Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, June 8, 2023 8:27 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: autogeek69@gmail.com <autogeek69@gmail.com>
Sent: Thursday, June 8, 2023 7:46 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: William Adams

EMAIL: autogeek69@gmail.com

COMPANY:

ADDRESS: 2235 MERITAGE
NEW BRAUNFELS TX 78132-3943

PHONE: 7138054507

FAX:

COMMENTS: I would like to understand if a study on the impact of the Comal river has been done and concluded that there will be no change to the water my family use for recreation. Since the rivers are dry and wet, irrigation of land is the solution for the hill country as we have the best crystal clear spring fed rivers that are used by thousands of Texas families. The Comal, Guadalupe, and Frio rivers are the lively hood for Texans and the City/counties they support. Hundred of cities/MUD districts are using the gray water for irrigation to conserve potable water use. This is extremely important in the Texas hill county and Engineers and cities have formed alliances to keep our water supplies from getting contaminated. What do they say about this?

Did not speak

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Cindy Agee

Mailing Address: 130 E. Lincoln

Physical Address (if different): _____

City/State: New Braunfels **Zip:** 78130

This information is subject to public disclosure under the Texas Public Information Act

Email: cagee@aol.com

Phone Number: (512) 751 8286

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

☑ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

I am opposed to any discharge of any kind being added to the Dry Comal River or the Comal River.

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 2:18 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: tim.altman95@gmail.com <tim.altman95@gmail.com>
Sent: Monday, February 27, 2023 7:45 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Timothy James Altman

EMAIL: tim.altman95@gmail.com

COMPANY:

ADDRESS: 30635 HORSESHOE PATH
BULVERDE TX 78163-2318

PHONE: 8176894353

FAX:

COMMENTS: I am the co-owner of 2535 Shearer Rd Bulverde, TX 78163. The West Dry Comal Creek flows through my property downstream from this proposed permit. Looking at a map of the current floodplain, it looks as if the additional effluent may render most of the property unusable.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, June 7, 2023 3:11 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: jenlyn0110@yahoo.com <jenlyn0110@yahoo.com>
Sent: Wednesday, June 7, 2023 2:40 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Jennifer Ashley

EMAIL: jenlyn0110@yahoo.com

COMPANY:

ADDRESS: 1145 TURTLE TRL
NEW BRAUNFELS TX 78130-5462

PHONE: 3129196787

FAX:

COMMENTS: This is literally my back yard. "Even when treated, sewage effluent contains nutrients (such as phosphorus and nitrogen) that can lead to unsightly, smelly algae blooms that deprive the water of oxygen and kill fish." Please don't do this.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, June 7, 2023 5:02 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: bernard.m@sbcglobal.net <bernard.m@sbcglobal.net>
Sent: Wednesday, June 7, 2023 5:01 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Mark Bernard

EMAIL: bernard.m@sbcglobal.net

COMPANY:

ADDRESS: 317 MARY BLVD
NEW BRAUNFELS TX 78130-2956

PHONE: 2108844401

FAX:

COMMENTS: There is not adequate information on this application to make a determination. There is reference to the discharge of treated wastewater into the Dry Comal Creek which dumps into the Comal Creek which combines with the Guadalupe River to form a number of critical lakes that support wildlife, tourism and borders the home of so many residents in Comal and Guadalupe Counties. I am adamantly opposed to this permit without more knowledge and troubled that this has not been made more public especially at a time where these lakes have been compromised by the failed dams/gates in recent years. In addition, one can only assume that this wastewater would be at a very different water temperature affecting the appeal of the rivers and wildlife habitat as well i.e. trout do not live in warmer waters

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Paige Bonner

Mailing Address: 22911 Malabar PK

Physical Address (if different): _____

City/State: San Antonio, TX **Zip:** 78261

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: paigebonner15@gmail.com

Phone Number: (304) 593-3417

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

See back

Please give this form to the person at the information table. Thank you.

- Consider endangered/protected Species in the area

- impact of discharge on insect population, in particular mosquitoes + the impact of arboviruses such as West nile virus on humans + livestock

- Female owned dressage business for lessons + breeding is the only one in the ~~area~~ county for an Olympic sport.

Thomas Lee

From: PUBCOMMENT-OCC
Sent: Friday, July 14, 2023 1:34 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: mandam47@yahoo.com <mandam47@yahoo.com>
Sent: Thursday, July 13, 2023 6:56 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: MRS Ann Marie Bruno-Rakowitz

EMAIL: mandam47@yahoo.com

COMPANY:

ADDRESS: 29550 FM 3009
NEW BRAUNFELS TX 78132-2601

PHONE: 2104523597

FAX:

COMMENTS: Truly concerned about the location of this tract given this is a water retention area. Also concerned about what water is being used for here as there are do many homes and neighborhoods in close proximity.

Jennifer Cox

From:	PUBCOMMENT-OCC
Sent:	Wednesday, September 25, 2024 12:21 PM
To:	PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject:	FW: Public comment on Permit Number WQ0016211001

Jesús Bárcena
Office of the Chief Clerk
Texas Commission on Environmental Quality
Office Phone: 512-239-3319

How is our customer service? Fill out our online customer satisfaction survey at:
www.tceq.texas.gov/customersurvey

From: Buckpottery@gmail.com <Buckpottery@gmail.com>
Sent: Wednesday, September 25, 2024 10:54 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Warren Don Buck

EMAIL: Buckpottery@gmail.com

COMPANY:

ADDRESS: 1191 EDWARDS BLVD
NEW BRAUNFELS TX 78132-4053

PHONE: 8307081472

FAX:

COMMENTS: I request a contested case hearing as I swim daily in the Comal river for the past 15 plus years and have recreated in the Comal River off and on for the past 42 years. I claim that this makes me an "affected person" different from the general public that may not be in contact with this waterway as frequently. Any additional discharge into the dry Comal creek concerns me greatly especially human waste, which are known to result in gastrointestinal, respiratory as well as skin diseases. I consider all water sheds, creeks and rivers to be holy places as they harbor the water that sustains all life. I can only lobby for my community to keep its water sheds clean. I fear approval of this permit will set a precedent for future discharges into the dry Comal Creek. I therefore request that this permit be reviewed very thoroughly to ensure that the strictest standards be applied in this case regardless of monetary cost as the environmental cost is too high to act in any other way.

TCEQ Registration Form
June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Warren Buck

Mailing Address: 1191 Edwards Blvd

Physical Address (if different): _____

City/State: New Braunfels TX **Zip:** 78132

This information is subject to public disclosure under the Texas Public Information Act

Email: buckpotter@gmail.com

Phone Number: (830) 708-1472

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Warren Buck

1. Is there a precedent of treated waste water being released into the dry canal creek watershed? And what follow up studies have been done to assure that they are keeping the streams natural and safe?

2. Make the application dependent on the re-use of the water on the property where it's treated. If it does not get reused, the application should not be approved.
Is this a possible requirement for approval?

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:12 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: h0bv2m@gmail.com <h0bv2m@gmail.com>
Sent: Monday, February 27, 2023 12:09 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Tracy Byrne

EMAIL: h0bv2m@gmail.com

COMPANY:

ADDRESS: 1191 POWDER RIDGE RD
NEW BRAUNFELS TX 78132-3438

PHONE: 5712519818

FAX: 5712519818

COMMENTS: Request a public meeting!

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 2:21 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: npcadam@yahoo.com <npcadam@yahoo.com>
Sent: Monday, February 27, 2023 3:04 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Adam Carabajal

EMAIL: npcadam@yahoo.com

COMPANY:

ADDRESS: 395 SUGARCANE
NEW BRAUNFELS TX 78132-0151

PHONE: 4155210432

FAX:

COMMENTS: No way you can approve dumping sewage every day. Please stop this. A permit application has recently been filed to dump up to 600,000 gallons of treated sewage—every day—into the West Fork Dry Comal Creek and Dry Comal Creek, which flow into the Comal River in New Braunfels.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:03 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: jwcarson06@sbcglobal.net <jwcarson06@sbcglobal.net>
Sent: Sunday, February 26, 2023 2:07 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Jennifer Carson

EMAIL: jwcarson06@sbcglobal.net

COMPANY:

ADDRESS: 391 HERAUF DR
CANYON LAKE TX 78133-3118

PHONE: 2103854645

FAX:

COMMENTS: - Request a public meeting on this permit. - Permit application should be denied due to ——Potential negative impact on groundwater quality ——Potential negative impact on area streams and rivers ——No plan for beneficial reuse or land application (TLAP) ——Potential negative impact on area caves and caverns

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, March 2, 2023 1:51 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: RobCartyEsq@gmail.com <RobCartyEsq@gmail.com>
Sent: Thursday, March 2, 2023 8:12 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: MR Robert J. Carty, JR

EMAIL: RobCartyEsq@gmail.com

COMPANY:

ADDRESS: 195 SPIRIT CIR
SPRING BRANCH TX 78070-5022

PHONE: 2816857562

FAX:

COMMENTS: Our beautiful Texas Hill Country is dying the death of a thousand cuts. We don't have the natural resources to support yet another quarry operation, let alone the wastewater and other pollutants it will generate. Yes, we've heard Vulcan's promises to "treat" the water before injecting it back into the watershed. But we can ill afford Vulcan's remarkable daily consumption of 600,000 gallons of increasingly scarce water in the first place. Even as a longtime proponent and defender of private enterprise, I can't deny the history of large-scale corporate failures to comply with

regulations. It's a big risk to impose on a one-of-a-kind community -- a true Texas treasure. This isn't a sealed pipeline or some other operation that can reliably insulate itself from harming others. Quite the contrary: It's a noisy, dust-producing, water-consuming, and potentially aquifer-depleting and groundwater-polluting open sore, being imposed on innocent residents in the middle of a historic drought and unprecedented influx of new residents. Something has to give, and that something shouldn't be the Hill Country and the families who live here. I ask that TCEQ take the following actions: * Conduct a public meeting so that you can see the impact that the requested permit will have. * Deny the permit application. We Hill Country residents pay our taxes and have done nothing wrong. Yet these companies barge in and threaten to wreck everything we have worked so hard for. Please do the right thing.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, March 2, 2023 1:51 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: RobCartyEsq@gmail.com <RobCartyEsq@gmail.com>
Sent: Thursday, March 2, 2023 8:12 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: MR Robert J. Carty, JR

EMAIL: RobCartyEsq@gmail.com

COMPANY:

ADDRESS: 195 SPIRIT CIR
SPRING BRANCH TX 78070-5022

PHONE: 2816857562

FAX:

COMMENTS: Our beautiful Texas Hill Country is dying the death of a thousand cuts. We don't have the natural resources to support yet another quarry operation, let alone the wastewater and other pollutants it will generate. Yes, we've heard Vulcan's promises to "treat" the water before injecting it back into the watershed. But we can ill afford Vulcan's remarkable daily consumption of 600,000 gallons of increasingly scarce water in the first place. Even as a longtime proponent and defender of private enterprise, I can't deny the history of large-scale corporate failures to comply with

regulations. It's a big risk to impose on a one-of-a-kind community -- a true Texas treasure. This isn't a sealed pipeline or some other operation that can reliably insulate itself from harming others. Quite the contrary: It's a noisy, dust-producing, water-consuming, and potentially aquifer-depleting and groundwater-polluting open sore, being imposed on innocent residents in the middle of a historic drought and unprecedented influx of new residents. Something has to give, and that something shouldn't be the Hill Country and the families who live here. I ask that TCEQ take the following actions: * Conduct a public meeting so that you can see the impact that the requested permit will have. * Deny the permit application. We Hill Country residents pay our taxes and have done nothing wrong. Yet these companies barge in and threaten to wreck everything we have worked so hard for. Please do the right thing.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, August 9, 2023 10:53 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: jeffcoulter1993@duck.com <jeffcoulter1993@duck.com>
Sent: Tuesday, August 8, 2023 8:56 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: MR Jeff Coulter

EMAIL: jeffcoulter1993@duck.com

COMPANY:

ADDRESS: 2554 RAUSCHENBACH
NEW BRAUNFELS TX 78132-0143

PHONE: 5023781981

FAX:

COMMENTS: The Edwards Aquifer contributing and recharge zones are the worst place to dump 600,000 gallons (an Olympic-size swimming pool) of treated sewage every day. It would have a potential negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer), area springs, streams, and rivers (Dry Comal Creek, Comal River, Guadalupe River) and caves and caverns. A beneficial reuse or land application permit (TLAP) would be much better than a discharge permit. Please deny this permit application.

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Tim Cronin

Mailing Address: 152 Pennsylvania Blvd

Physical Address (if different): _____

City/State: New Braunfels, TX **Zip:** 78130

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: tim@timcronin.com

Phone Number: ( )

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ ~~No~~

  If yes, which one? _____

☐ **Please add me to the mailing list.**

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

The permit, as it appears online, shows that only the unknown operator (Mr. Harrison) is responsible for the compliance with TCEQ rules.

Please give this form to the person at the information table. Thank you. (over)

TCEQ should deny this permit because the only monitor of compliance is the operator. Much more investigation into the permit is needed. A hazard is being created if approved and the only real winners will be the Texas legal community.

There very much needs to be some overseeing body (a MUD or a PUD) that provides recourse for non compliance.

You know and I know that we're not going to drink the effluent out of that system. You may be able to go back to Austin and not deal with it. We residents have to deal with it or sue ~~the~~ Mr Harrison and we all know he has deep pockets.

This development should have to comply with county rules regarding lot size and well/septic requirements.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Friday, June 9, 2023 9:07 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: tim@timcronin.com <tim@timcronin.com>
Sent: Thursday, June 8, 2023 4:35 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: MR Tim Cronin

EMAIL: tim@timcronin.com

COMPANY:

ADDRESS: 152 PENNSYLVANIA BLVD
NEW BRAUNFELS TX 78130-6053

PHONE: 8307083080

FAX:

COMMENTS: I wish to express my opposition to this permit. Development in the county not controlled by ETJ or municipal rules should be restricted to the already established rules. If building homes and well and septic are required, the rules clearly set up are for a minimum of 5 acres per home. If there is a common water source, then building is permitted with homes on 1 acre lots with a septic system - usually aerobic in the rocky hill country. There is no need for overdevelopment out in the county and this permit application is an attempt to circumvent the established rules. This poses a big opportunity for an environmental mishap that would seriously impair the economic well being of New Braunfels and its surrounding area. Much of our economy depends on the attraction of the Comal River . Why would we

take a chance that the effluent from this proposed development could find its way into the Comal River and, by definition, into the Guadalupe River as well. If you take the time to walk across the San Antonio Street bridge and look down into the clear, cool waters that actually are the reason this city exists, how could you even consider approving a permit for a sewage plant 20 miles away that would operate with no accountable supervision or government authority? The only real driver here is greed. Please reject this permit application and require that development of this property adhere to the already established rules of rural development.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 1:44 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: catbc123@gmail.com <catbc123@gmail.com>
Sent: Tuesday, February 28, 2023 9:47 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Catherine Croom

EMAIL: catbc123@gmail.com

COMPANY:

ADDRESS: 30412 HEIMER CV cathy.david.tx@gmail.com
BULVERDE TX 78163-4594

PHONE: 8309806161

FAX:

COMMENTS: This permit application should be denied because of: Potential negative impacts on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). Potential negative impacts on area streams and rivers (Dry Comal Creek, Comal River, Guadalupe River). There is no plan for beneficial reuse or land application (TLAP) and there should be. Potential negative impact on area caves and caverns. There should be a public meeting about this permit request to allow our input.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 2:24 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: kathy.cyr67@gmail.com <kathy.cyr67@gmail.com>
Sent: Monday, February 27, 2023 2:04 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Kathleen Cyr

EMAIL: kathy.cyr67@gmail.com

COMPANY:

ADDRESS: 1539 CONNETTERE
NEW BRAUNFELS TX 78132-2777

PHONE: 8477102432

FAX:

COMMENTS: I believe this permit application should be denied due to the potential negative impact on groundwater quality, area streams and rivers, and on area caves and caverns. TCEQ should, at the very least, hold a public meeting prior to making any decision on this permit

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:45 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: radavila@gmail.com <radavila@gmail.com>
Sent: Saturday, February 25, 2023 5:49 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Robert Davila

EMAIL: radavila@gmail.com

COMPANY:

ADDRESS: 2225 APPELLATION
NEW BRAUNFELS TX 78132-2774

PHONE: 8307432208

FAX:

COMMENTS: Please do not let this occur. Comal is known for its beauty and its landscape. Many of us built our houses here because of the love of the Texas hill country. Dumping sewage water treated or not would have a devastating effect on the agriculture and wildlife in the area. Many of us use well water as well and toxicities can have a devastating effect. In addition the 30+% of loss of property value.

TCEQ Registration Form
June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: CAROLA DAVIS

Mailing Address: 2802 W. State Hwy 46, New Braunfels, 78132

Physical Address (if different): _____

City/State: _____ **Zip:** _____

This information is subject to public disclosure under the Texas Public Information Act

Email: Crayola2802@gmail.com

Phone Number: (830) 609-5555

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

I own property on the Comal River and have grave concerns over any effluent discharged into the river. Our oversight of these issues are inadequate!

Please give this form to the person at the information table. Thank you.

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Jeff L Davis

Mailing Address: 726 Encino Dr., NB TX 78130

Physical Address (if different): _____

City/State: NB **Zip:** 78130

This information is subject to public disclosure under the Texas Public Information Act

Email: patmarain@att.net

Phone Number: (969) 774-7665

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

My concern is the future health of the Comal River. As a frequent swimmer in the river, I can see the effects that drought has on the river bottom and the river bottom. The wastewater permit and the potential housing development will negatively affect the health of the river. The river is key to the tourist industry of New Braunfels & it should be protected for future generations. This area is popular for new housing developments, but this needs to be balanced with the health of the river. Please do not allow the permit for wastewater. 600,000 gallons of treated sewage daily will adversely affect the Comal River as the treated sewage is the fork of the Dry Comal.

Thank you, Jeff Davis

Jeff Davis

~~In your analysis~~

1. Did TCEQ review the effects of drought? 195 cfs today, in an El Niño Not historical patterns, but future

2. Did TCEQ review the effects on native fish & river animals? Did it consider effects on the Fountain Darter. There are FD in the Canal River, not just the lake

3. Can you tell me an incidence when you denied a permit? What were the factors?

4. Can you tell me a success story where this was done on a river,

5. ~~Can you~~ Tell me about the upper Blanco & downstream Blanco, algae & incidence of fish

The information presented here is provided for educational and informational purposes only. It is not legal advice and does not create an attorney-client relationship. The law is constantly changing, and the application of legal principles can vary widely depending on the specific circumstances of each case. You should not rely on this information as legal advice and should speak with an attorney to receive legal advice tailored to your particular situation.

Remember, if you are requesting a contested case hearing, you MUST submit the issues that you would like to bring up in your hearing with the formal or written comments you submit tonight.

Here is a short list of issues that may or may affect your perspective or situation:

- The operator is not listed on the application
- Operator compliance history
- Risk of contamination of groundwater
- The application is inaccurate
- The permitted discharge may affect endangered and threatened species
- The location of the facility is unsuitable due to active geological processes (erosion evident by caves)
- The location of the discharge is unsuitable due to a 100-yr floodplain on the facility boundary and along the discharge route
- The discharge would result in the degradation of the West Fork of Dry Comal Creek and the Dry Comal Creek and Comal River watersheds and the Edwards Aquifer

You can submit your comments in writing by the end of the meeting. Be sure to request a contested hearing if you feel you are an affected party. Refer to the Public Participation Guide for tips on making sure your input is considered.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Friday, June 9, 2023 9:10 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: jenniferjddavis@aol.com <jenniferjddavis@aol.com>
Sent: Thursday, June 8, 2023 2:20 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Jennifer Davis

EMAIL: jenniferjddavis@aol.com

COMPANY:

ADDRESS: 626 ASHMORE ST
NEW BRAUNFELS TX 78130-4602

PHONE: 8322210131

FAX:

COMMENTS: To Whom This Concerns: I live very close to the Comal River in New Braunfels. I've recently heard of this permit and project and plans. I am AGAINST treated sewage being dumped into the dry creek Comal beside we are over the edwards aquifer. No thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:06 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: joanndebo@gmail.com <joanndebo@gmail.com>
Sent: Sunday, February 26, 2023 6:12 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: JoAnn Debo

EMAIL: joanndebo@gmail.com

COMPANY:

ADDRESS: 1355 RANCH PKWY Apt. 622
NEW BRAUNFELS TX 78130-3987

PHONE: 2062496897

FAX:

COMMENTS: This permit application should be denied based on the potential devastating impact to the Edwards Aquifer, the Comal River, and the local cave and cavern systems.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 1:16 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: kfdeluca@entouch.net <kfdeluca@entouch.net>
Sent: Monday, February 27, 2023 12:15 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: MS Kimberly DeLuca

EMAIL: kfdeluca@entouch.net

COMPANY:

ADDRESS: 5656 COPPER VLY
NEW BRAUNFELS TX 78132-3918

PHONE: 7132890928

FAX:

COMMENTS: Please DO NOT approve the permit application without holding a public meeting! This has the potential to ruin our water supply to THOUSANDS of Comal County residents! Not to mention the rivers and streams that feed the the tourism industry in this beautiful part of Texas. Thank you for your consideration in this extremely important topic! Sincerely, Kim Deluca

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, June 5, 2023 8:51 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001
Attachments: swri-wastewater-discharge-edwards-aquifer-contributing-zone-100.pdf

From: david@drewadesigns.com <david@drewadesigns.com>
Sent: Sunday, June 4, 2023 5:53 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: David A. Drewa

EMAIL: david@drewadesigns.com

COMPANY:

ADDRESS: 21406 ENCINO LOOKOUT
SAN ANTONIO TX 78259-2656

PHONE: 2104815335

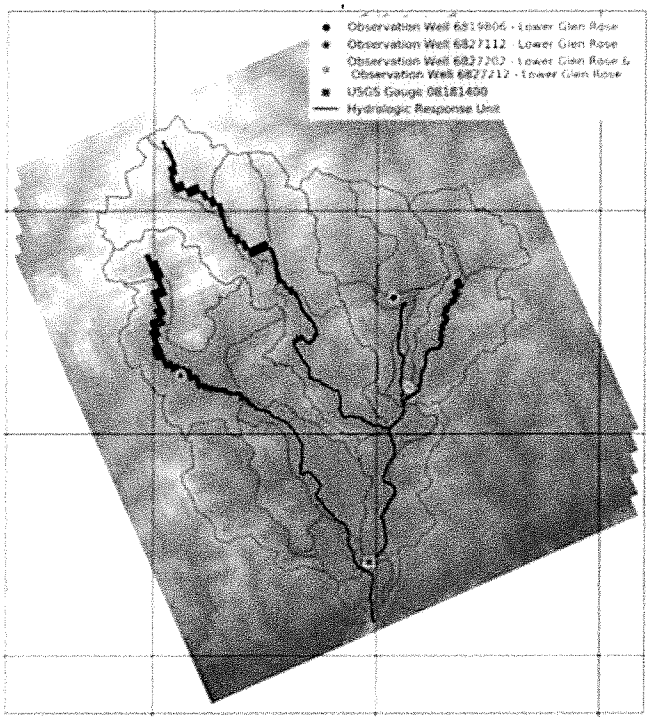
FAX:

COMMENTS: Has the attached study (Comparative Evaluation of Wastewater Disposal Practices in the Contributing Zone of the Edwards Aquifer by Southwest Research Institute) been thoroughly reviewed and studied in light of the impact of *this particular* wastewater discharge permit over the Edwards Aquifer Contributing Zone? If not, why not? If not, please review the report thoroughly and respond accordingly before any further evaluation or approval of this permit. Thank you. *** The City of San Antonio Edwards Aquifer Protection Program (EAPP) was expanded when it was renewed in 2015 to provide funding for research and data acquisition on the Edwards Aquifer. As part of that program, Southwest

