214  37. Extension or Code (210 ) 599 - 1709  39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Date Form instructions for additional guidance.  Dam Safety Districts Edwards Aquifer Emissions Inventory Air Industrial Hazardous Waster  Municipal Solid Waste New Source Review Air OSSF Petroleum Storage Tank PWS  Sludge Storm Water Title V Air Tires Used Oil  Voluntary Cleanup Waste Water Wastewater Agriculture Water Rights Other:  SECTION IV: Preparer Information  40. Name: J. Brandon Klenzendorf 41. Title: Project Engineer  42. Telephone Number 43. Ext./Code 44. Fax Number 45. E-Mail Address  (512 ) 354 - 3281 () - bklenzendorf@geosyntec.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 of submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.  Company: Geosyntec Consultants, Inc.  Name(In Print): J. Brandon Klenzendorf Phone: (512) 1854 - 3281		P.O.	Box 33240											
City San Antonio State TX ZIP 78265 ZIP + 4 3240  35. E-Mail Address: paul.detterline@capitolaggregates.com  36. Telephone Number	· ·													
35. E-Mail Address: paul.detterline@capitolaggregates.com 36. Telephone Number 37. Extension or Code 38. Fax Number (if applicable) (210 ) 871 - 7214 (210 ) 599 - 1709  39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Date Form instructions for additional guidance.  Dam Safety Districts Edwards Aquifer Emissions Inventory Air Industrial Hazardous Waste New Source Review Air Soss Petroleum Storage Tank PWS  Comal Co permit 103831  Sludge Storm Water Title V Air Tires Used Oil  Voluntary Cleanup Waste Water Wastewater Agriculture Wastewater Rights Other:  SECTION IV: Preparer Information  40. Name: J. Brandon Klenzendorf 41. Title: Project Engineer 42. Telephone Number 43. Ext./Code 44. Fax Number 45. E-Mail Address (512 ) 354 - 3281 () - bklenzendorf@geosyntec.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 os submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.  Company: Geosyntec Consultants, Inc.  Name(In Print): J. Brandon Klenzendorf Phone: (512) 954 - 3281	Address:	City	San Antonio	T	State	Т	x	7ID	7	8265	7	ID + 1	3240	
36. Telephone Number (210 ) 871 - 7214 (210 ) 599 - 1709  39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Date Form instructions for additional guidance.  Dam Safety Districts Edwards Aquifer Emissions Inventory Air Industrial Hazardous Waste 13-15021001  Municipal Solid Waste New Source Review Air SOSF Petroleum Storage Tank PWS  Comal Co permit 103831  Sludge Storm Water Title V Air Tires Used Oil  Waste Water Wastewater Agriculture Water Rights Other:  SECTION IV: Preparer Information  40. Name: J. Brandon Klenzendorf 41. Title: Project Engineer  42. Telephone Number 43. Ext./Code 44. Fax Number 45. E-Mail Address  (512 ) 354 - 3281 () bklenzendorf@geosyntec.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 os submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.  Company: Geosyntec Consultants, Inc.  Name(In Print): J. Brandon Klenzendorf Phone: (512) 354 - 3281	35 F-Mail Address:	Jony		oitolac		_	<u> </u>		1.			11 1 4	102.10	
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Name(In Print): J. Brandon Klenzendorf Phone: (512)354-3281	46. By my signature below, I ce	rtify, to	the best of my knowledg										gnature authority	
	Company: Geosyntec C	onsulta	ints, Inc.				4	Job Title	Pro	ject Engineer		114		
Signature: J. Brandon Klydl Date: 9.12.2018	Name(In Print): J. Brandon Klenzendorf							Phone:	(512)354-3281					
	Signature: J. Brand	or	Klyohs		-			Date:	9	12.20	१४			

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