Research Institute® (SwRI) was chosen to evaluate wastewater disposal in the recharge and contributing zones of the Edwards Aquifer using an integrated hydrologic model. The principal objective of the project was to compare the relative impact that different wastewater disposal facilities would have on the quality of water recharged to the Edwards Aquifer. Wastewater disposal facilities considered as part of the evaluation included on-site sewage facilities (OSSF), Texas Land Application Permit (TLAP), and Texas Pollutant Discharge Elimination Systems (TPDES). A requirement of the EAPP research and data acquisition program was that funded projects must be located in Bexar County, Texas. Helotes Creek watershed, which is wholly contained in Bexar County, was selected as the study site for the SwRI project. Periphyton and sestonic sampling and analysis indicate that the current trophic state of the Helotes Creek watershed is oligotrophic and possibly slightly mesotrophic which suggests that the stream and watershed have been marginally impacted by wastewater discharges. An objective of the SwRI project is to determine the impact that different wastewater facility types would have on the trophic state of Helotes Creek watershed and the quality of water from the watershed that recharges the Edwards Aquifer. Currently, OSSFs are the only type of wastewater disposal facility in the Helotes Creek watershed. Analysis of water samples from wells and surface-water bodies provide a measure of how the existing OSSFs have impacted local water quality. Numerical and analytical models were developed to estimate the impact that OSSF, TLAP, or TPDES wastewater facilities would have on water quality in Helotes Creek watershed and the quality of water from the watershed that recharges the Edwards Aquifer. An integrated hydrologic model of Helotes Creek watershed was developed to generate surface-water/groundwater regimes of the study area. A transport model calculated transport rates and masses for different reservoirs predicated on flows simulated with the integrated hydrologic model. Total nitrogen was designated as the conservative constituent of interest in the transport simulations. These models were used to predict the impact to the quality of water recharged to the Edwards Aquifer from a variety of OSSF scenarios and from hypothetical TLAP and TPDES wastewater facilities in Helotes Creek watershed. The integrated hydrologic model developed for Helotes Creek watershed incorporated all available information and data for the study site. Nonetheless, during development of the model, it became apparent that this information and data were insufficient to develop a robust comprehensive model of the study domain. Although this shortcoming limits the model when attempting to make detailed, high-resolution predictions of flow and transport in the Helotes Creek watershed, the model is shown to be useful and defensible when making comparative assessments in which the foundational conceptualizations are the same for the cases being compared. A Base Case model was constructed to replicate, to the degree possible, mass loading from OSSFs currently present in Helotes Creek watershed. Mass loading for the Base Case was calculated using the transport model predicated on flows generated using the integrated hydrologic model. Mass loadings from eight alternative scenarios were then calculated using the same modeling assembly to evaluate the anticipated impact that various OSSF operational performances, a TPDES, and four different TLAP facilities within the Helotes Creek watershed would have on the quality of water recharged to the Edwards Aquifer. Two locations in the watershed were considered for the location of the TLAPs, one in the less-developed upgradient northern portion of the watershed and one in the more-developed southern portion. The TPDES was placed in the southern portion of Helotes Creek watershed. OSSFs in the model were removed from the area proximal to the hypothetical wastewater disposal facilities. Mass loading from each TLAP system was predicated on the size of the land available at each site, 32 acres at the northern location and 13 acres at the southern location. Volumetric wastewater volumes discharged in the one TPDES and the four TLAP scenarios varied from 0.05 to 0.86 million gallons per day (MGD). Similarly, nitrogen loadings varied from 33.2 to 99.2 kg/d. Mass loadings assigned to the TLAP and TPDES facilities are consistent with comparably-sized facilities in Texas. Due to its greater acreage, mass loading disposal at the northern TLAP location (32 acres) was greater than loading at the southern location (13 acres), hence mass loading to recharge of the Edwards Aquifer was greater for scenarios that represented facilities at the northern location. The size and capacity of the hypothesized wastewater facilities in the TLAP and TPDES scenarios were reasonable and consistent with possible residential development in the study area. Capacity of the TPDES and TLAP facilities was sufficient for upwards of 4,800 homes covering almost 1,800 acres. Residential developments of this size are conceivable within the 15,640 acres of the Helotes Creek watershed. Accordingly, the nitrogen mass load from the candidate wastewater disposal facilities represented in these scenarios recharges the Edwards Aquifer at rates that are reasonable for this size and capacity of wastewater disposal facility. As expected, the mass load in water recharged to the Edwards Aquifer is dependent on the mass load discharged to the environment, regardless of the wastewater disposal facility type. Modeling of the Base Case and eight scenarios demonstrates that the relative impacts of OSSFs, TLAP Subsurface Area Drip Dispersal Systems (SADDS), TLAP Surface Spray/Irrigation systems (SS), and TPDES practices vary depending on disposal type, mass loading, and location of the facilities. The scenarios with greatest impact on cumulative mass load to recharge of the Edwards

Aquifer were the large, northern TLAP SS facility and the TPDES facility located in the southern portion of the Helotes Creek watershed. Model simulations illustrated that all scenarios, with the exception of the modest-sized TLAP SADDS, resulted in higher cumulative mass loading to the water recharged to the Edwards Aquifer relative to the Base Case indicating that in cases of failure of OSSF systems or increased development requiring a TLAP or TPDES, increased impacts to the quality of recharge to the Edwards Aquifer are to be expected. Transport simulations support the argument that if either a TLAP or TPDES facility were to be installed in the Helotes Creek watershed and that the cumulative amount of wastewater disposed was substantially increased, the trophic state of Helotes Creek would be further degraded and likely classified as mesotrophic or fully eutrophic. Although eight scenarios were considered in the current project, evaluation of additional scenarios could provide further insight into the impact from other possible wastewater disposal facility types, locations, or number of units. Now that a transport/flow model assembly is developed and available, it would be informative to apply the model to the Edwards Aquifer contributing and recharge zones outside of Bexar County experiencing similar development pressures. Having the ability to quantitatively calculate the impact of wastewater disposal facilities in terms of mass loading on rivers and streams would greatly enhance the ability of the: 1) City of San Antonio to measure the impact from protecting lands in the contributing and recharge zones as part of the EAPP; and 2) Texas Commission on Environmental Quality to evaluate the impact of wastewater disposal into rivers and streams in the Edwards Aquifer contributing and recharge zones as part of its permitting processes.

Comparative Evaluation of Wastewater Disposal Practices in the Contributing Zone of the Edwards Aquifer



Prepared for:

City of San Antonio, Parks and Recreation Department,
Edwards Aquifer Protection Program
and
San Antonio River Authority

by:

Mauricio E. Flores, Ronald T. Green, PhD, P.G., Kindra Nicholaides,
Paul Southard, Rebecca Nunu, David Ferrill, PhD, P.G., Gary Walter, PhD,
Stuart Stothoff, PhD, P.G., Nicholas Martin, P.G., P.H.
Southwest Research Institute®
San Antonio, Texas 78238-5166
July 2020

Executive Summary

The City of San Antonio Edwards Aquifer Protection Program (EAPP) was expanded when it was renewed in 2015 to provide funding for research and data acquisition on the Edwards Aquifer. As part of that program, Southwest Research Institute® (SwRI) was chosen to evaluate wastewater disposal in the recharge and contributing zones of the Edwards Aquifer using an integrated hydrologic model. The principal objective of the project was to compare the relative impact that different wastewater disposal facilities would have on the quality of water recharged to the Edwards Aquifer. Wastewater disposal facilities considered as part of the evaluation included on-site sewage facilities (OSSF), Texas Land Application Permit (TLAP), and Texas Pollutant Discharge Elimination Systems (TPDES).

A requirement of the EAPP research and data acquisition program was that funded projects must be located in Bexar County, Texas. Helotes Creek watershed, which is wholly contained in Bexar County, was selected as the study site for the SwRI project. Periphyton and sestonic sampling and analysis indicate that the current trophic state of the Helotes Creek watershed is oligotrophic and possibly slightly mesotrophic which suggests that the stream and watershed have been marginally impacted by wastewater discharges. An objective of the SwRI project is to determine the impact that different wastewater facility types would have on the trophic state of Helotes Creek watershed and the quality of water from the watershed that recharges the Edwards Aquifer.

Currently, OSSFs are the only type of wastewater disposal facility in the Helotes Creek watershed. Analysis of water samples from wells and surface-water bodies provide a measure of how the existing OSSFs have impacted local water quality. Numerical and analytical models were developed to estimate the impact that OSSF, TLAP, or TPDES wastewater facilities would have on water quality in Helotes Creek watershed and the quality of water from the watershed that recharges the Edwards Aquifer.

An integrated hydrologic model of Helotes Creek watershed was developed to generate surface-water/groundwater regimes of the study area. A transport model calculated transport rates and masses for different reservoirs predicated on flows simulated with the integrated hydrologic model. Total nitrogen was designated as the conservative constituent of interest in the transport simulations. These models were used to predict the impact to the quality of water recharged to the Edwards Aquifer from a variety of OSSF scenarios and from hypothetical TLAP and TPDES wastewater facilities in Helotes Creek watershed.

The integrated hydrologic model developed for Helotes Creek watershed incorporated all available information and data for the study site. Nonetheless, during development of the model, it became apparent that this information and data were insufficient to develop a robust comprehensive model of the study domain. Although this shortcoming limits the model when attempting to make detailed, high-resolution predictions of flow and transport in the Helotes Creek watershed, the model is shown to be useful and defensible when making comparative assessments in which the foundational conceptualizations are the same for the cases being compared.

A Base Case model was constructed to replicate, to the degree possible, mass loading from OSSFs currently present in Helotes Creek watershed. Mass loading for the Base Case was calculated using the transport model predicated on flows generated using the integrated hydrologic model. Mass loadings from eight alternative scenarios were then calculated using the same modeling assembly to evaluate the anticipated impact that various OSSF operational performances, a TPDES, and four different TLAP facilities within the Helotes Creek watershed would have on the quality of water recharged to the Edwards Aquifer.

Two locations in the watershed were considered for the location of the TLAPs, one in the less-developed upgradient northern portion of the watershed and one in the more-developed southern portion. The TPDES was placed in the southern portion of Helotes Creek watershed. OSSFs in the model were removed from the area proximal to the hypothetical wastewater disposal facilities. Mass loading from each TLAP system was predicated on the size of the land available at each site, 32 acres at the northern location and 13 acres at the southern location. Volumetric wastewater volumes discharged in the one TPDES and the four TLAP scenarios varied from 0.05 to 0.86 million gallons per day (MGD). Similarly, nitrogen loadings varied from 33.2 to 99.2 kg/d. Mass loadings assigned to the TLAP and TPDES facilities are consistent with comparably-sized facilities in Texas. Due to its greater acreage, mass loading disposal at the northern TLAP location (32 acres) was greater than loading at the southern location (13 acres), hence mass loading to recharge of the Edwards Aquifer was greater for scenarios that represented facilities at the northern location.

The size and capacity of the hypothesized wastewater facilities in the TLAP and TPDES scenarios were reasonable and consistent with possible residential development in the study area. Capacity of the TPDES and TLAP facilities was sufficient for upwards of 4,800 homes covering almost 1,800 acres. Residential developments of this size are conceivable within the 15,640 acres of the Helotes Creek watershed. Accordingly, the nitrogen mass load from the candidate wastewater disposal facilities represented in

these scenarios recharges the Edwards Aquifer at rates that are reasonable for this size and capacity of wastewater disposal facility.

As expected, the mass load in water recharged to the Edwards Aquifer is dependent on the mass load discharged to the environment, regardless of the wastewater disposal facility type. Modeling of the Base Case and eight scenarios demonstrates that the relative impacts of OSSFs, TLAP Subsurface Area Drip Dispersal Systems (SADDS), TLAP Surface Spray/Irrigation systems (SS), and TPDES practices vary depending on disposal type, mass loading, and location of the facilities. The scenarios with greatest impact on cumulative mass load to recharge of the Edwards Aquifer were the large, northern TLAP SS facility and the TPDES facility located in the southern portion of the Helotes Creek watershed. Model simulations illustrated that all scenarios, with the exception of the modest-sized TLAP SADDS, resulted in higher cumulative mass loading to the water recharged to the Edwards Aquifer relative to the Base Case indicating that in cases of failure of OSSF systems or increased development requiring a TLAP or TPDES, increased impacts to the quality of recharge to the Edwards Aquifer are to be expected.

Transport simulations support the argument that if either a TLAP or TPDES facility were to be installed in the Helotes Creek watershed and that the cumulative amount of wastewater disposed was substantially increased, the trophic state of Helotes Creek would be further degraded and likely classified as mesotrophic or fully eutrophic. Although eight scenarios were considered in the current project, evaluation of additional scenarios could provide further insight into the impact from other possible wastewater disposal facility types, locations, or number of units. Now that a transport/flow model assembly is developed and available, it would be informative to apply the model to the Edwards Aquifer contributing and recharge zones outside of Bexar County experiencing similar development pressures. Having the ability to quantitatively calculate the impact of wastewater disposal facilities in terms of mass loading on rivers and streams would greatly enhance the ability of the: 1) City of San Antonio to measure the impact from protecting lands in the contributing and recharge zones as part of the EAPP; and 2) Texas Commission on Environmental Quality to evaluate the impact of wastewater disposal into rivers and streams in the Edwards Aquifer contributing and recharge zones as part of its permitting processes.

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1 Introduction

The Edwards Aquifer supplies water to over 2 million people and serves as the City of San Antonio's primary source of water. Given the aquifer's critical importance to human and environmental health and economic viability, the Edwards Aquifer Protection Program (EAPP) was created to study, protect, and improve water quality in the recharge and contributing zones of the San Antonio segment of the Edwards Aquifer. The EAPP was established in 2000 after voters approved the allocation of an 1/8 cent of the sales tax to purchase lands and conservation easements to protect recharge to the Edwards Aquifer with the goal of stemming development in these sensitive areas. This program became quite popular and was approved again in 2005, 2010, and 2015. As part of the program approved in 2015, $10 million was designated to fund research and collect data to help achieve the program's goals. The EAPP is managed and administered by the City of San Antonio, and the San Antonio River Authority (SARA) is the contracted administrator of the water quality projects component funding this study.

Southwest Research Institute (SwRI) was granted funding to study the impacts of different wastewater disposal methods on the Edwards Aquifer water quality within Bexar County. This report provides a summary of the findings and work completed as part of this EAPP-funded project.

1.1 Problem Statement and Scope

There are three main types of wastewater disposal facilities used in Texas (**Figure 1-1**): 1) On-Site Sewage Facilities (OSSFs), such as septic systems, 2) Texas Land Application Permit (TLAP) facilities, which distribute treated effluent via subsurface drip disposal or surface irrigation, and 3) Texas Pollutant Discharge Elimination Systems (TPDES), which are facilities in which effluent from treatment plants is permitted to be disposed into waterways. The goal of this project is to examine and compare impacts to the quality of water that is, or could hypothetically be, introduced to the Edwards Aquifer from each type of wastewater disposal facility.

A requirement of the EAPP research and data acquisition program was that funded projects must be located in Bexar, Texas. Helotes Creek watershed, which is wholly contained in Bexar County, was selected as the study site for the SwRI project (**Figure 1-2**). Currently, this region of Bexar County is a residential, suburban community and all

wastewater disposal in the watershed is handled using OSSFs. Impact to the San Antonio segment of the Edwards Aquifer from wastewater disposal in the Helotes Creek watershed is examined for existing conditions as well as for eight hypothetical scenarios. These scenarios assess the impact of future development in the watershed as well as that of hypothetical unpermitted facilities, current malfunctioning facilities, and possible alternative wastewater disposal facilities such as TPDES and TLAP facilities.

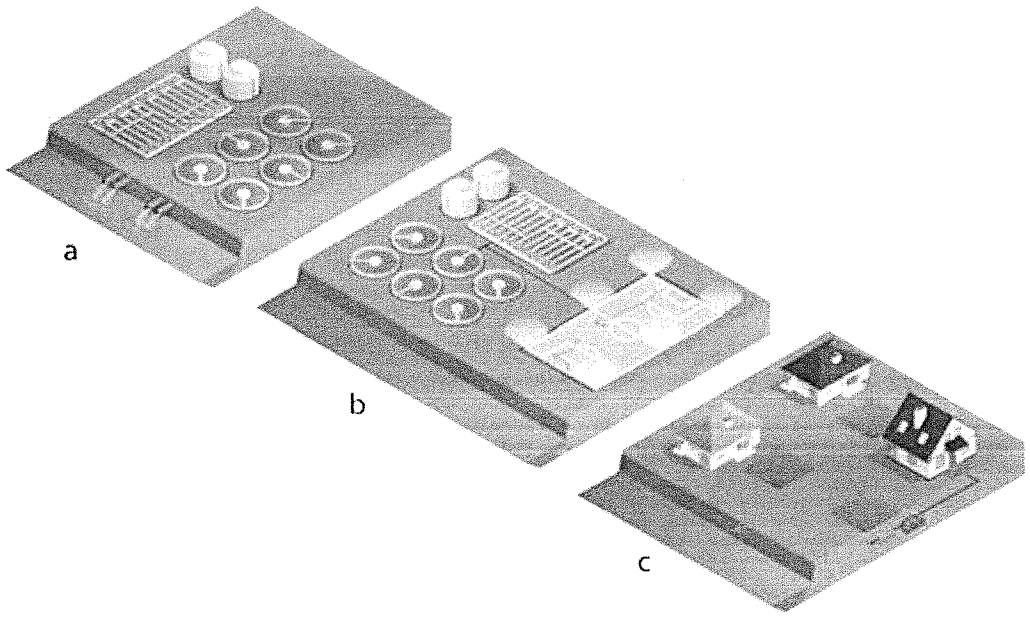

Figure 1-1 The three main types of wastewater disposal facilities in Texas: a) Texas Pollutant Discharge Elimination System (TPDES), b) Texas Land Application Permit (TLAP), and c) On-Site Sewage Facilities (OSSFs).

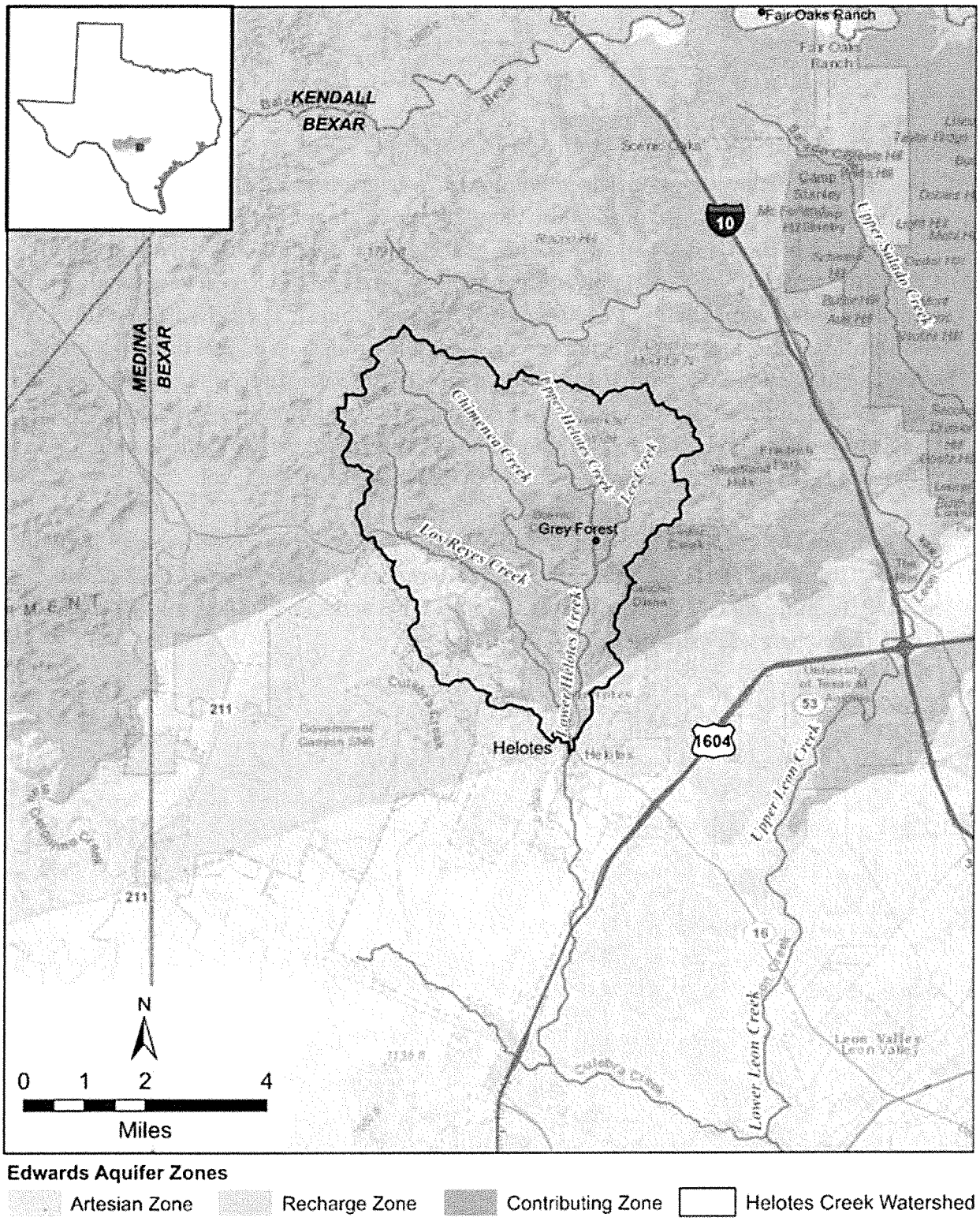

Figure 1-2 Helotes Creek watershed and the Edwards Aquifer in northwest Bexar County.

2 Study Area

2.1 Description of Helotes Creek watershed

The Helotes Creek watershed is located in northwestern Bexar County within the contributing and recharge zones of the San Antonio Segment of the Edwards Aquifer. It forms part of the Leon Creek watershed of the greater Medina River watershed (HUC 12100301), which is, in turn, a part of the northern San Antonio River watershed. The total area of the watershed is 15,680 acres (24.5 square miles). The Edwards Aquifer contributing zone comprises 13,696 acres (21.4 square miles) or 87.2 % of the Helotes Creek watershed (12.8% of the contributing zone of the San Antonio segment). The Edwards Aquifer recharge zone covers 1,984 acres (3.1 square miles) or 12.8% of the Helotes Creek watershed (0.26% of the recharge zone of the San Antonio segment) (**Figure 1-2**). The elevation ranges from 300 to 549 feet above sea level.

The watershed consists of five subwatersheds: Los Reyes Creek (5,888 acres (9.2 square miles)), Chimenea Creek (4,160 acres/6.5 square miles), Upper Helotes Creek (2,240 acres (3.5 square miles)), Lower Helotes Creek (1,536 acres (2.4 square miles)), and Lee Creek (5,760 acres (2.9 square miles)) (**Figure 2-1**).

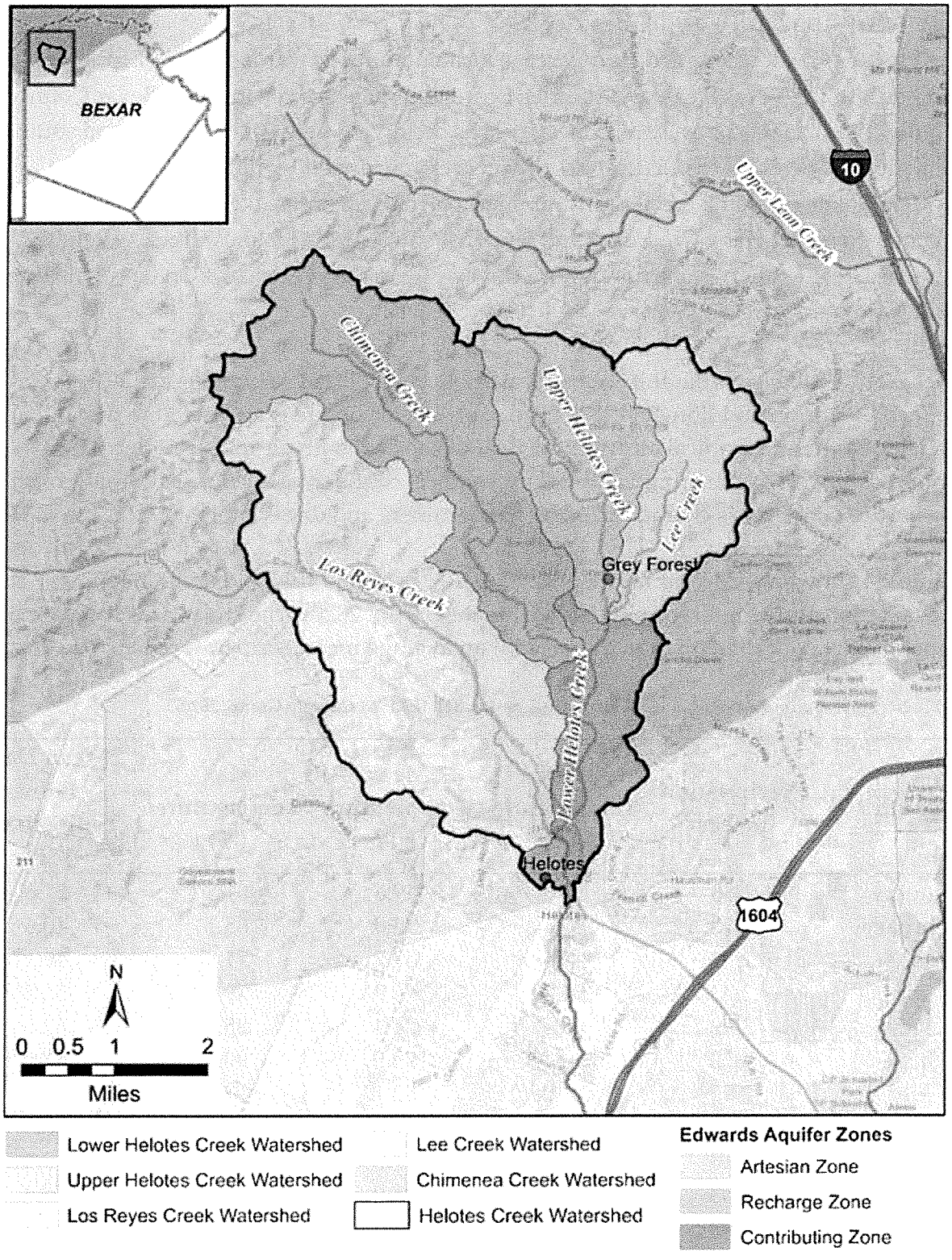

Figure 2-1 Subwatersheds within the Helotes Creek watershed.

2.2 Physiography and Climate

The Helotes Creek watershed study area is located in the Edwards Plateau Ecoregion, just north of the Texas Blackland Prairies Ecoregion which covers most of Bexar County (**Figure 2-2**). The Balcones Fault Zone serves as the divide between the north and south ecoregions. The Edwards Plateau Ecoregion is characterized by hilly, limestone dissected plateaus, karst topography, and juniper-oak savanna and mesquite-oak savanna. South of Haby Crossing Fault, and just south of the Helotes Creek watershed, the soils become finer grained and more clayey due to the presence of Cretaceous shale, chalk, and marl parent materials.

The watershed falls within the Subtropical Subhumid Climate Zone (**Figure 2-3**) as defined by Larkin and Bomar (1983). The subtropical climate is attributed to the transport of humid tropical air from the Gulf of Mexico, with air moisture decreasing from east to west as the humid tropical air contacts continental air masses coming from the north. This zone is characterized by hot summers and dry winters.

Table 2-1 shows the 30-year normals (1981-2010), both monthly and annual, for precipitation and temperature (PRISM Climate Group, 2020). The study area receives about 34 inches of precipitation a year with an average mean temperature of 67 °F.

Table 2-1 30-year climate averages in Helotes Creek watershed (PRISM Climate Group, 2020).

Month	Precipitation (inches)	Min Temperature (°F)	Mean Temperature (°F)	Max Temperature (°F)	Mean Dew Point Temperature (°F)
January	1.86	37.9	49.6	61.3	37.6
February	2.10	40.8	53.0	65.1	40.6
March	2.76	47.6	59.7	71.8	46.1
April	2.23	54.7	66.9	79.1	52.8
May	3.99	63.5	74.4	85.2	62.5
June	4.22	69.1	79.8	90.6	67.2
July	2.95	71.0	82.1	93.2	67.3
August	2.17	70.9	82.8	94.7	66.3
September	3.18	65.8	77.5	89.3	63.4
October	4.03	57.0	68.9	80.9	56.3
November	2.43	47.4	59.2	70.9	47.4
December	2.11	38.8	50.5	62.1	39.2
Annual	**34.03**	**55.4**	**67**	**78.7**	**53.9**

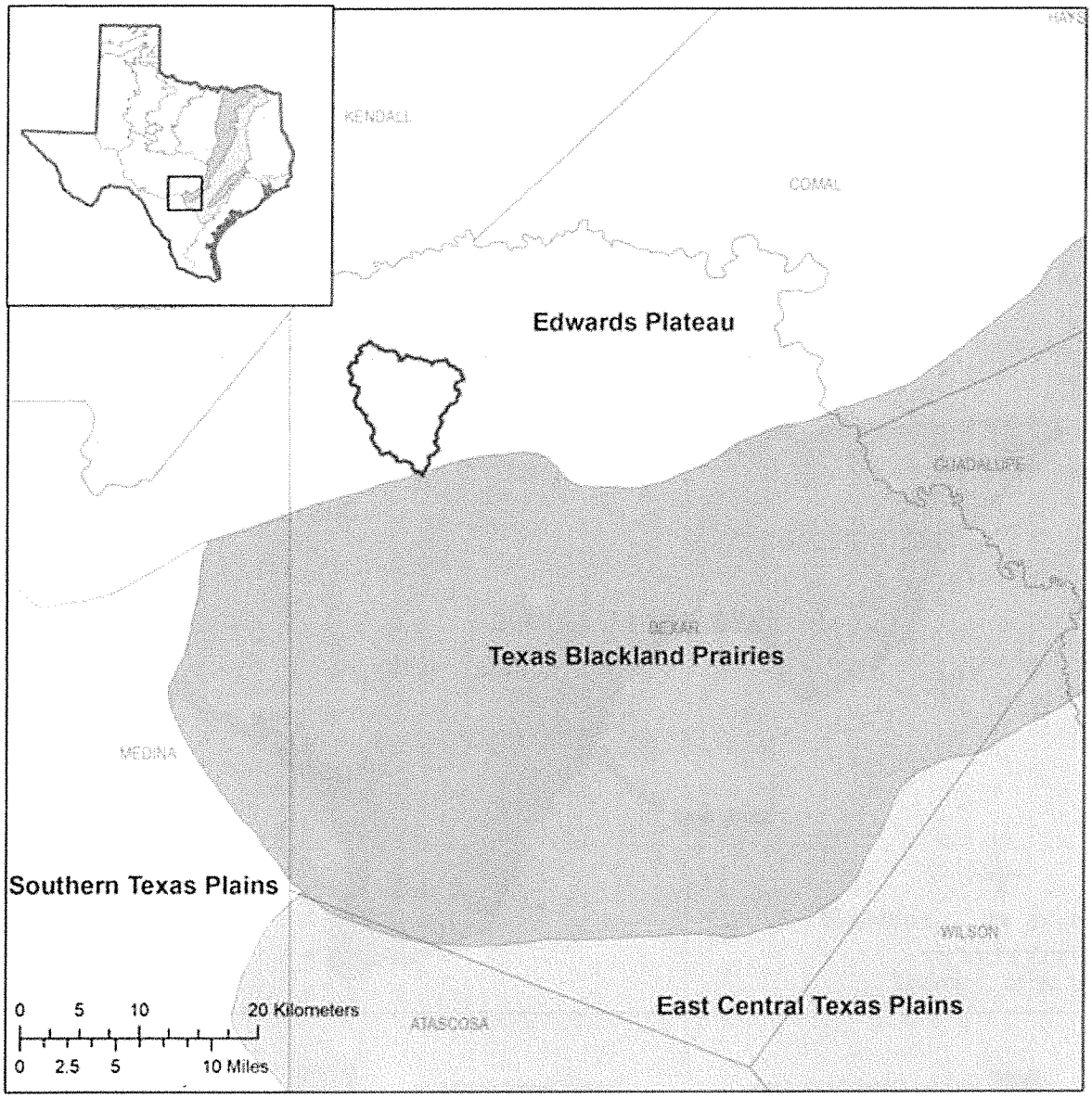

Figure 2-2 Ecoregions in Bexar County.

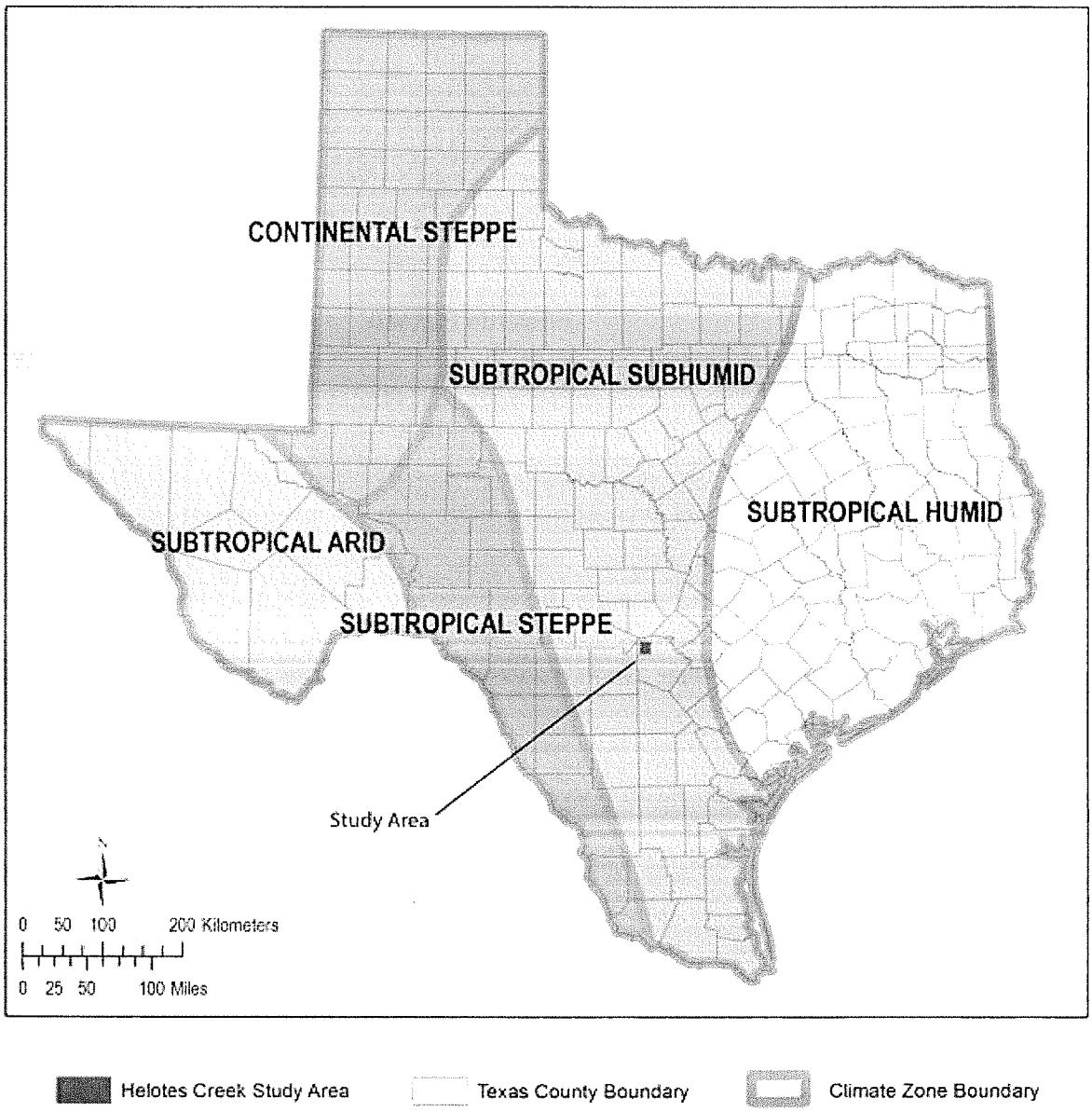

Figure 2-3 Texas climate zones from Larkin and Bomar (1983).

2.3 Hydrogeology

2.3.1 Hydrostratigraphy

Hydrostratigraphy of the study domain is dominated by the Edwards and Trinity aquifers, although younger hydrostratigraphic units are present to the south and outside of the area of focus. The Edwards and Trinity aquifers are karst aquifers consisting of lower Cretaceous limestone (Sharp, Green, & Schindel, 2019). The Trinity Aquifer is divided into lower, middle, and upper units based on lithology and hydraulic properties (Ashworth, 1983). The lower Trinity Aquifer includes the Sligo, Hosston, and Hammett Shale formations. The middle Trinity Aquifer includes the Cow Creek Limestone, Hensell Sand, and Lower Glen Rose Limestone. The upper Trinity Aquifer includes the Upper Glen Rose Limestone. The Edwards Aquifer overlies the Trinity Aquifer and comprises the Kainer, Person, and Georgetown formations.

Lithologic descriptions, water-bearing function, and thicknesses of hydrostratigraphic units (HSU) that comprise the Edwards and Trinity aquifers are provided in **Table 2-2**. From top to bottom, Maclay and Small (1976) delineated eight different hydrostratigraphic units (HSU) within the Georgetown (HSU I), Person (HSU II-IV), and Kainer (HSU V-VIII) formations of the Edwards Aquifer. Hydrostratigraphic units were defined based on lithologic characteristics (color, composition, texture) and hydrologic function. Highly permeable intervals are variably distributed throughout units II, III, and VI, with the most permeable parts of these units in honeycombed rock (Maclay, 1995; Lindgren et al., 2004). Groschen (1996) indicated that units III, VI, and VII transmit most of the ground water within the San Antonio region, although, highly permeable dissolution features are observed in all of the hydrostratigraphic units. Interaction between lithologies and structure has been observed to influence distribution of karst conduits (Hovorka et al., 1998). Ferrill and Morris (2003) and Ferrill et al. (2019) describe that lithology and structure interactions include refraction of normal faults controlled by failure angle differences between different mechanical layers. In such cases, more competent beds contain steeper normal faults segments that dilate during fault slip and subsequently localize groundwater flow and associated dissolution.

The Georgetown Formation (HSU I), which is included as the uppermost part of the Edwards Aquifer, is classified as a confining layer (Maclay & Small, 1976). Within the underlying Person Formation are the cyclic and marine member (HSU II) and the leached and collapsed member (HSU III), which are both classified as aquifers, and the underlying regional dense member (HSU IV), which is considered a confining unit. Within the underlying Kainer Formation, the grainstone (HSU V), Kirschberg evaporite (HSU VI), dolomitic (HSU-VII), and basal nodular members (HSU VIII) are classified as

aquifers, although the basal nodular member may be a confining unit at localities where caves are absent.

Clark et al. (2016) subdivided the Trinity Aquifer into informal hydrostratigraphic units that crop out in northern Bexar and Comal counties (**Table 2-2**). The upper Trinity Aquifer – the Upper Glen Rose Limestone – is subdivided into six informal HSUs (ordered from top to bottom): cavernous, Camp Bullis, upper evaporite, fossiliferous (upper and lower), and lower evaporite. The middle Trinity Aquifer – the Lower Glen Rose Limestone – is informally subdivided into six HSUs (ordered from top to bottom): Bulverde, Little Blanco, Twin Sisters, Doeppenschmidt, Rust, and Honey Creek HSUs. The middle Trinity aquifer comprises the Hensell Sand, Cow Creek Limestone, and the Hammett Shale of the Pearsall Formation. The Hammett Shale is designated as the confining unit at the base of the model. The outcrop pattern of HSUs in the study area is illustrated in **Figure 2-4**, from the geologic framework model.

The cavernous, upper evaporite, the upper fossiliferous, and lower evaporite HSUs are considered as aquifers in the Upper Glen Rose Formation, whereas the Camp Bullis and lower fossiliferous HSUs are considered confining units. Within the Lower Glen Rose Formation, the Little Blanco, Doeppenschmidt, and Honey Creek HSUs are considered aquifers and the Bulverde, Twin Sisters, and Rust HSUs act as semi-confining layers. At the base of the middle Trinity Aquifer, the Hensell Sand HSU is considered as either an aquifer or a confining layer and the Cow Creek HSU is an aquifer. Lastly, the Hammett Shale HSU in the upper part of the lower Trinity Aquifer is a confining layer.

2.3.2 Geologic framework and structural controls

The Cretaceous Edwards and Trinity aquifer strata underwent regional-scale normal faulting during the Miocene epoch to form the Balcones Fault Zone (Hill & Vaughan, 1898; Weeks, 1945). The Balcones Fault Zone is the primary structural feature in the Edwards-Trinity Aquifer system and comprises a series of downthrown blocks that trend northeast to southwest within the study area. Its surface expression produces the Balcones Escarpment, a physiographic feature that separates the Edwards Plateau from the Gulf Coastal Plains.

Geologic structures, namely faults and fractures, can act as either barriers or conduits to flow depending on the associated porosity, cementation, and other deformation characteristics (e.g., clay smear). The permeability architecture of the aquifer system, described by Ferrill et al. (2005; 2010; 2019), is strongly controlled by geologic structures in three ways: (i) faults juxtapose permeable and impermeable units, (ii) structural thinning of aquifer strata, and (iii) faults create pathways, both laterally and vertically, for groundwater movement. These controls dictate how geologic structure influences

groundwater flow. This study primarily relied upon the fault mapping of Clark et al. (2016), and implemented this structural control for the geologic framework and groundwater model. Clark et al. (2016) built on previous fault mapping in the region by Collins and Hovorka (Map No.18, 1997) and Collins (2000), among others. As described in **Section 2.3.3**, the fault displacements incorporated in the model are internally consistent with refined HSUs within the study domain.

Geologic structure strongly influences the hydrogeology of the study area. This geologic structure is dominated by normal faults of the Balcones Fault Zone, including the offset and juxtaposition of hydrostratigraphic units associated with these faults (Collins & Hovorka, 1997; Ferrill et al., 2004; Ferrill & Morris, 2008; Clark et al., 2016; Ferrill et al., 2019b). The faults typically have dips of 60 degrees or greater, depending upon the stratigraphic unit (Ferrill & Morris, 2008). The Haby Crossing Fault is the largest fault in the study domain in terms of displacement. Southwest of the study domain, the fault has a maximum throw of about 178 m (584 ft) and juxtaposes virtually the entire Edwards Aquifer stratigraphic section with rocks of the Glen Rose Formation (Ferrill et al, 2005).

Within the Helotes Creek watershed, the large offset north of Haby Crossing Fault has resulted in the removal of all Edwards units in the creek channel. The uppermost unit in the Trinity Aquifer, the Cavernous unit, is the unit exposed throughout most of the downstream portion of the Helotes Creek watershed (**Figure 2-4**). Remnants of the Edwards units north of Haby Crossing Fault are restricted to upland areas as evidenced by Edwards rocks only present as capping the Trinity units in the northern portion of the watershed. The Edwards units are above the water table and essentially dewatered with the possible exception of minor perching.

Multiple investigations support the interpretation that the upper 120-150 feet of the Trinity Aquifer is hydraulically connected with the lower Edwards Aquifer (Veni, 1994; Gary et al., 2011; Green et al., 2011). This portion of the Trinity Aquifer is referred to as Internal A (Veni, 1994). Hence, even though Edwards units are absent in Helotes Creek watershed north of Haby Crossing Fault, the Trinity Aquifer Cavernous unit is in hydraulic communication with the Edwards Aquifer.

The oddly shaped exposure of the Edwards units in the Helotes Creek watershed immediately south of Haby Crossing Fault is not natural (**Figure 2-1**). This exposure of the Edwards Aquifer is due to the removal of the overlying Del Rio Clay as part of mining operations at the Martin Marietta limestone quarry at this location. By virtue of the fact that this feature is down gradient and outside of the study area renders it non-consequential to this evaluation.

Groundwater flow within the central portion of the study domain and upgradient (northwest) from Haby Crossing Fault is influenced by relay-ramp structures. Relay ramps are geological structures that form as tilted panels of rock that transfer displacement between two overlapping sub-parallel (en echelon) faults (Twiss & Moores, 1992). Relay ramps themselves may provide lateral continuity and unbroken fluid pathways with aquifers from aquifer recharge areas into the artesian zone and within the artesian zones (Collins & Hovorka, 1997; Ferrill & Morris, 2001; Hunt, et al., 2015). Within a relay ramp, subsidiary normal faults and extension fractures commonly form that are oblique to the bounding faults and can influence groundwater movement (Grimshaw & Woodruff Jr., 1986; Collins & Hovorka, 1997; Ferrill & Morris, 2001). Fault zones themselves can also produce conduits or barriers to groundwater flow in the Trinity and Edwards aquifers (e.g. Maclay, 1995; Ferrill, et al., 2008); Ferrillet al., 2019b). This conduit versus barrier behavior is strongly influenced by lithology and mechanical character of rock layers during deformation, and the related deformation mechanisms, as well as the amount of displacement on the fault (e.g. Ferrill & Morris, 2008; Ferrill & Morris, 2003; Ferrill et al., 2019b). In the present study, because of the size of the model domain and lack of local control on fault zone permeability, specific permeability traits are not attributed to the faults. Instead, faults in the model simply represent surfaces across which hydrostratigraphic units are offset and juxtaposed with other units.

2.3.3 Interformational flow of the Edwards and Trinity aquifers

Informal subdivisions of HSUs, faults, and structural controls on groundwater movement offer better constraint on potential interformational flow between the Edwards and Trinity aquifers in the study area. The informal HSUs delineated by Clark et al. (2016) highlight transmissive HSUs (i.e., upper Person and Kainer of the Edwards Aquifer; cavernous, evaporite, and Honey Creek of the Trinity Aquifer) that are susceptible to lateral communication of juxtaposed transmissive units.

The Haby Crossing Fault is conceptualized to be the primary structural feature that allows interformational flow between the Edwards and Trinity aquifers in the study area (**Figure 2-5** and **Figure 2-6**). Throw of approximately 82 feet in the east and 492 feet in the west on the Haby Crossing Fault in the study area is sufficient to juxtapose permeable Edwards aquifer HSUs in the hanging wall of the fault against permeable HSUs of the Trinity Aquifer on the footwall of the fault. Specifically, the fault juxtaposes the cavernous HSU of the Trinity Aquifer on the upthrown side of the fault with the water-bearing HSUs in the Person and Kainer formations of the Edwards Aquifer on the downthrown side of the fault (**Figure 2-7**and **Figure 2-8**). Past work has shown that the Haby Crossing Fault and similar faults do not act as barriers to flow, but instead allow hydraulic communication and interaquifer groundwater flow paths

across fault planes (Ferrill et al., 2005; Ferrill, et al., 2008; Johnsonet al., 2010; Saribudak & Hawkins, 2019). Previous studies suggest 60-100% of faulted Trinity units are in contact with the water-bearing HSUs in the Person and Kainer formations of the Edwards Aquifer along the Haby Crossing Fault (Ferrill et al., 2005).

The exact nature of the hydraulic relationship and interformational flow between the Edwards and Trinity aquifers at and downgradient from Haby Crossing Fault is therefore not well constrained. Uncertainty arises due to the fact that water that recharges the Cavernous unit north of Haby Crossing Fault may or may not pass through additional Trinity Aquifer units before arriving at the Edwards Aquifer. This flowpath is complicated by the karstic nature of both the Edwards and Trinity aquifers which introduces the potential for both diffuse- and conduit-flow mechanisms. The conceptualization embraced in this evaluation is that Haby Crossing Fault does not act as a barrier to flow and that virtually all water that discharges from the Helotes Creek watershed north of Haby Crossing Fault eventually recharges the Edwards Aquifer in close proximity to the study area. Hence, this conceptual uncertainty has minimal bearing on this evaluation due to the fact that all water discharged from the Helotes Creek watershed is assumed to eventually recharge the Edwards Aquifer.

Table 2-2 Hydrostratigraphic units in the study area.

Group or Formation	Formal and informal member	Hydrostratigraphic unit (HSU)	Map abbreviation	Description	Hydrologic function	Relative thickness (ft)	Model HSU
Taylor Group (Pecan Gap)		Upper Confining Units (UCU)	Kpg	Marl, calcareous clay, blue in the subsurface weathers greenish yellow	Confining		--
Austin Group			Ka	Massive, chalky, locally marly, mudstone, nodular wackestone, mudstone, nodular bioturbated wackestone	Confining, locally water bearing in cavernous zones	150-160	Austin
Eagle Ford Group			Kef	Brown, flaggy, sandy shale and argillaceous limestone, iron nodules	Confining		
Buda Limestone			Kb	Buff to light gray, dense nodular mudstone and wackestone, calcite-filled veins, bluish dendrites, iron nodules, iron staining	Confining	40-50	Buda
Del Rio Clay			Kdr	Fossiliferous blue-green to yellow-drown clay, packstone, iron nodules	Confining	40-50	Del Rio
Georgetown Formation		I	Kg	Porosity < 5%; dense, shaly limestone; mudstone and wackestone; isolated fossil molds	Confining	20-30	Georgetown
Person Formation	Cyclic and marine, undivided	II	Kpcm	Hard, dense, recrystallized limestone; mudstone; rudistid biomicrite; some moldic porosity	Aquifer	80-90	Upper Person
	Leached and collapsed	III	Kplc	Highest porosity within Person Formation (Maclay and Small, 1976); recrystallized, leached limestone; burrowed mudstone and wackestone; solution breccias	Aquifer	70-90	

Group or Formation	Formal and informal member	Hydrostratigraphic unit (HSU)	Map abbreviation	Description	Hydrologic function	Relative thickness (ft)	Model HSU
	Regional dense member	IV	Kprd	No water produced from this HSU (Maclay & Small, 1976); limestone, shaly to wispy, dense; mudstone; no open fractures	Confining	20-24	Lower Person
Kainer Formation	Grainstone	V	Kkg	Porosity < 10%; chalky to hard cemented miliolid grainstone with associated beds of mudstone and wackestone; locally honeycombed in burrowed beds	Aquifer	40-50	Kainer
	Kirschberg evaporite	VI	Kkke	Limestone and leached evaporitic rocks with boxwork porosity; most porous and permeable subdivision	Aquifer	40-50	
	Dolomitic	VII	Kkd	Porosity 5 – 20%; limestone, recrystallized from dolomite, honeycombed in a few burrowed beds; more cavernous in upper part	Aquifer	90-120	
	Basal nodular	VIII	Kkbn	Limestone, hard, dense; clayey mudstone to wackestone, nodular, wispy, stylolitic, mottled; isolated molds	Aquifer, confining unit in areas without caves	40-50	
Glen Rose Limestone	Upper Glen Rose Limestone	Cavernous	Kgrc	Limited lateral extent, is considered water-bearing and often hydrologically indistinguishable from the Edwards Aquifer; bedding planes, fractures, and caves, which allow meteoric water to infiltrate the Edwards Aquifer through juxtaposed units between the Trinity and Edwards aquifers	Aquifer	0-120	Cavernous

Group or Formation	Formal and informal member	Hydrostratigraphic unit (HSU)	Map abbreviation	Description	Hydrologic function	Relative thickness (ft)	Model HSU
		Camp Bullis	Kgrcb	Generally confining, although perched groundwater on less soluble beds transmitted laterally through caves and conduits	Confining	120-230	Camp Bullis
		Upper evaporite	Kgrue	Water bearing but not laterally continuous; diverts groundwater to discharge at springs and seeps (Clark, 2004; Clark et al., 2009)	Aquifer	88-210	Evaporite
		Upper Fossiliferous	Kgruf	Distinct from one another where biostrome exists between them; Kgrlf generally behaves as a confining unit, upper has numerous caves that enable groundwater transport over large distances.	Aquifer	0-40	
		Lower Fossiliferous	Kgrf / Kgrlf		Confining	80-150	
		Lower evaporite	Kgrle	Characteristically similar to Kgrue in water bearing function and contribution to spring discharge and seeps	Aquifer	8-10	
	Lower Glen Rose Limestone	Bulverde	Kgrb	Semi-confining unit; water restricted to move laterally to springs and seeps by shale bed at top of unit	Semi-confining	30-40	Lower Glen Rose
		Little Blanco	Kgrlb	Interconnected porosity enables water-bearing unit to transmit water through caves and underground streams	Aquifer	30-40	
		Twin Sisters	Kgrts	Semi-confining unit; water restricted to move laterally to springs and seeps along hillsides by shale beds	Semi-confining	10-66	
		Doeppenschmidt	Kgrd	Characterized by bedding plane,	Aquifer	40-80	

Group or Formation	Formal and informal member	Hydrostratigraphic unit (HSU)	Map abbreviation	Description	Hydrologic function	Relative thickness (ft)	Model HSU
				fracture, and cave porosity			
		Rust	Kgrr	Semi-confining in areas without faulting; near faults, characterized by caves (often linked to cave formation in the overlying Doeppenschmidt) and conduit porosity	Semi-confining	40-70	
		Honey Creek	Kgrhc	Transmissivity most characteristic of the lower half of this HSU; karstic features development favored by preceding biogenic porosity	Aquifer	45-60	Honey Creek
Pearsall Formation	Hensell Sand	Hensell	Kheh	Water-bearing in the northwest and grades into the lower member of the Glen Rose Limestone to the south becoming dolomitic and confining	Aquifer and confining	0-61	Hensell
	Cow Creek Limestone	Cow Creek	Kcccc	Very fine to fine-grained carbonate sand (grainstone) with localized crossbedding; recharged by losing streams where surface expression exists, and interformational flow with Hensell HSU; primary source of water production from the Middle Trinity Aquifer	Aquifer	40-72	--
	Hammett Shale	Hammett	Khah	Does not crop out in study area; Upper: claystone, with siltstone lenses, overlain by fossiliferous dolomitic limestone Lower: siltstone and dolomitic limestone	Confining	50	--

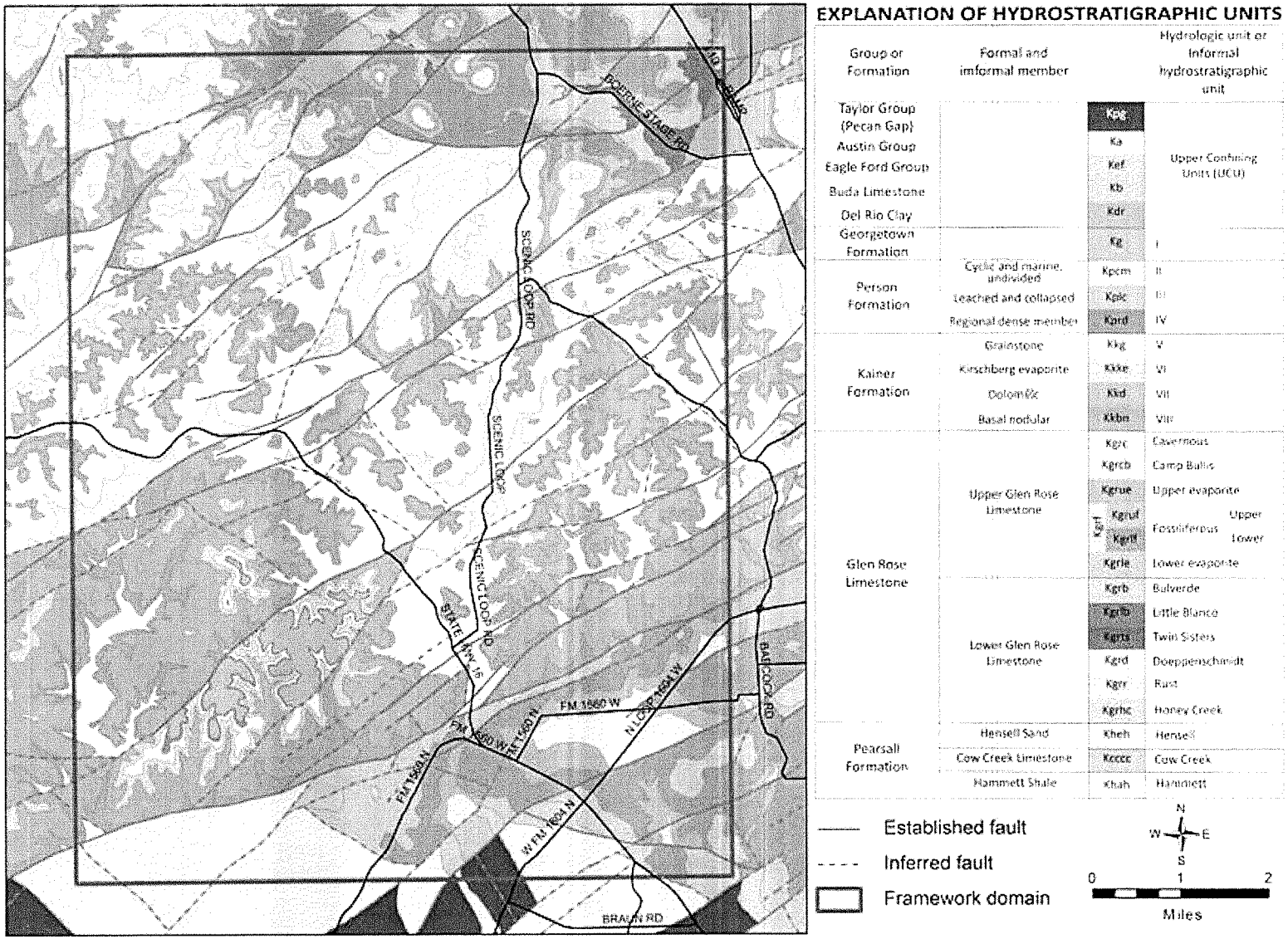

Figure 2-4 Outcrop geology and faults in the study area (modified from Clark et al., 2016).

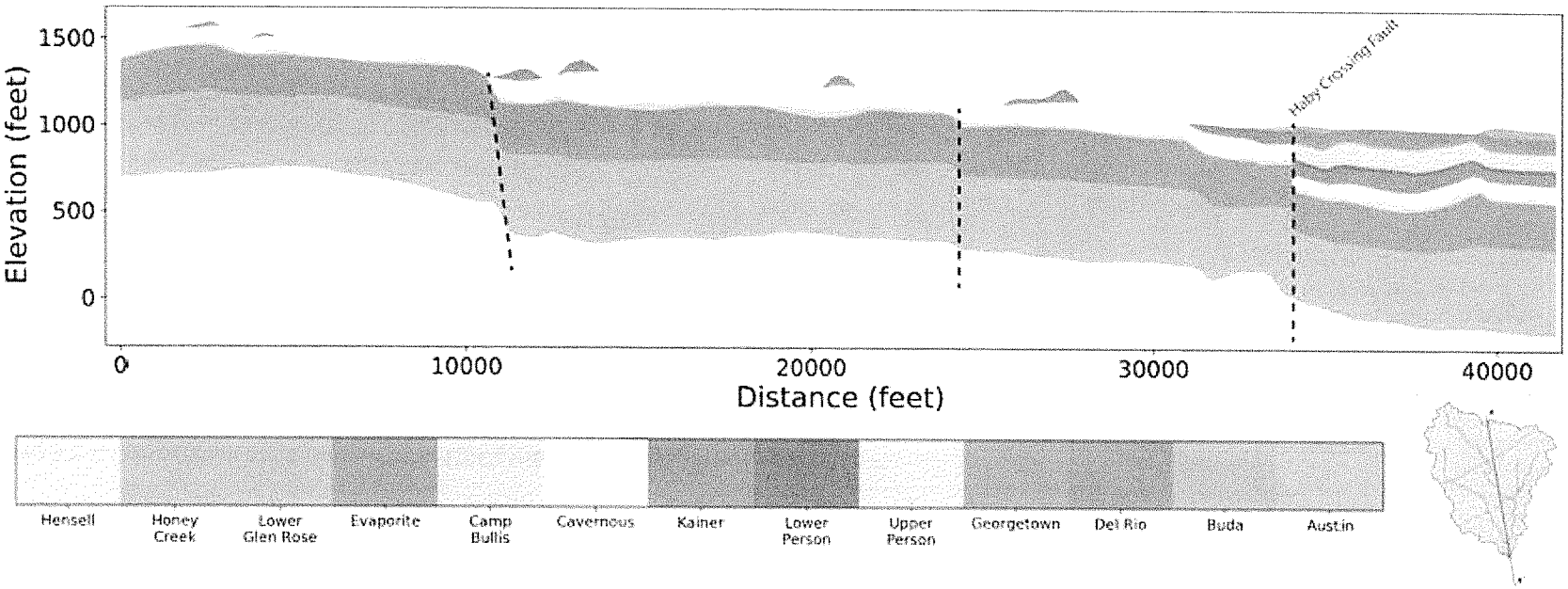

Figure 2-5 Cross section of HSUs within the Helotes Creek watershed. Vertical exaggeration = 5×.

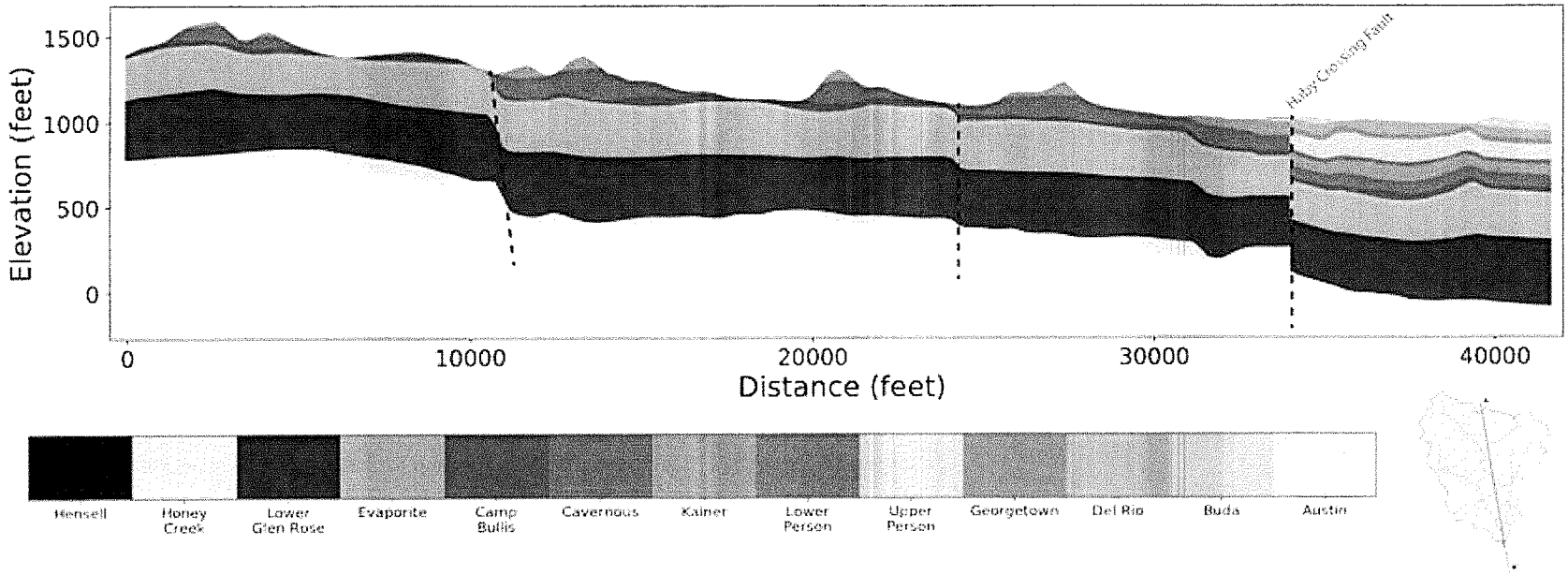

Figure 2-6 Cross section of transmissivity of HSUs within the Helotes Creek watershed.

Variations of gray and black represent low transmissivity, whereas shades of blue represent transmissive units of the Edwards Aquifer and shade of green represent transmissive units of the Trinity Aquifer. Vertical exaggeration = 5×.

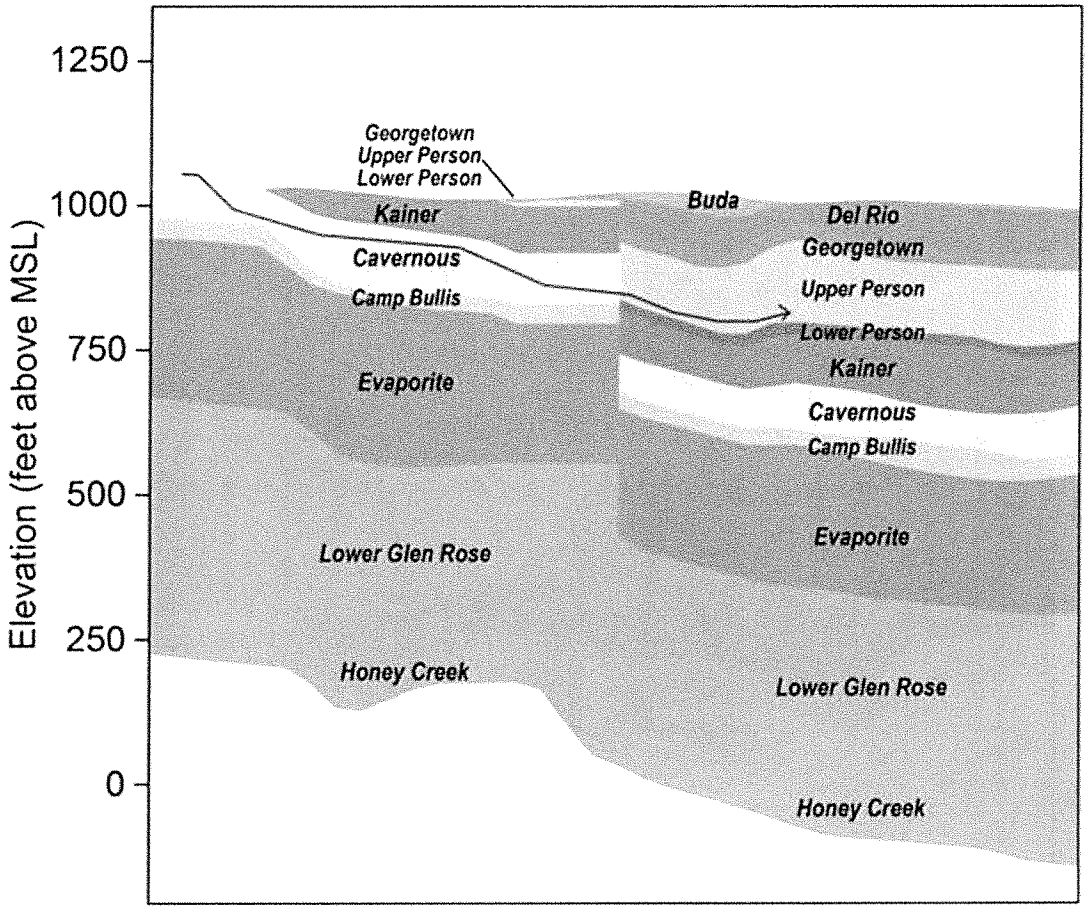

Figure 2-7 Juxtaposition of Edwards and Trinity hydrostratigraphic units along the Haby Crossing Fault from the cross section in Figure 2-5. Fault displacement is approximately 200 feet.

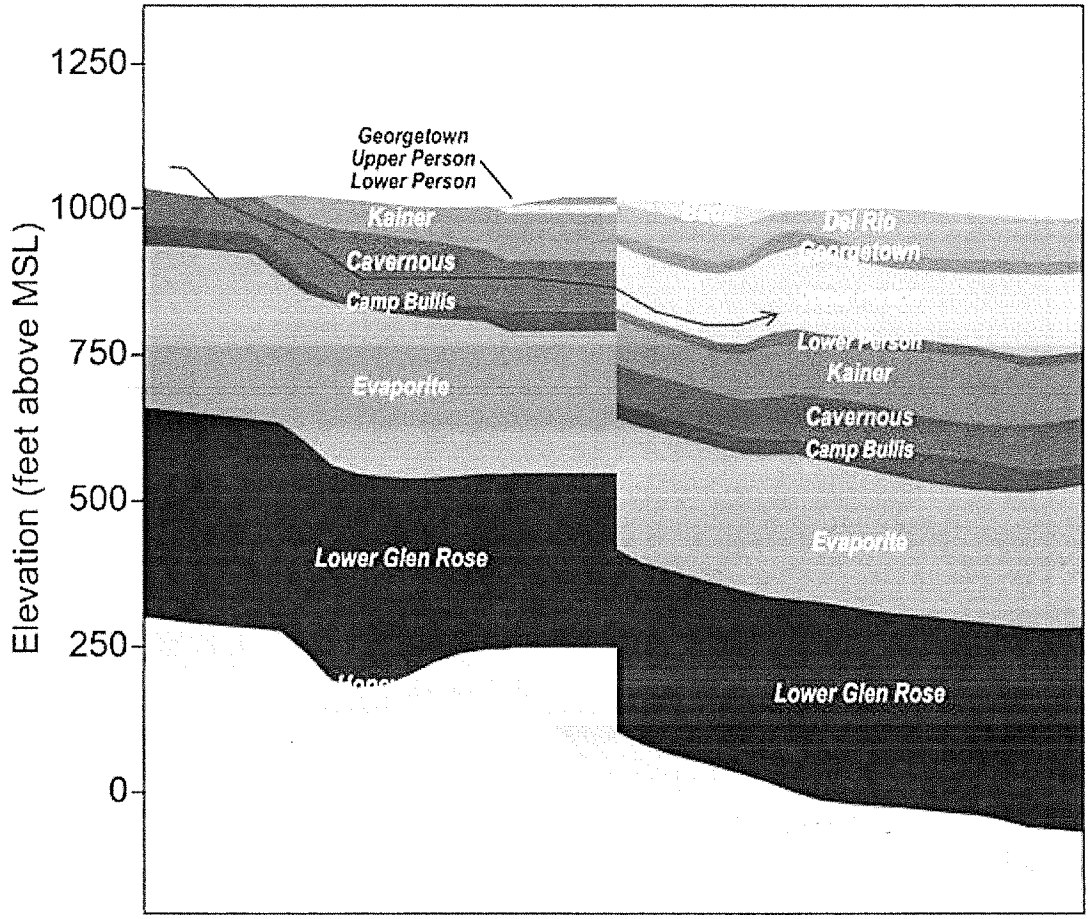

Figure 2-8 Juxtaposition of Edwards and Trinity transmissive units along the Haby Crossing Fault from the cross section in Figure 2-6. Fault displacement is approximately 200 feet.

2.4 Development

The Helotes Creek watershed includes the City of Grey Forest as well as part of the City of Helotes (**Figure 2-9**). In the 1800s, the area was a farming community consisting primarily of ranches, some of which in the northern portion of the watershed remain intact. The opening of the John T. Floore County Store in 1946 marked the start of commercial and economic growth in the area (Helotes, 2020).

This region is considered the fastest growing in Bexar County. The population of Helotes has grown from 1,535 in 1990 to 7,341 in 2010 according to the US Decennial Census. It currently is estimated to be home to 9,567 residents. Grey Forest currently has a population of about 500 residents (Grey Forest, 2020).

The Helotes City Master Plan (2009) encourages nodal type growth, or development in select places rather than sprawling strip mall style development. While impervious cover in the nodes may reach up to 70%, the overall percent of impervious cover will remain low. Densified "nodal" development areas are intended to decrease the overall impact on the environment and watershed (Helotes Planning and Zoning Commission, 2009).

Data from Bexar County Appraisal District (BCAD) illustrates the increase in development in the watershed. **Figure 2-10** shows yearly increase in residential development according to date of house construction. The plot shows the cumulative number of houses that has been built from 1840 to 2018. Exponential growth in the number of residences reflects the increase in population, which has been accompanied by commercial and economic development in the area.

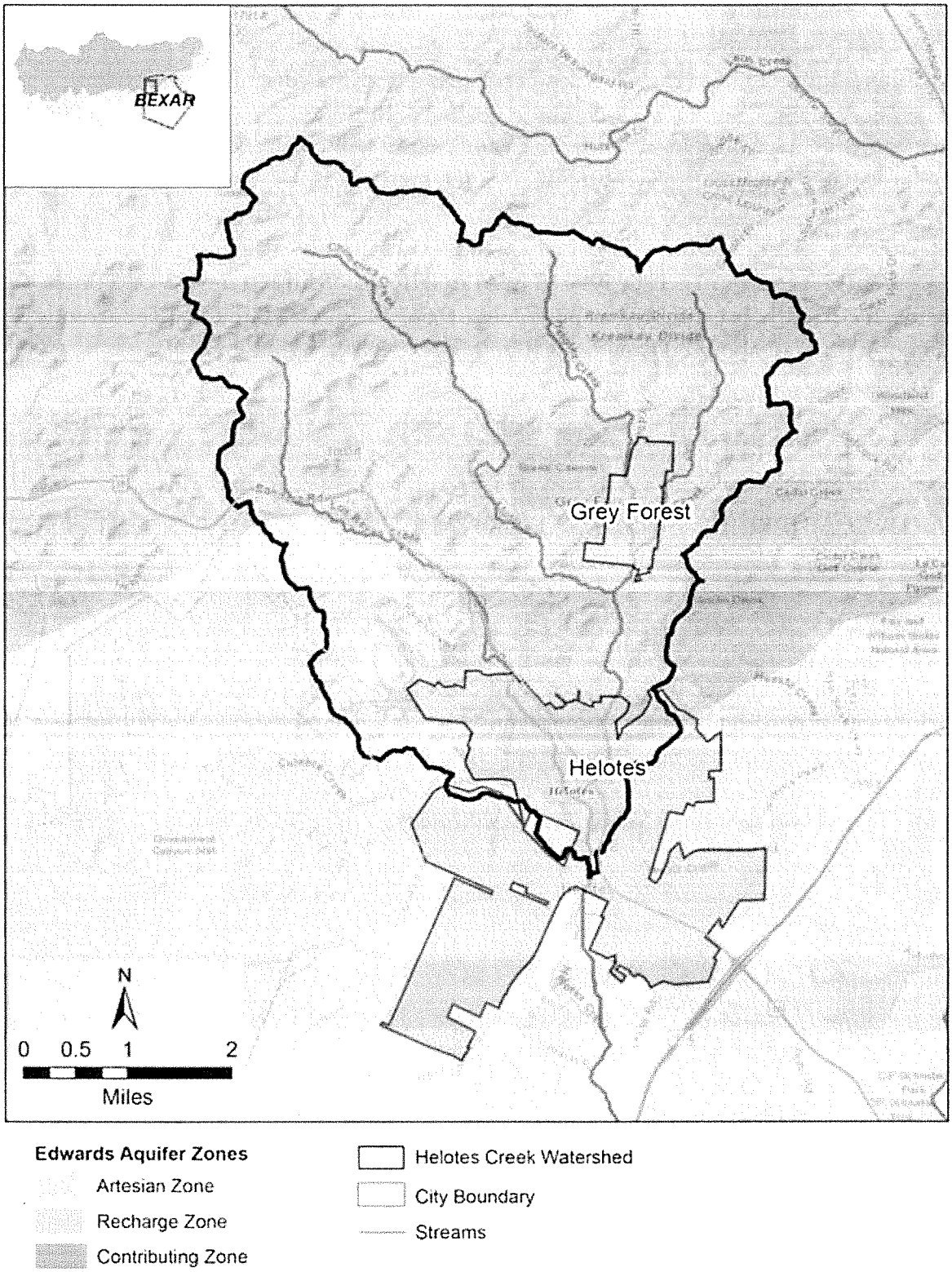

Figure 2-9 Map shows the extent of the City of Helotes and the City of Grey Forest with respect to the Helotes Creek watershed.

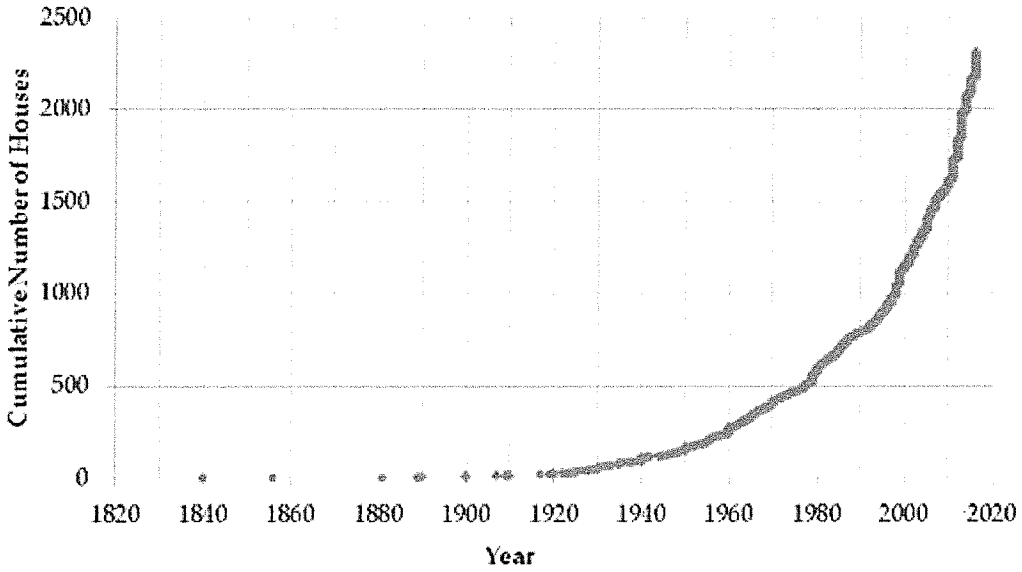

Figure 2-10 Total number of houses that have been built in the Helotes Creek watershed by year.

2.5 Data Collection

Numerous datasets were acquired for this study. Full records of data summarized in this section can be found in Appendix B.

2.5.1 Precipitation and Temperature

Daily precipitation and temperature datasets were acquired from PRISM Climate Group, which provides modeled climate data for the conterminous United States (PRISM Climate Group, 2020). The data are provided at a spatial resolution of 4 square kilometers. While 7 of these 4-km grid cells intersect the watershed, the grid cell that contained the watershed centroid was used as the variation among grid cells was minimal. Data was acquired for the timeframe 01-01-2000 to 09-30-2019. Data included precipitation, minimum, mean, and maximum temperature, and dew point temperature. These values were used as daily inputs for the Precipitation-Runoff Modeling System (PRMS) model. See Appendix B for data processing details.

2.5.2 Streamflow

Streamflow data were acquired from the USGS for Helotes Creek gage 08181400, located at 29°34'42"N, 98°41'29" W (**Figure 2-11**) (U.S. Geologic Survey, 2019). Discharge is available for nearly 30 years, from 12-18-1991 to present. Measurements were recorded every 15 minutes in units of cubic feet per second. Discharge values were used for automated calibration of the standalone PRMS-IV model, manual and automated calibration of the integrated GSFLOW II model and as input to the mixing cell model.

Figure 2-12 shows a hydrograph for the years 1992 to 2019. Time series of annual peak flow at the gage for 1992 through 2019 are shown in **Figure 2-13.** The years with the highest recorded peak discharge in descending order are 1998, 2002, 2007, 2015 and 2018. **Figure 2-14** is a rating curve showing peak annual flow as compared to the recurrence interval. **Figure 2-15** shows daily average discharge at the gage with monthly average precipitation depths from the 4-km gridded precipitation dataset obtained from the PRISM Climate Group.

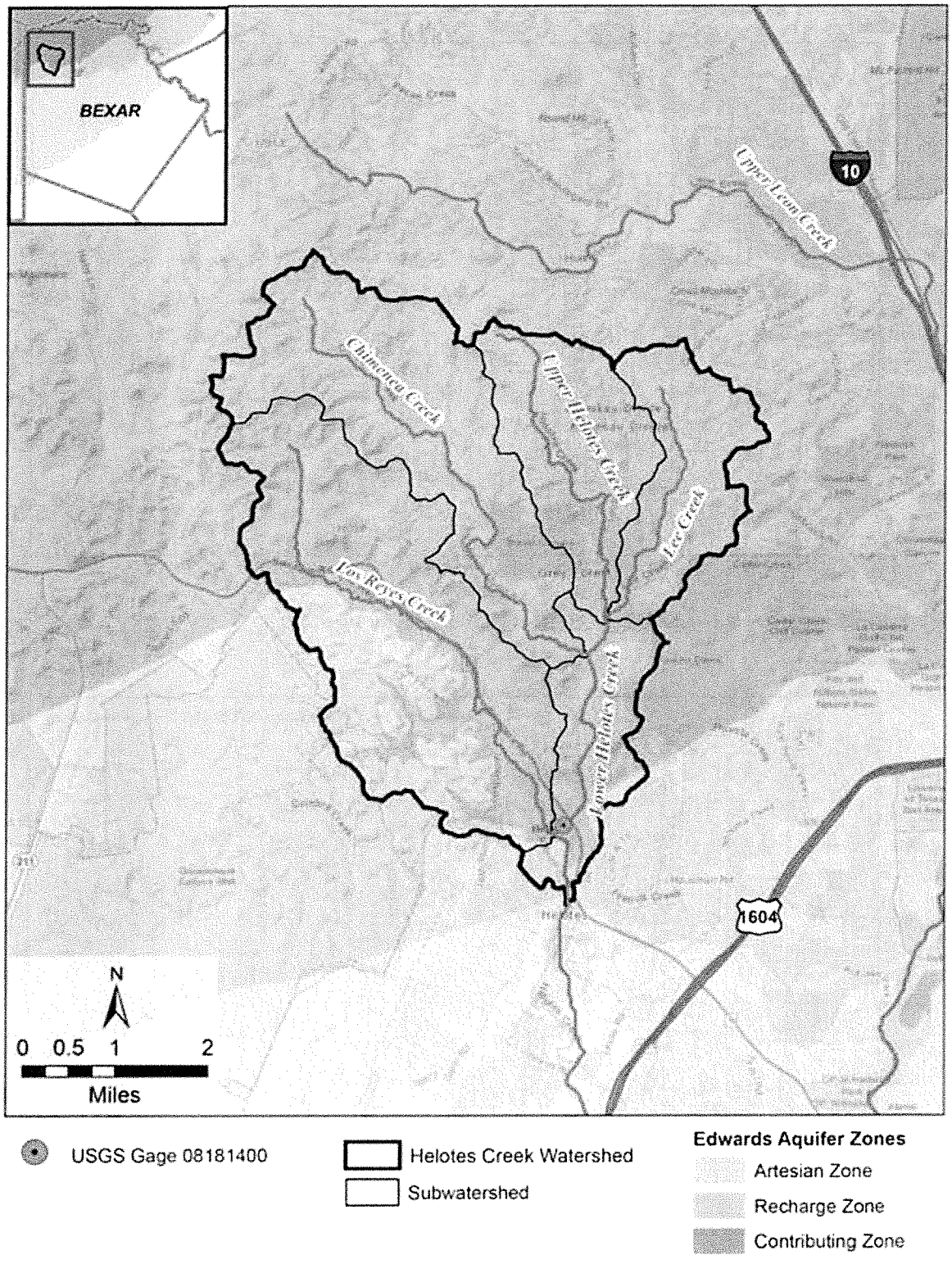

Figure 2-11 Map showing location of USGS gage 08181400 at Helotes Creek.

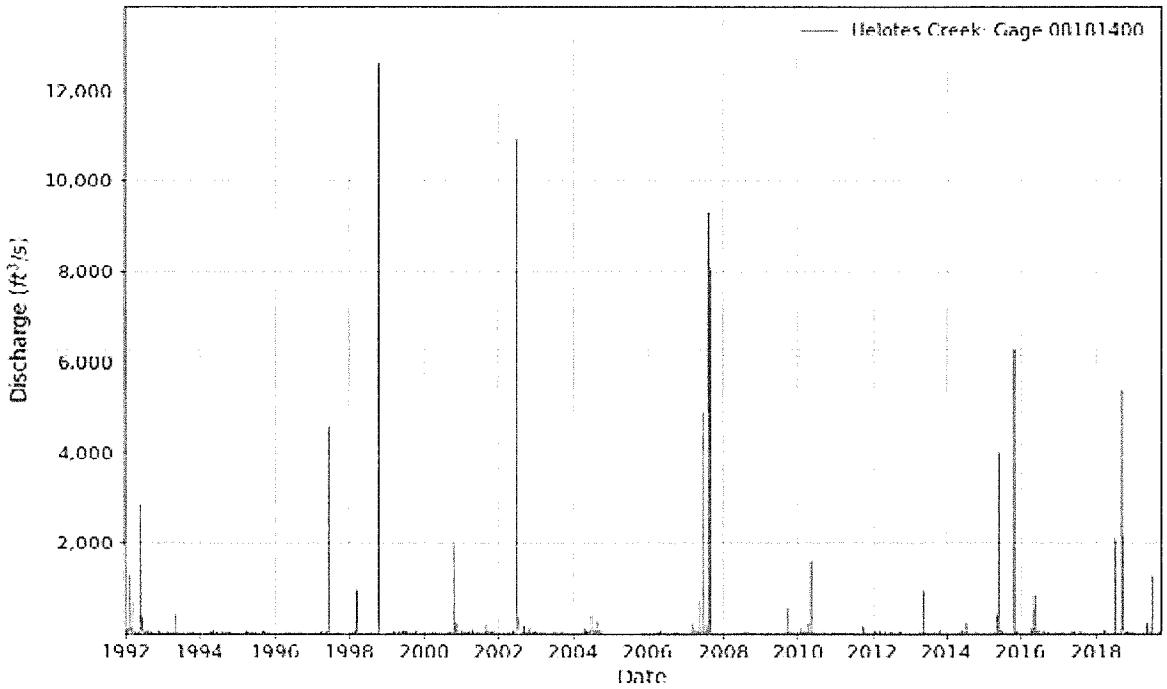

Figure 2-12 Discharge data collected from USGS Helotes Creek gage for 1992-2019.

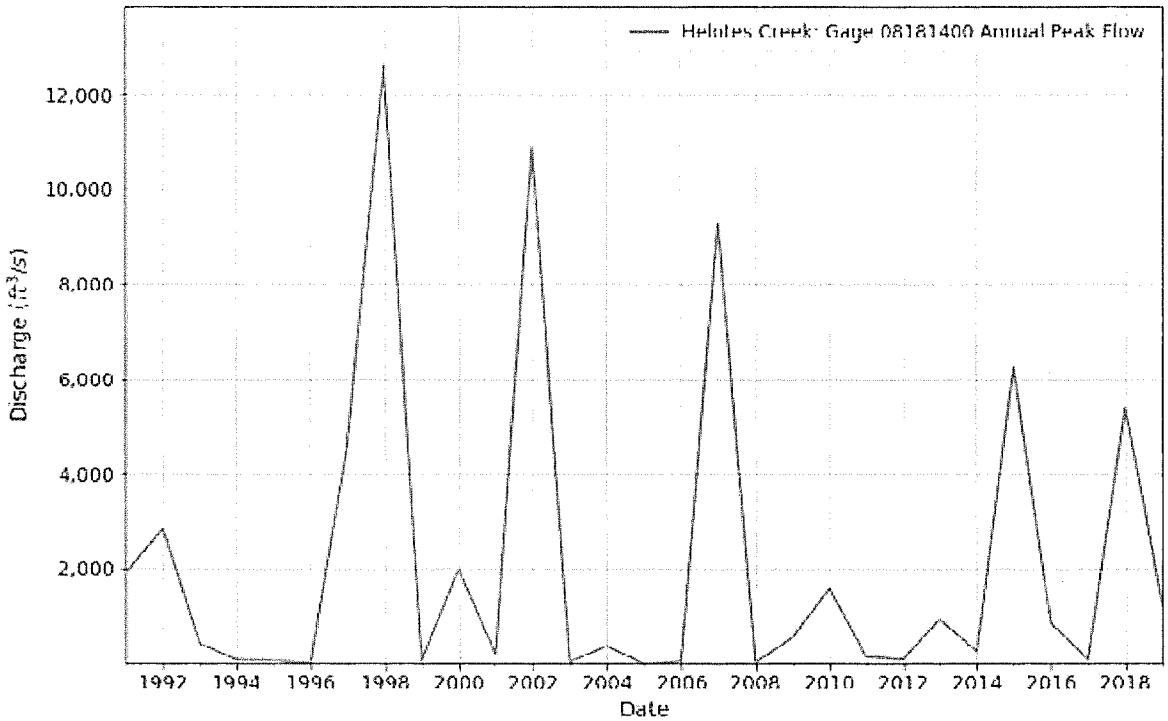

Figure 2-13 Annual average peak discharge at Helotes Creek gage for 1992-2019.

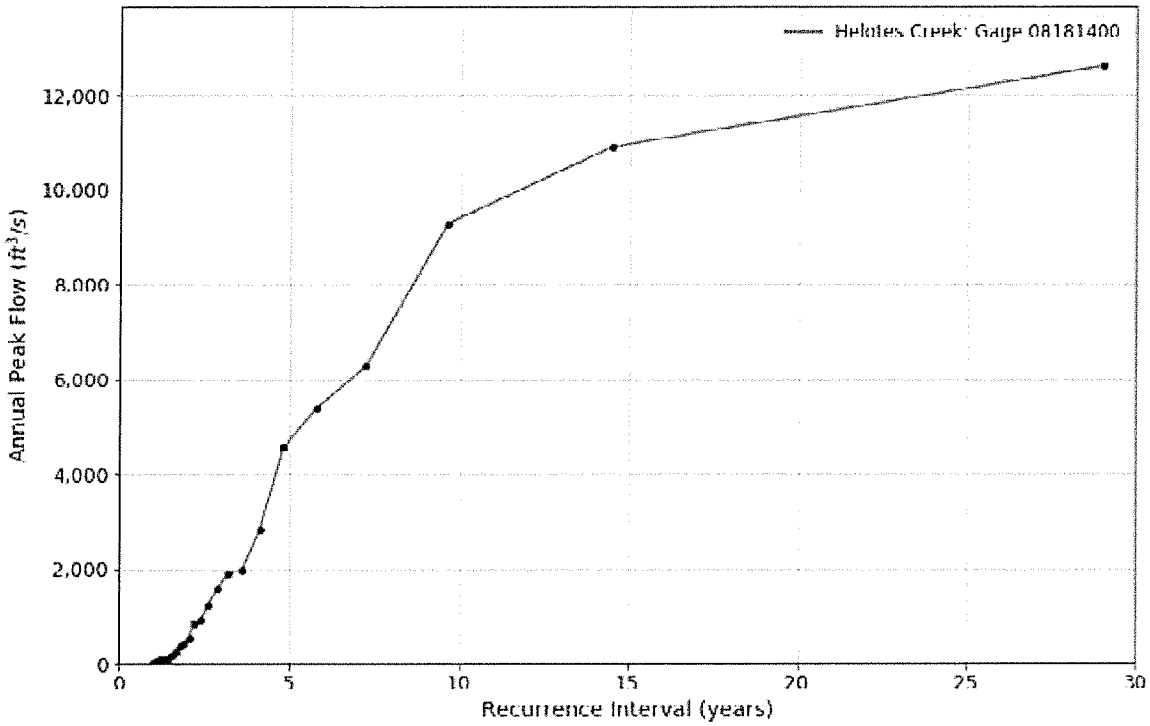

Figure 2-14 Reccurance interval created from the data collected at Helotes Creek gage.

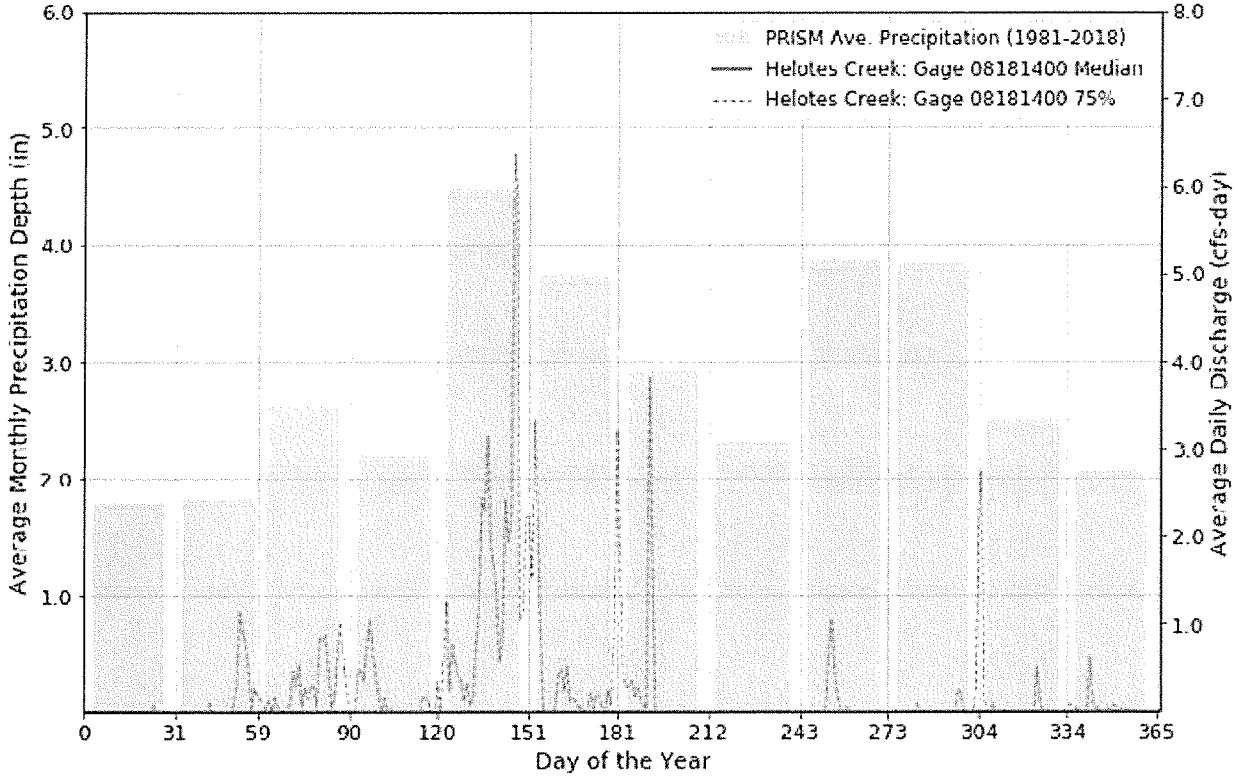

Figure 2-15 Average daily discharge as compared to the average monthly precipiation at Helotes Creek gage.

2.5.3 Digital Elevation Model

SARA provided digital elevation model (DEM) grid data at 1-m resolution in the spatial coordinate system of North American datum of 1983 (NAD 83) Universal Transverse Mercator (UTM) Zone 14N. Fugro was contracted by Texas Natural Resources Information System (TNRIS) to develop the DEM's from airborne LiDAR data collected in 2017. The DEMs were provided as square mile sized tiles and stitched together using mosaicking tools in ArcGIS. The tiles cover the expanse of the Helotes Creek watershed but do not include the northwestern corner of the study area (**Figure 2-16).** The DEM was used to delineate subwatersheds within the Helotes Creek watershed.

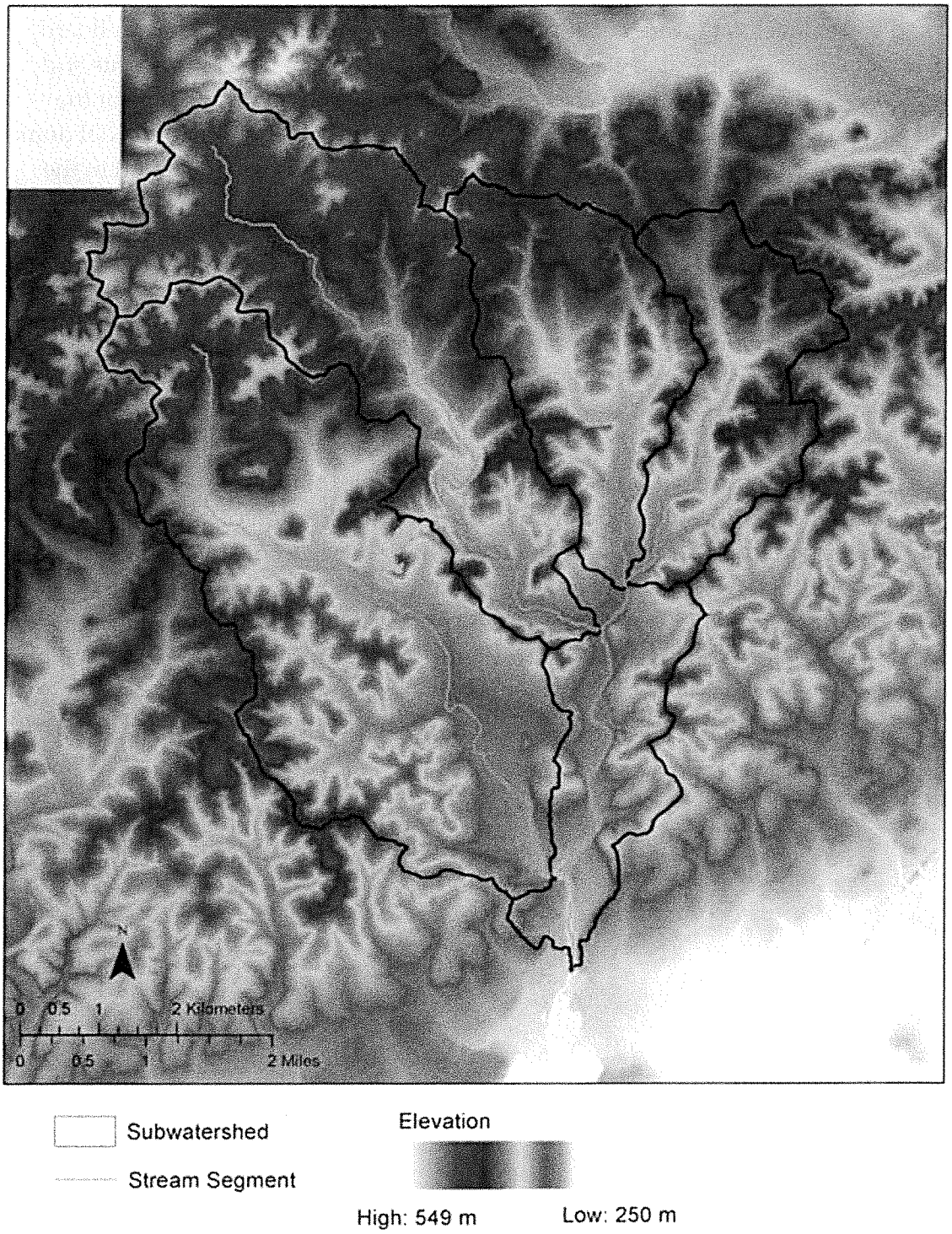

Figure 2-16 DEM of Helotes Creek watershed study area created from series of smaller rasters.

2.5.4 Wells and Water Levels

Well and water level data were acquired from the Texas Water Development Board (TWDB) databases. Freshwater-well data, including water-level measurements and associated well reports, and water chemistry information, were gathered from the TWDB Groundwater database. A total of 173 freshwater wells within the model domain and several additional wells just outside of the model domain were included in the study. Data acquired from the TWDB Brackish Resources Aquifer Characterization System (BRACS) database included geophysical well logs, water levels, and, in some cases, geochemical data. There are 5 reported brackish water wells within the study domain. In addition, the TWDB Submitted Driller Report, or SDR, database was queried for information regarding active and plugged wells along with their associated reports, where available. This effort yielded approximately 330 active and plugged well reports from the SDR database within the model domain (**Figure 2-17**).

Regional potentiometric surface maps from Toll et al. (2018) were used to inform conceptualizations in the study area with respect to the direction of regional groundwater flow. Lack of sufficient well-water level measurements within and around the Helotes Creek watershed prevented the creation of a more localized potentiometric surface. Well- and water-level data provided by the Trinity Glen Rose Groundwater Conservation District and Medina County Groundwater Conservation District were too sparse to sufficiently augment the existing database to support development of a localized potentiometric surface for the Helotes Creek watershed.

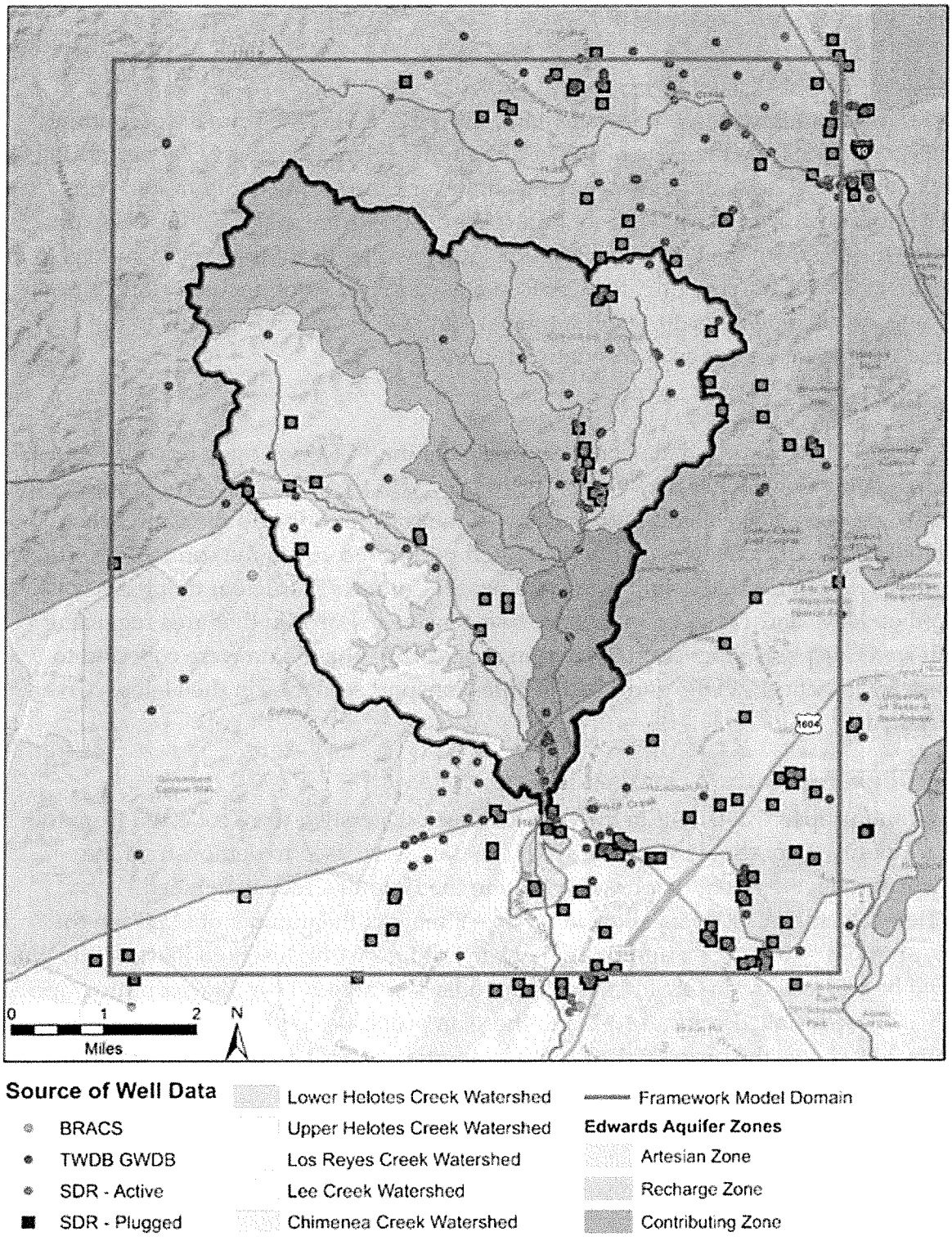

Figure 2-17 Sources of well and water level data in the study area.

2.5.5 Wastewater Treatment

2.5.5.1 OSSFs

The Texas Commission on Environmental Quality (TCEQ) is the primary permitting authority for OSSFs in the State of Texas, although it often delegates OSSF permitting to local entities, such as county governments. In Bexar County, the entity tasked with OSSF permitting is the Bexar County Public Works Department (BCPWD). OSSF data were requested from the BCPWD within the first few months of the project and again in September 2019. Consequently, the OSSF data used in this study include all the OSSFs permitted as of September 19, 2019. A total of 1,412 OSSFs were permitted in the Helotes Creek watershed as of this date (**Figure 2-18**).

2.5.5.2 TPDES and TLAP

TPDES and TLAP permit data were acquired from the TCEQ via open records requests and the online Central Registry Query (https://www15.tceq.texas.gov/crpub/index.cfm). Permit data were first collected for facilities in the contributing and recharge zones within Bexar County. However, due to limited permit records in the county, the search was expanded to include neighboring and nearby counties. Particular emphasis was placed on Hays and Travis counties, due to extensive research in that area regarding wastewater disposal practices (Herrington et al., 2010). These data were collected to inform hypothetical TPDES and TLAP solute-transport scenarios in the Helotes Creek watershed.

2.5.6 Bexar County Appraisal District data

Parcel and property data within the Helotes Creek watershed were collected from the Bexar County Appraisal District (BCAD). The data were used to demonstrate the growth and development that has occurred in the Helotes Creek watershed. Furthermore, the BCAD data allowed for an estimate of the number of OSSFs in the area, operating under the assumption that each property or household in the study area would be serviced by an OSSF. These data would also account for non-permitted OSSFs such as those installed prior to 1975 and those on properties with over 10 acres of land. **Figure 2-19** shows the property lines with properties colored according to the number of houses built on the land parcel.

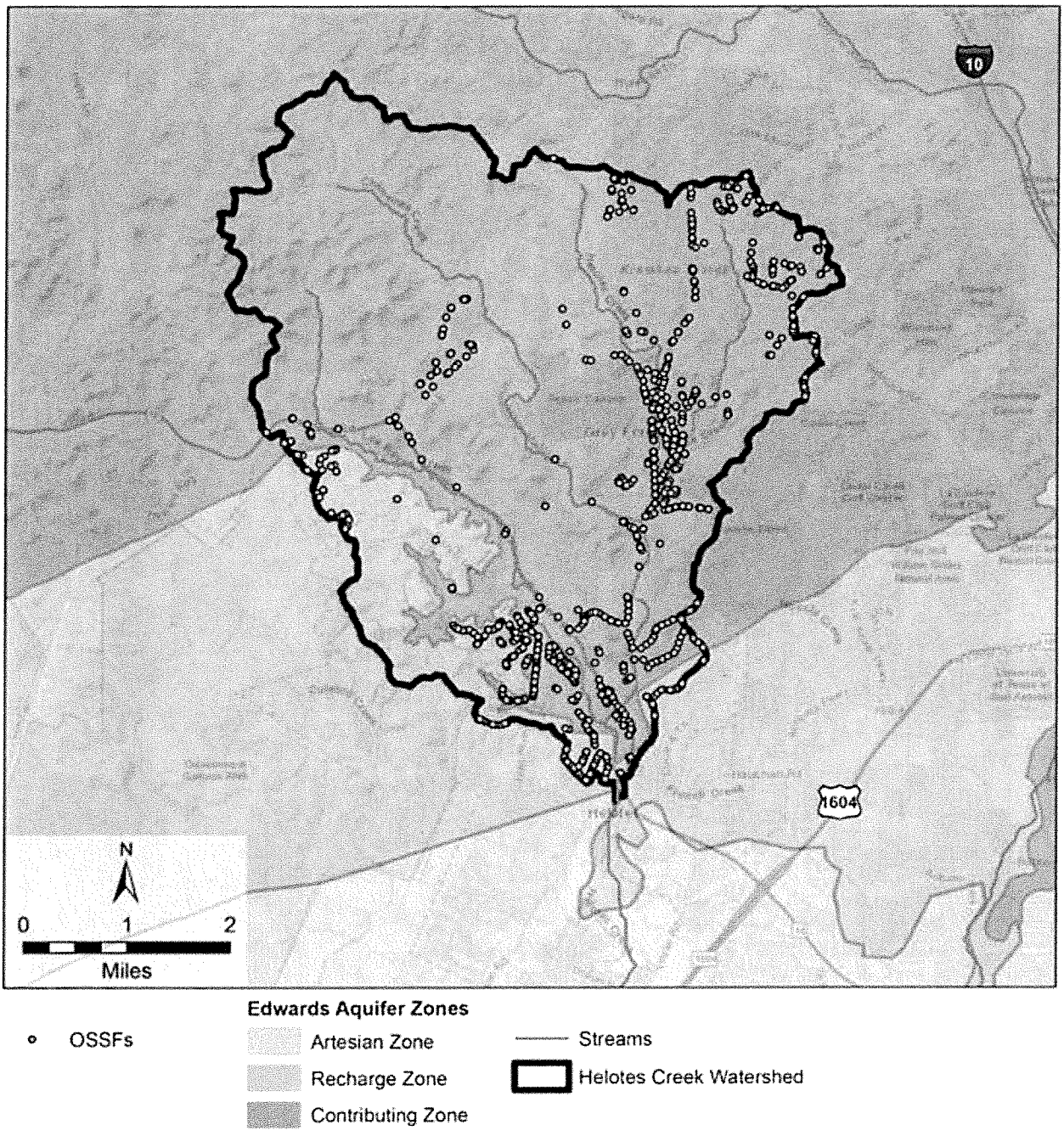

Figure 2-18 OSSFs that are permitted by the Bexar County Public Works Department in the Helotes Creek watershed.

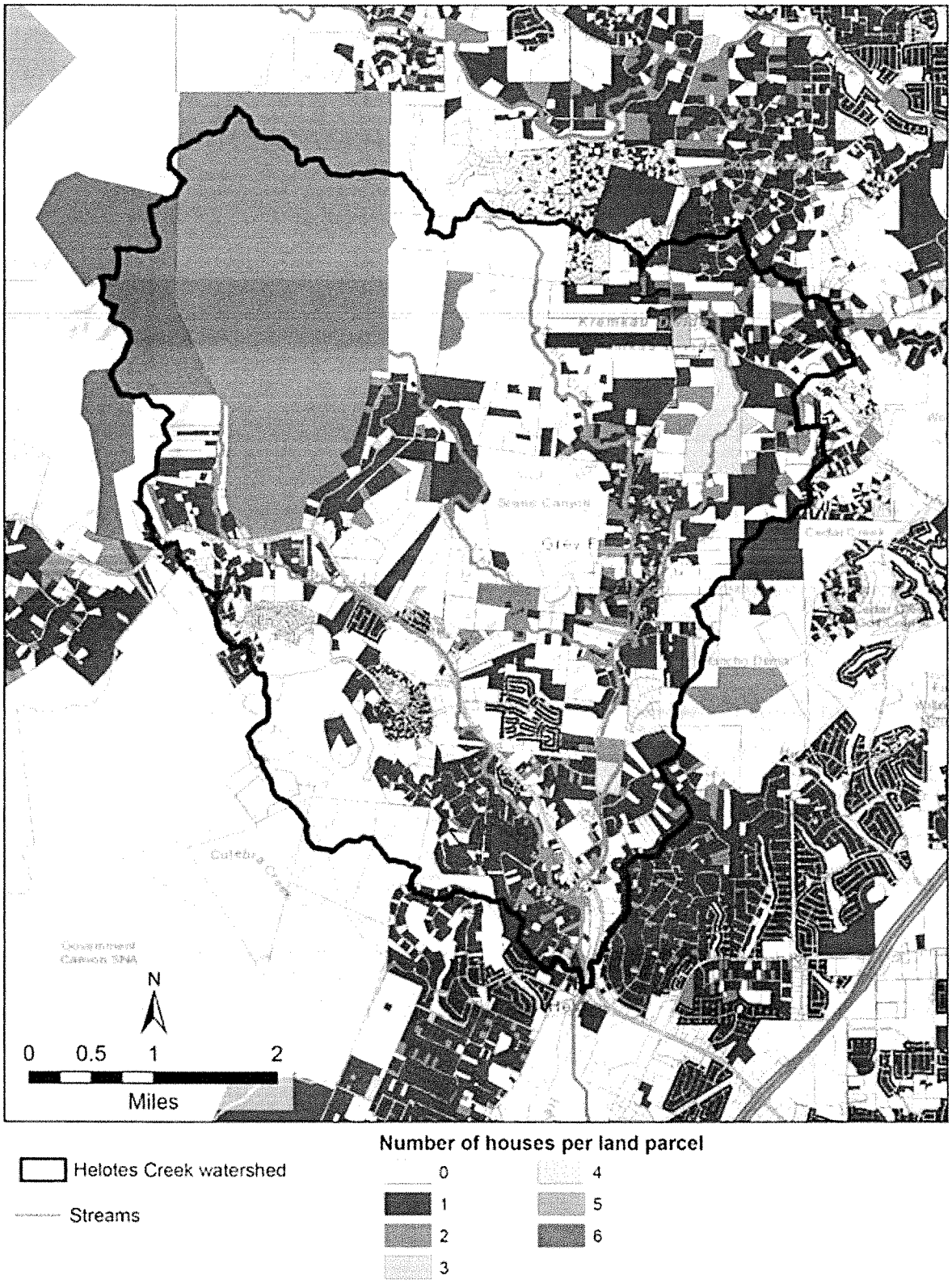

Figure 2-19 BCAD showing the number of houses built on each parcel of land in and around the watershed.

2.5.7 Water Chemistry Data

The Edwards Aquifer Authority and SwRI collaborated on two field sampling campaigns in the Helotes Creek watershed to assess water quality in the watershed and provide water-quality information for use with the Helotes Creek watershed Integrated Hydrologic Model. Sampling campaigns were undertaken in November-December 2018 (high-flow) and October 2019 (low-flow) with the goal of determining water-quality trends and the trophic state of the watershed and its sub-basins.

Surface-water samples were collected at ten sites in 2018 and five sites in 2019, the latter being the only sites out of the original ten where there was sufficient flowing water to sample (**Figure 2-20**). Temperature, pH and Dissolved Oxygen were measured in the field at the time of sample collection. Samples were sent out for laboratory analyses to test for major ions, isotopes, bacteria and nutrients and a suite of pharmaceuticals and personal care products. Results of each sample for bacteria and nutrients are detailed in **Table 2-3**.

Table 2-3 Results for bacteria and nutrient sampling and analysis at ten surface locations in the study area

Site	Date	P, Total	E. coli (MPN/100ml)	NO_3-N	TKN
HC 1	11/28/2018	ND	13	0.276	ND
HC 2	11/28/2018	ND	3	ND	0.201
HC 3	11/28/2018	ND	74	2.51	0.353
HC 4	11/28/2018	ND	12	1.12	0.333
HC 5	11/29/2018	ND	82	0.693	0.266
HC 6	11/29/2018	ND	4	1.76	0.282
HC 7	11/29/2018	ND	32	0.415	0.224
HC 8	11/29/2018	ND	26	0.214	0.299
HC 9	12/12/2018	ND	44	0.944	ND
HC 10	12/12/2018	ND	110	0.225	ND
HC 1	10/2/2019	ND	100	ND	0.222
HC 4	10/2/2019	0.026	150	ND	0.511
HC 5	10/2/2019	ND	60	ND	0.387
HC 6	10/3/2019	ND	84	2.41	0.254
HC 9	10/3/2019	0.021	410	ND	0.266

*ND = Not detected

Reporting Limits: P, Total = 0.02 mg/L; E. coli = 1 MPN/100 mL; NO_3-N = 0.05 mg/L; TKN = 0.2 mg/L

Groundwater samples were collected from six wells in 2019 (**Figure 2-21**). Temperature, pH and Dissolved Oxygen were measured in the field at the time of sample collection. Samples were sent out for laboratory analyses to test for major ions,

isotopes, bacteria and nutrients and a suite of pharmaceuticals personal care products. Results for each sample for bacteria and nutrients are detailed in **Table 2-4**.

Table 2-4 Results for bacteria and nutrient sampling and analysis at six well locations in the study area.

Well	Date	P, Total	NH_3 - N	E. coli (MPN/100ml)	NO_3-N	TKN
AY-68-27-2WM	9/25/2019	0.058	ND	ND	0.783	0.38
AY-68-27-5LP	9/26/2019	ND	0.444	ND	ND	0.522
AY-68-19-5SK	10/15/2019	ND	0.101	ND	0.568	ND
AY-68-27-208	10/15/2019	ND	0.132	ND	ND	0.312
AY-68-27-2GH	10/16/2019	ND	ND	ND	ND	ND
AY-68-27-2HN	11/19/2019	0.022	0.319	50	ND	0.6

Reporting Limits: P, Total = 0.02 mg/L; NH_3 - N = 0.10 mg/L; E. coli = 1 MPN/100 mL; NO_3-N = 0.05 mg/L; TKN = 0.2 mg/L

Periphyton and seston samples were collected to provide additional insight into the trophic state of the Helotes Creek watershed. Periphyton and seston samples were collected at five of the surface-water sites in 2019 (**Figure 2-22**) and sent to the Center for Reservoir and Aquatic Systems Research (CRASR) for analyses. Periphyton samples were tested for chlorophyll-a (CHLA), ash-free dry mass (AFDM), phosphorus percentage, carbon and nitrogen percentage, and the stable isotopes $\delta^{13}C$ and $\delta^{15}N$. Seston samples were tested for CHLA and AFDM. Results from periphyton samples for carbon and nitrogen isotopes as well as %C and %N are shown in **Table 2-5**. Results from periphyton samples for chlorophyll-A are shown in **Table 2-6**. Results from seston samples for chlorophyll-A are shown in **Table 2-7**.

Table 2-5 Results from periphyton and seston sampling and analysis at five surface locations in the study area.

Site	Date	Periphyton $\delta^{13}C$ (‰)	Periphyton $\delta^{13}C$ (‰)*	Periphyton $\delta^{15}N$ (‰)	Periphyton $\delta^{15}N$ (‰)*	%C	%C*	%N	%N*
HC 1	10/2/2019	-17.87	-18.71	4.07	3.88	9.94	9.94	0.43	0.45
HC 4	10/2/2019	-19.79	-20.12	6.89	7.09	7.41	7.57	0.50	0.48
HC 5	10/2/2019	-17.57	-17.34	6.81	7.13	6.63	6.66	0.24	0.28
HC 6	10/3/2019	-19.33	-21.19	5.43	5.41	8.47	7.45	0.49	0.50
HC 9	10/3/2019	-21.93	-22.93	8.99	8.27	6.88	6.92	0.44	0.43

Table 2-6 Results from periphyton samples for chlorophyll-A (CHLA) at five surface locations in the study area.

Site	Date	Periphyton CHLA (mg/m^2)
HC 1	10/2/2019	19.59

HC 4	10/2/2019	17.90
HC 5	10/2/2019	27.49
HC 6	10/3/2019	47.11
HC 9	10/3/2019	43.09

Table 2-7 Results from seston samples for chlorophyll-A (CHLA) at five surface locations in the study area.

Site	Date	Seston CHLA (mg/sample)*
HC 1	10/2/2019	0.0739
HC 4	10/2/2019	0.0048
HC 5	10/2/2019	0.0040
HC 6	10/3/2019	0.0204
HC 9	10/3/2019	0.0233

Dodds et al. (1998) established a suggested classification of a stream or stream system's trophic state based on variables such as mean benthic chlorophyll, maximum benthic chlorophyll, sestonic chlorophyll, total nitrogen (TN), and total phosphorus (TP). Streams and stream systems with low concentrations of these constituents are classified as oligotrophic, moderate concentrations are classified as mesotrophic, and high concentrations as eutrophic. This classification scheme is detailed in **Table 2-8**.

Un-impacted Texas Hill County streams and rivers have low concentrations of these constituents and are classified as oligotrophic. Streams and rivers closer to urban areas that experience development have elevated concentrations these constituents in addition to bacteria, viruses, and emerging contaminants (Herrington, 2005; Herrington, 2008; Herrington & Scoggins, 2006, Mahler et al,. 2011 a,b,c; Musgrove et al., 2018). If concentrations are sufficiently high (**Table 2-8**), streams and rivers would be considered mesotrophic or even eutrophic. Streams with elevated concentrations of nutrients (i.e., phosphorous and nitrogen) are prone to algae growth and may exhibit undesirable qualities including reduced clarity, foul odor, and bad taste.

Table 2-8 Trophic classification of a stream (Dodds et al., 1998).

Variable	Oligotrophic-mesotrophic boundary	Mesotrophic-eutrophic boundary
Mean benthic chlorophyll (mg/m^2)	20	70
Maximum benthic chlorophyll (mg/m^2)	60	200
Sestonic chlorophyll ($\mu g/L$)	10	30

TN (µg/L)	700	1500
TP (µg/L)	25	75

Water-chemistry results were not useful when delineating the trophic state of Helotes Creek watershed, due to the fact that nitrogen and phosphorus sample concentrations were at or below the detection limits. For this reason, concentrations of nutrients in periphyton and sestonic samples, which have much lower detection limits compared with similar concentrations in water samples, were considered in order to determine the trophic state of Helotes Creek watershed.

Examination of the Helotes Creek seston data indicates that sestonic chlorophyll ranges from 4.04 to 73.9 µg/L (**Table 2-7**). The average sestonic chlorophyll value across the five sites is 25.3 µg/L. Sites HC1 and HC9 may overestimate this value due to the presence of some benthic material in the sample. If potentially overestimated values are excluded, the average sestonic chlorophyll value is 9.74 µg/L. These two averages would indicate that the Helotes Creek watershed was either in a slightly mesotrophic or oligotrophic state during the 2019 sampling period, respectively. There were no discernible sestonic trends for subwatersheds.

The periphyton (the source of benthic chlorophyll in this project) values for the Helotes Creek watershed range from 17.90 to 47.11 mg/m^2 with an average of 31.04 mg/m^2. This average value indicates that the Helotes Creek watershed is in an oligotrophic state, as it is below the oligotrophic-mesotrophic boundary for maximum benthic chlorophyll. However, the average value is also above the mean benthic chlorophyll value for the oligotrophic-mesotrophic boundary (20 mg/m^2), indicating the watershed could be slightly mesotrophic. There were no discernible periphyton trends for subwatersheds. Additional periphyton and seston sampling would be needed to further constrain the current trophic state of the Helotes Creek watershed.

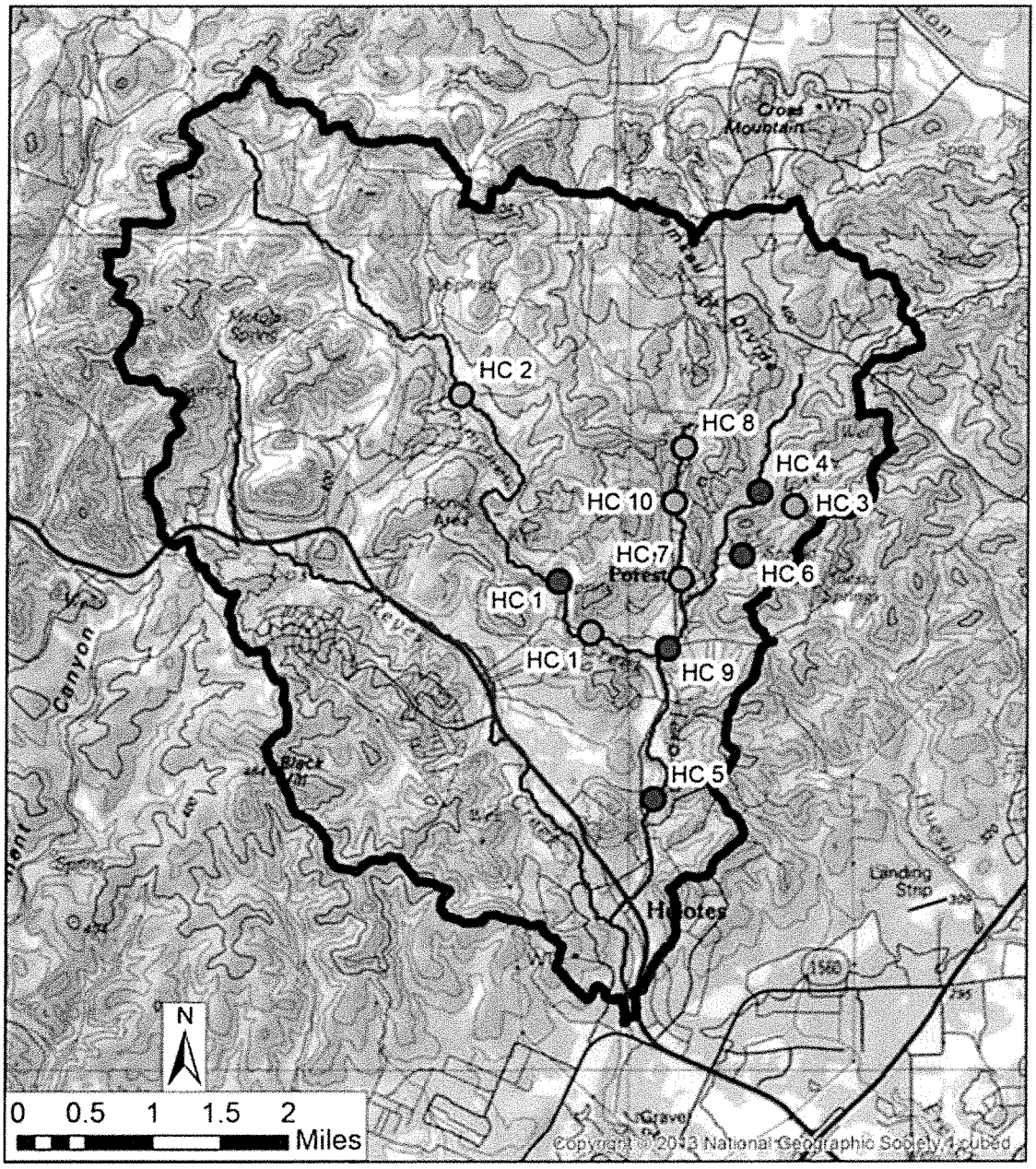

Figure 2-20 Surface water locations where water samples were collected in 2018 and 2019.

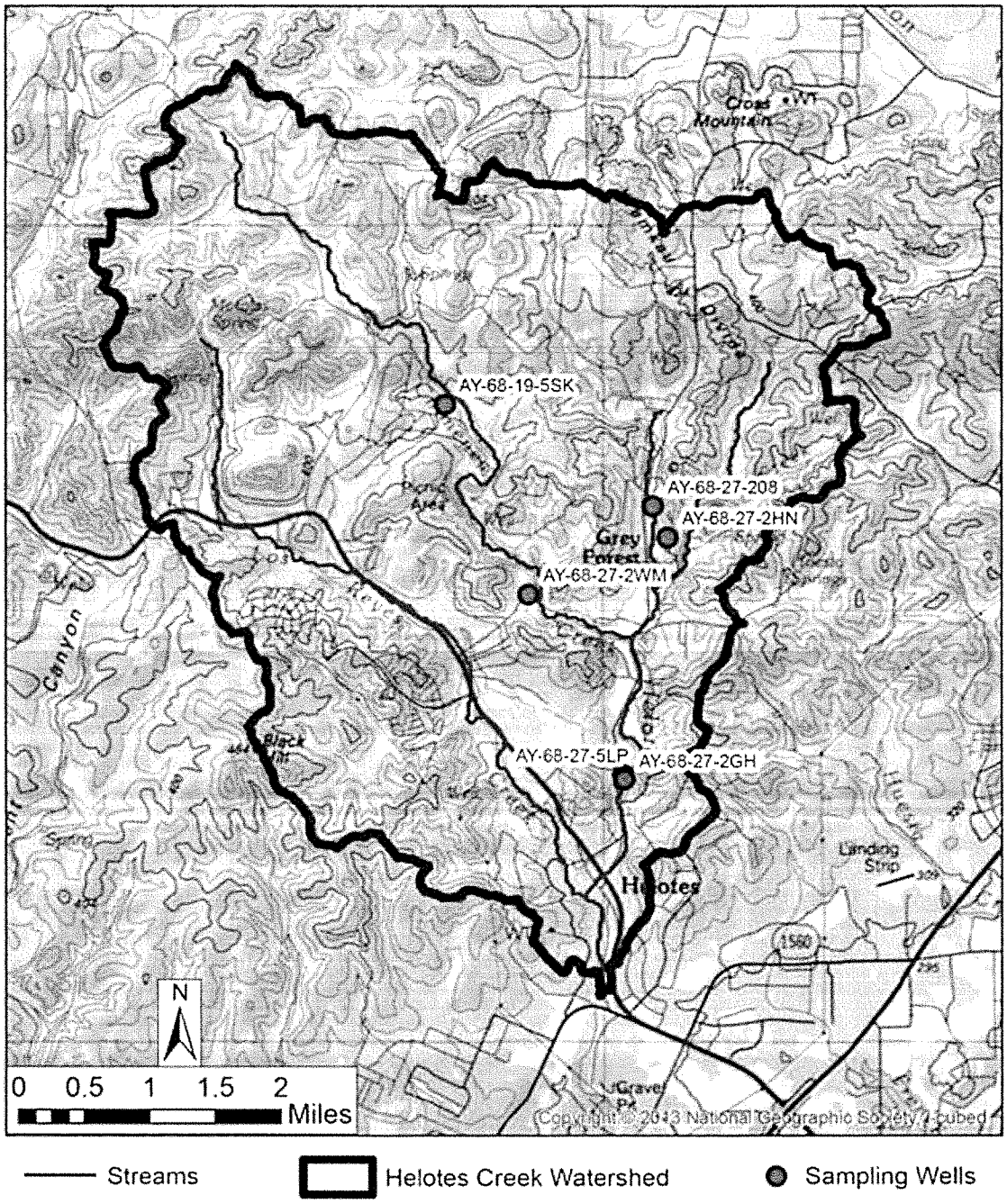

Figure 2-21 Well locations where water samples were collected in and 2019.

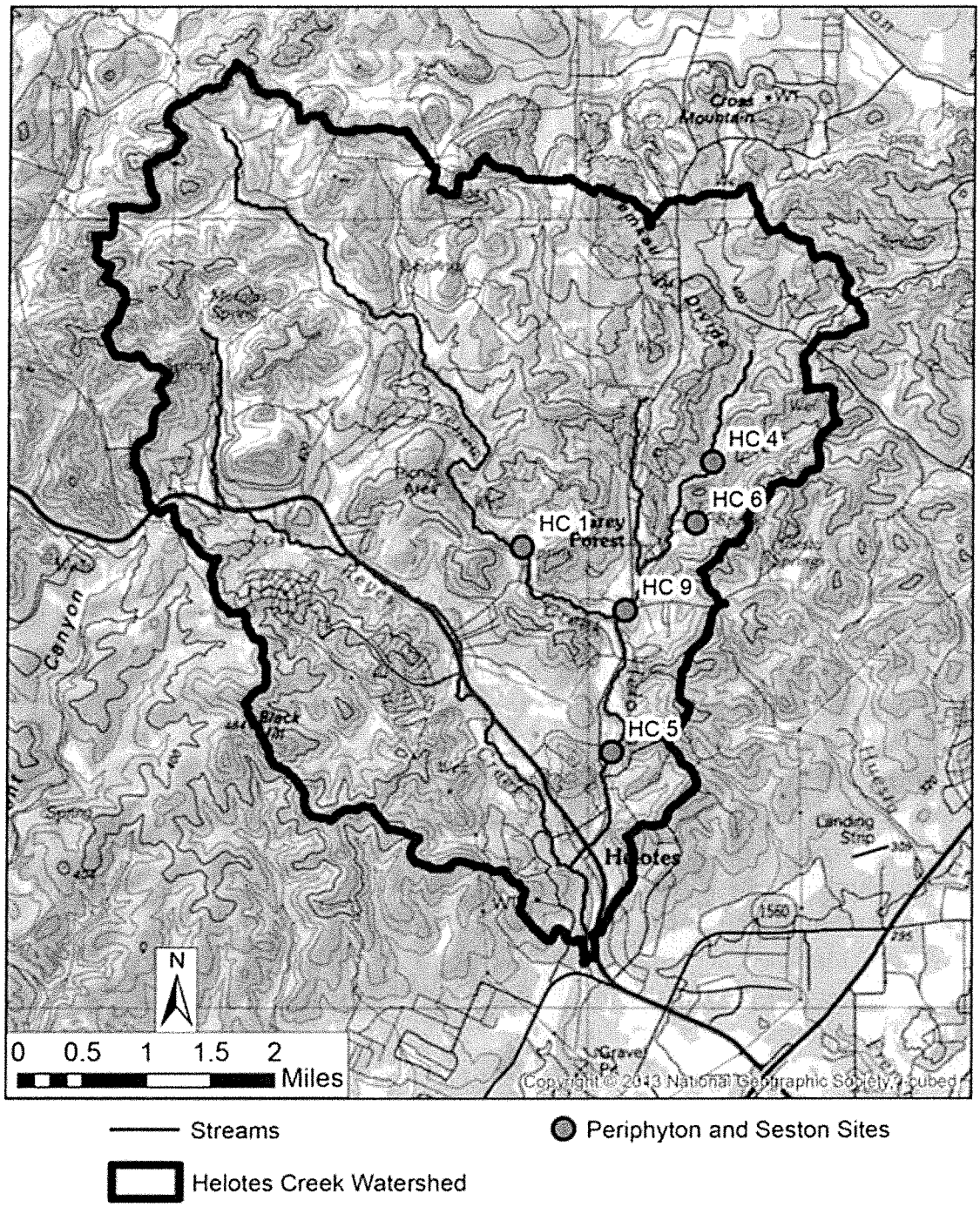

Figure 2-22 Surface water locations where water samples were collected for periphyton and seston 2019.

3 Wastewater Disposal Facility Scenarios

The scope of this project is to evaluate the impact of different wastewater disposal facilities on the quality of water that recharges the Edwards Aquifer. Because the Helotes Creek watershed study area does not include examples of all wastewater disposal facility types, hypothetical examples were identified to allow for assessment of the impact of each potential wastewater disposal facility type. Accordingly, eight hypothetical scenarios were identified to cover the reasonable range of wastewater disposal facility type. These scenarios assess the impact of future development in the watershed as well as that of current unpermitted facilities, current malfunctioning facilities, and possible alternative wastewater disposal facilities such as TPDES and TLAP facilities. Each scenario was evaluated using solute-transport simulation.

Limited data from and investigation of TPDES and TLAP facilities in Bexar County are available for scenario development. Studies in the Barton Springs segment of the Edwards Aquifer, in and around Austin, that document the rise in residential development since 2000 and a subsequent increase in impervious cover and an increase in treated wastewater disposal were used to augment scenario development. Given the similarities in urban growth between the two areas, patterns of development seen in the Barton Springs segment of the Edwards Aquifer are anticipated to occur in San Antonio and Bexar County. Investigations of the surge in the number of OSSF and TLAP facilities have been particularly useful (Herrington et al., 2010). These investigations document that the increase in treated wastewater disposal is linked to increased nitrates in surface water and groundwater and that this increase matches the timing of development (Mahler et al., 2011a; Musgrove, et al., 2016). Elevated nitrate concentrations detected downstream of TLAPs have been shown to be caused by inconsistent permitting practices (Ross, 2011).

Total nitrogen (TN) was selected as the conservative tracer for solute-transport simulations. Although nitrogen transforms throughout wastewater treatment processes (e.g., conversion of organic nitrogen to ammonium in septic systems), its quantity through these transformations doesn't significantly vary, thus making it a representative conservative tracer for the purposes of the transport simulation. Furthermore, nitrogen was selected due to its critical importance in assessing environmental health of natural water systems and because of its potential public health impacts. The solute-transport simulations consider both mass loading and relative nitrogen concentration before and after simulated wastewater disposal activities

representative in each scenario. The receiving (impacted) body of the solute-transport simulation is that portion of the recharge zone of the Edwards Aquifer that is recharged by the Helotes Creek watershed plus that portion of the Edwards Aquifer that receives mass loading from the Helotes Creek watershed via transport through the Trinity Aquifer.

Two potential mechanisms could result in the Helotes Creek watershed impacting the quality of water recharged to the Edwards Aquifer south of the watershed:

1. **Interformational communication between the Trinity and Edwards aquifers:** In the study area, the Haby Crossing Fault in the southernmost portion of the watershed has resulted in the juxtaposition of the Cavernous Glen Rose (a Trinity unit) and the Kainer Formation (an Edwards unit) and other Edwards units. According to Ferrill et al. (2005), 60 – 100% of the faulted Trinity units in the area are in contact with Edwards units. In Johnson (2018), a study of the Helotes mulch fire of 2006 revealed potential hydraulic communication across the fault, indicated by the movement of contaminated water from the upper Glen Rose Formation into the Edwards Aquifer. A dye trace study conducted at Panther Springs Creek in another area of northern Bexar County also demonstrated direct hydraulic communication between the Trinity and Edwards aquifers in close proximity to the study area (i.e., within 5 miles) (Johnson, Schindel, & Veni, 2010). In the solute-transport simulations, the Cavernous Glen Rose was considered as the main transmissive Trinity unit in communication with Edwards units at the Haby Crossing Fault. As noted in Section 2.3.3, the conceptualization embraced in this evaluation is that Haby Crossing Fault does not act as a barrier to flow and that virtually all water that discharges from the Helotes Creek watershed north of Haby Crossing Fault eventually recharges the Edwards Aquifer in close proximity to the study area **(Figure 3-1)**.

2. **Additional recharge during storm events:** The lower portion of Helotes Creek slightly north and south of the USGS gage is within the Edwards Aquifer recharge zone or is located where the upper units of the Trinity Aquifer are exposed. These upper units have been shown to be in direct hydraulic communication with the Edwards Aquifer and effectively act as the Edwards Aquifer recharge zone (Gary et al., 2011). Immediately south of this part of the Helotes Creek watershed is a quarry where the Edwards Aquifer recharge zone has been exposed by removal of the Del Rio Clay. Observations following storm events have confirmed that water north of the quarry recharges the aquifer in this area.

3.1 OSSF Scenarios

The OSSFs were grouped into nine polygons for representation in the Helotes Creek watershed (**Figure 3-2**). These groupings were delineated primarily based on local fault blocks, although density and proximity of the OSSFs to one another were also considered. OSSFs that were geographic outliers (e.g., relatively isolated from areas of high OSSF density) were added to the totals for the nearest OSSF group polygon. **Table 3-1** lists the estimated number of OSSFs per group polygon. **Table 3-2** shows the details of each scenario for quick reference.

Table 3-1 Estimated number of OSSFs per group polygon.

Group Number	Number of OSSFs
1	176
2	334
3	105
4	103
5	352
6	87
7	101
8	89
9	65
Total:	**1,412**

3.1.1 Base Case

The Base Case rtepresents the current number of permitted on-site sewage facilities in the Helotes Creek watershed. Data received from the Bexar County Public Works Department in September 2019 identifies 1,412 permitted OSSFs in the watershed. The Base Case depicts the current state of the Helotes Creek watershed, given that OSSFs are the only type of wastewater disposal practice active in the watershed.

Mass loading from the OSSFs is to the surface of the water table. Total nitrogen mass loading for the Base Case is 40 mg/L, a value selected based on studies that examined nitrogen contributions of septic systems to water resources (Barrett & Charbeneau, 1997; Canter & Knox, 1985). The average flow from these septic systems is estimated at 680 L/capita/day (Barrett & Charbeneau, 1997; U.S. EPA, 1980).

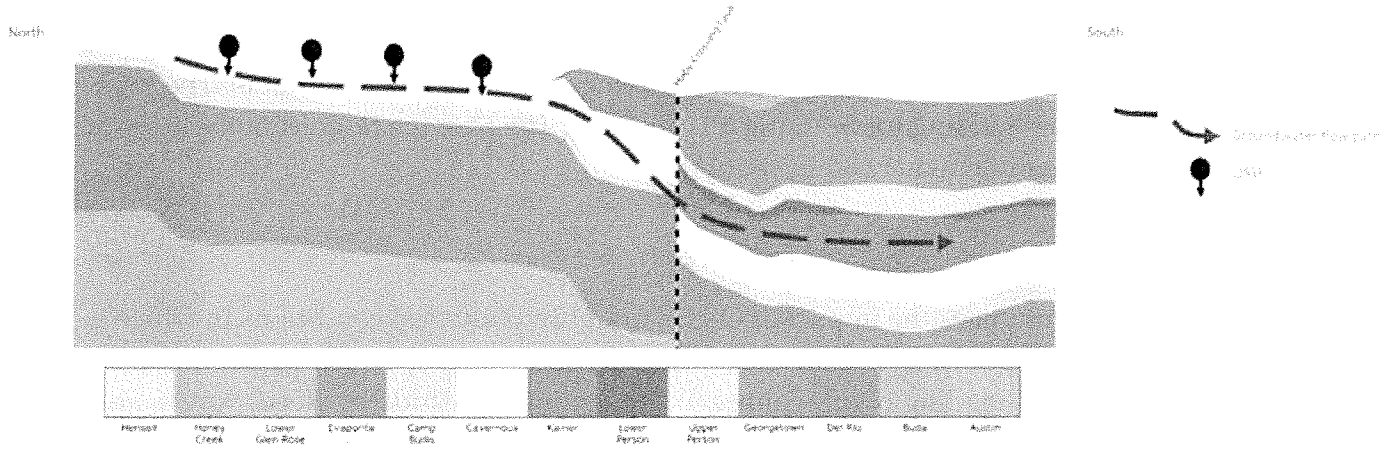

Figure 3-1 Cross-section at Haby Crossing Fault showcasing theoretical flow path into the Edwards Aquifer.

3.1.2 Scenario 1 – Permitted and Hypothetical Non-Permitted OSSFs

Scenario 1 simulates the impact of both permitted OSSFs and potential non-permitted OSSFs. In Bexar County, OSSFs installed prior to 1975 were required to be registered, although many may not have been officially accounted for in the Bexar County database. Furthermore, Bexar County differs from most Texas counties in that OSSFs must be permitted regardless of the property size. Therefore, even OSSFs serving properties of 10 acres or larger should be included in the database. The only potential OSSFs that may not yet be registered would be any that were not grandfathered after 1975. In order to account for potential discrepancies between the number of permitted OSSFs (Base Case) and the actual total number of OSSFs (permitted + non-permitted), 2018 data from the Bexar County Appraisal District (BCAD) were acquired (**Figure 3-3**). The assumption made is that each property in the BCAD records is served by at least one OSSF, regardless of the property's age or acreage. In order to estimate non-permitted OSSFs that date to prior to 1975, BCAD data were used to determine the number of households built prior to 1975. These properties were then compared with the OSSF shapefile obtained from the Bexar County Public Works Department to find the number of households that may be equipped with or were at some point equipped with OSSFs but are not registered.

This method prevented duplication of OSSFs for properties that were established during or after 1975 and whose OSSFs are most likely included as permitted OSSFs in the Bexar County Public Works Department records. The non-permitted OSSFs were grouped into the same polygons as those developed for the Base Case. The combined

number of permitted OSSFs (1,412) and non-permitted proxy OSSFs (216) is 1,627 OSSFs.

Similar to the Base Case, mass loading is to the surface of the water table. The total nitrogen mass loading for Scenario 1 is 40 mg/L. The average flow from these septic systems is maintained at 680 L/capita/day.

3.1.3 Scenario 2 – Failing OSSFs

Scenario 2 simulates the impact of OSSFs under hypothetical conditions in which a portion of the OSSFs are failing. For this scenario, a "failing" septic system would result in higher mass loading of total nitrogen. According to a study by Reed, Stowe, and Yanke, LLC (2002) that focused on the magnitude of chronically malfunctioning OSSFs in Texas, about 13% of the Texas permitted OSSFs are likely failing. They found that the systems most likely to be chronically malfunctioning were old septic systems constructed prior to the establishment of regulations. These systems were typically grandfathered into their respective regulatory databases without insuring performance compliance. Therefore, for Scenario 2, 13% of OSSFs per grouping are considered as potentially malfunctioning (**Figure 3-4**).

Mass loading is to surface of the water table, however, total nitrogen mass loading for the 13% of malfunctioning OSSFs in Scenario 3 is 80 mg/L, a value double of that assigned to a properly functioning OSSF. The average flow from these septic systems is maintained at 680 L/capita/day, the average flow of OSSFs found in the literature (Barrett & Charbeneau, 1997; U.S. EPA, 1980).

3.1.4 Scenario 3 – Future increase in OSSFs

Scenario 3 simulates the impact of OSSFs based on the potential increased number of OSSFs that would be present in five years. The projected number of OSSFs is based on the projected population growth in Bexar County and Helotes, as well as the projected growth in the number of households in both. Although much of the study area is outside of the city limits of Helotes and in either the City of Grey Forest or in the Extra Territorial Jurisdiction of the cities of Helotes, Grey Forest, or San Antonio, growth projections for the City of Helotes are used to establish estimated increases in population and households for the purposes of this study.

According to the U.S. Census Bureau, Bexar County and the City of Helotes experienced an increased change in population of 15.8% and 30.2%, respectively, between 2010 and 2018. In comparison, a growth-rate profile prepared by the Helotes

Economic Development Corporation in 2014 projected an increase in population of 17.5% between 2014 and 2019 and a projected growth rate of 29.7% between 2010 and 2019. With respect to the number of households, the same profile projected a growth of 6.4% between 2010 and 2014 and a growth rate of 15.7% between 2014 and 2019.

Scenario 3 assumes that an OSSF will be installed at each new household in the northern portion of the watershed over the next 5 years. No additional households are added to the southern portion of the watershed because this area is essentially built out and no additional residential construction is anticipated. Consequently, Scenario 3 assumes a growth in the number of OSSFs of 15% relative to the number permitted OSSFs in the northern portion of the watershed as of September 2019. This would result in a total of 1,516 OSSFs by September 2024 (**Figure 3-5**). Most of the new OSSFs in Scenario 3 are added to the OSSF groupings in the northern reaches of the watershed, since this is where there is the greatest potential for development of new subdivisions. Mass loading is to the surface of the water table. The total nitrogen for Scenario 3 is 40 mg/L and average flow from these septic systems is maintained at 680 L/capita/day.

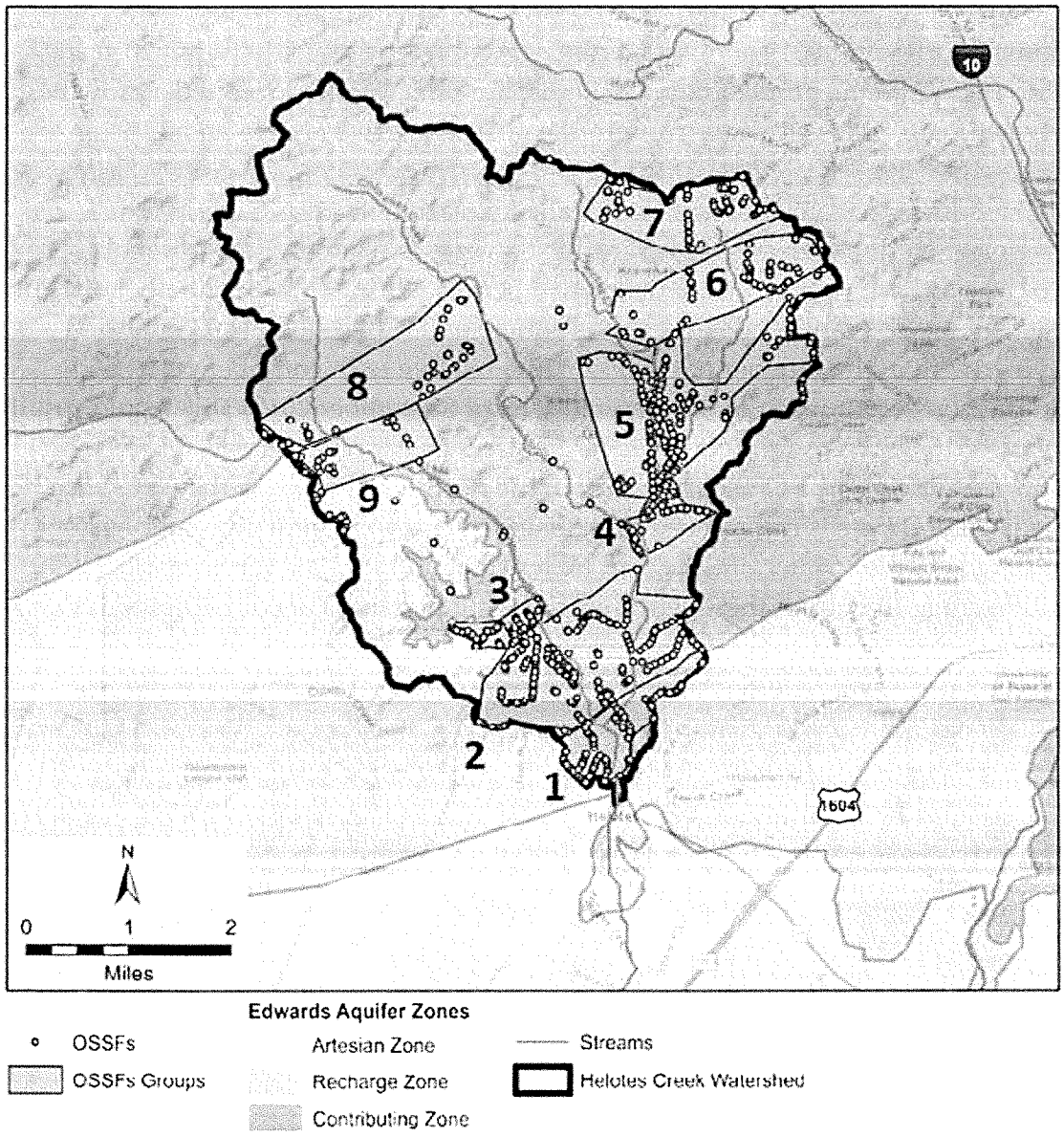

Figure 3-2 Permitted OSSFs (orange points) and groupings (purple polygons) in the Helotes Creek watershed, OSSF group numbers included (Base Case).

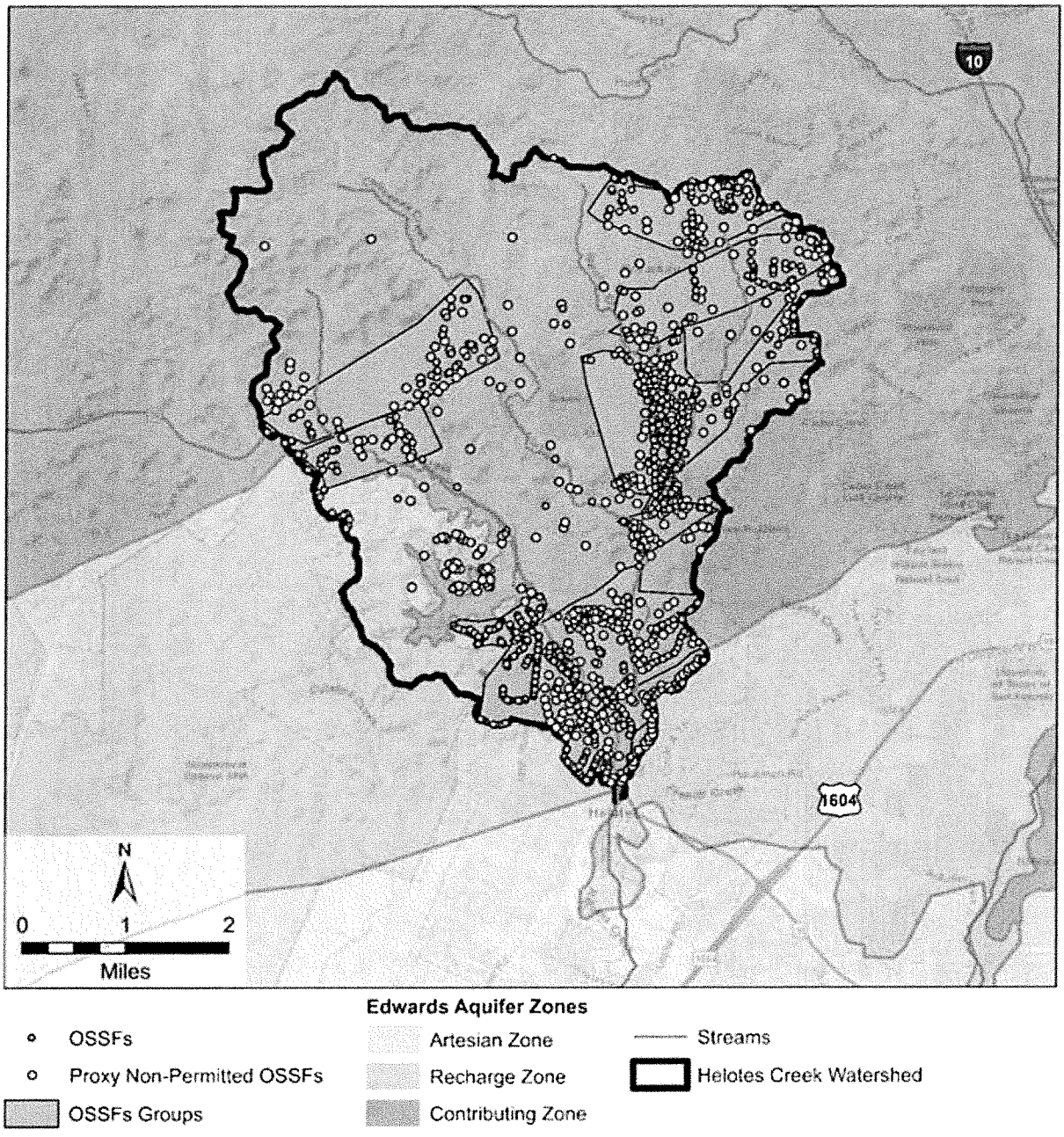

Figure 3-3 Map of permitted and proxy non-permitted OSSFs (Scenario 1).

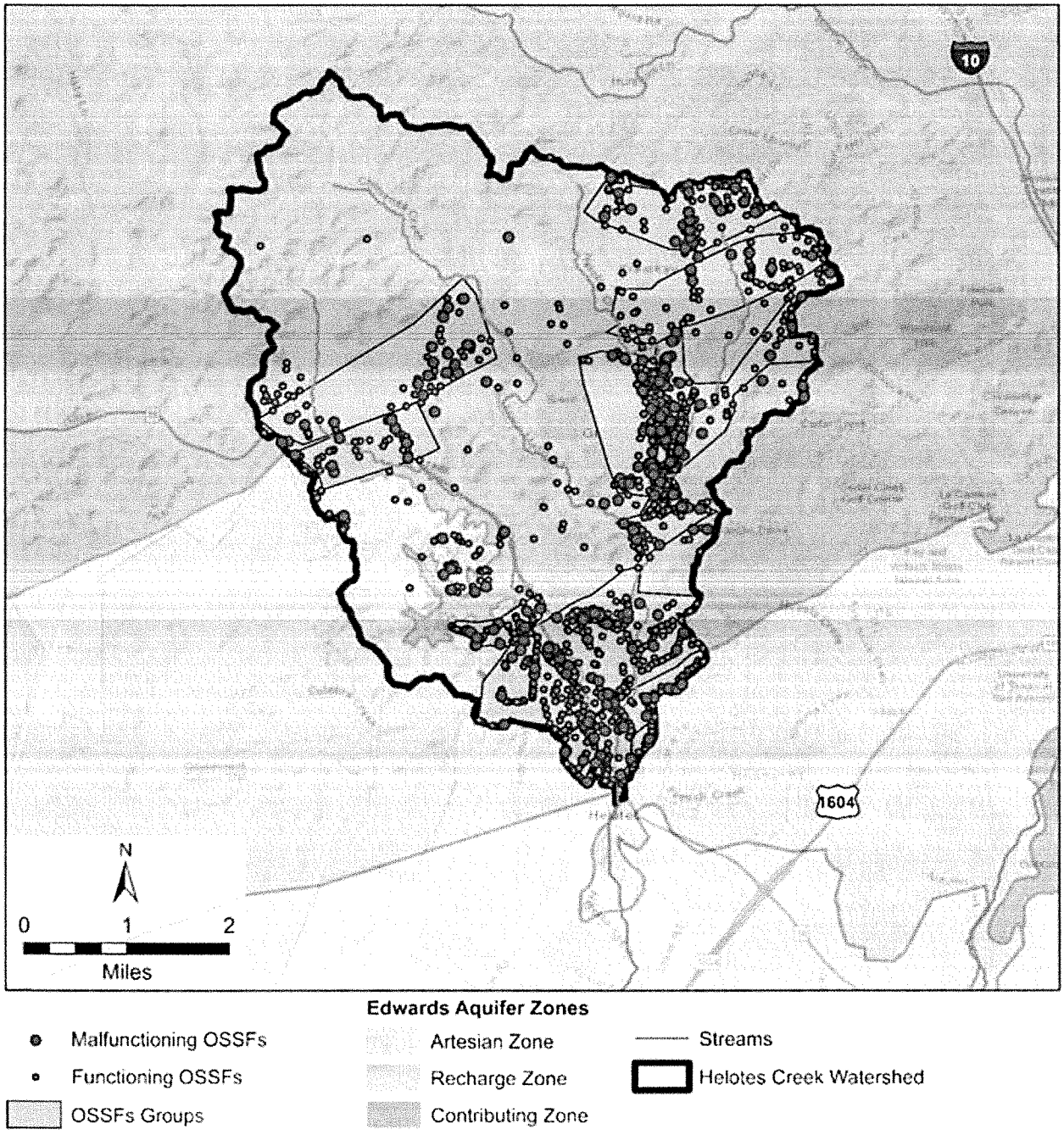

Figure 3-4 Depiction of operational and malfunctioning OSSFs in the Helotes Creek watershed (Scenario 2).

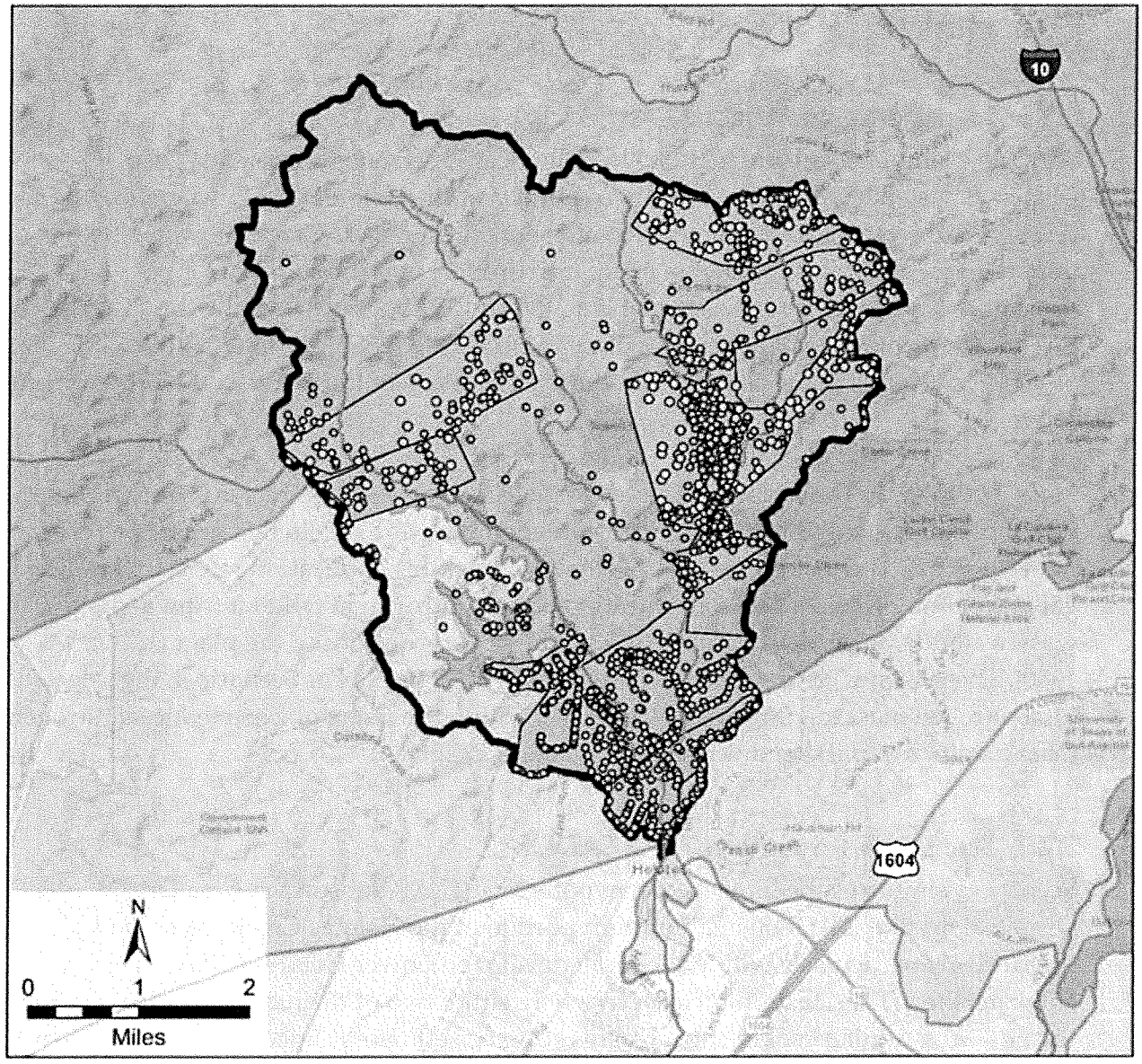

Figure 3-5 Depiction of existing OSSFs and projected example locations for new OSSFs in 5 years (Scenario 3).

3.2 TLAP Scenarios

3.2.1 Scenario 4 – Northern TLAP SADDS

Scenario 4 simulates the impacts of a hypothetical TLAP Subsurface Area Drip Dispersal System (SADDS) in a northern portion of the Helotes Creek watershed **(Figure 3-6)**, particularly within the less developed Chimenea Creek subwatershed. In this scenario, effluent is injected no deeper than 4 feet into the subsurface (per regulatory standards) over 32 acres of land (30 TAC §222). Furthermore, the TLAP in this location would hypothetically replace the OSSFs in OSSF groups 8 and 9, while the other OSSF groups in the eastern and southern portions of the watershed would remain active.

Mass loading is to the surface of the water table. The application rate is 0.1 gal/ft^2/day, which comports with the maximum permitted application rate in this region of Texas (30 TAC §222). The maximum flow for the facility at this application rate is 0.14 million gallons per day (MGD). The concentration of total nitrogen in effluent from a given wastewater disposal plant varies based on the process designs of the plant (U.S. EPA, 1980). These values can range from 5 mg/L to over 35 mg/L. For Scenario 4, the selected total nitrogen mass loading is set at 20 mg/L, within the range of expected total nitrogen mass loadings of packaged wastewater disposal facility.

3.2.2 Scenario 5 – Southern TLAP SADDS

Scenario 5 simulates the impacts of a hypothetical TLAP Subsurface Area Drip Dispersal System (SADDS) in a southern portion of the Helotes Creek watershed (**Figure 3-7**), particularly within the more developed Lower Helotes Creek subwatershed. This location is closer to where either two of the recharge processes into the Edwards Aquifer would occur. In this scenario, effluent is injected no deeper than 4 feet into the subsurface (per regulatory standards) over 13 acres of land. Furthermore, the TLAP in this location would hypothetically replace the OSSFs in OSSF group 2, while the other OSSF groups in the watershed would remain active.

Mass loading is to the surface of the water table. The application rate is 0.1 gal/ft^2/day, which comports with the maximum permitted application rate in this region of Texas (30 TAC §222). The maximum flow for the facility at this application rate is 0.05 million gallons per day. The concentration of total nitrogen in effluent from a given wastewater disposal facility varies based on the process designs of the plant (U.S. EPA, 1980). These values can range from 5 mg/L to well over 35 mg/L. For Scenario 5, the selected total

nitrogen concentration is 20 mg/L which is within the range of expected total nitrogen concentrations in effluent from packaged wastewater disposal facility.

3.2.3 Scenario 6 – Northern TLAP SS

Scenario 6 simulates the impacts of a hypothetical TLAP Surface Spray/Irrigation (SS) facility in a northern portion of the Helotes Creek watershed (**Figure 3-6**), such as the less developed Chimenea Creek subwatershed. In this scenario, effluent is applied over a 32-acre land surface (e.g., irrigation field). Furthermore, the TLAP at this location would hypothetically replace the OSSFs in OSSF groups 8 and 9, while the other OSSF groups in the eastern and southern portions of the watershed would remain active.

Mass loading is split between runoff and the water table. The application rate is 0.060 gal/ft^2/day, which is within the range of application rates of similar facilities in other areas of the Texas Hill Country (30 TAC §309). The maximum flow for the facility at this application rate is 0.86 million gallons per day. The concentration of total nitrogen in effluent from a given wastewater disposal facility varies based on the process designs of the plant (U.S. EPA, 1980). These values can range from 5 mg/L to well over 35 mg/L. For Scenario 6, the selected total nitrogen mass loading concentration is 20 mg/L, which is within the range of expected total nitrogen concentrations in effluent from packaged wastewater disposal facilities.

3.2.4 Scenario 7 – Southern TLAP SS

Scenario 7 simulates the impacts of a hypothetical TLAP Surface Spray/Irrigation facility in a southern portion of the Helotes Creek watershed (**Figure 3-7**), notably within the more developed Lower Helotes Creek subwatershed. In this scenario, effluent is applied over a 13-acre land surface (e.g., irrigation field). Furthermore, the TLAP at this location would hypothetically replace the OSSFs in OSSF group 2, while the other OSSF groups in the watershed would remain active.

Mass loading is split between runoff and the water table. The application rate is 0.060 gal/ft^2/day, which is within the range of application rates of similar facilities in other areas of the Texas Hill Country (30 TAC §309). Maximum flow for the facility is 0.34 million gallons per day. The concentration of total nitrogen in effluent from a given wastewater disposal facility varies based on the process designs of the plant (**Figure 3-7**). These values can range from 5 mg/L to well over 35 mg/L. For Scenario 7, the selected total nitrogen concentration is 20 mg/L, within the range of expected total nitrogen concentrations in effluent from packaged wastewater disposal facilities.

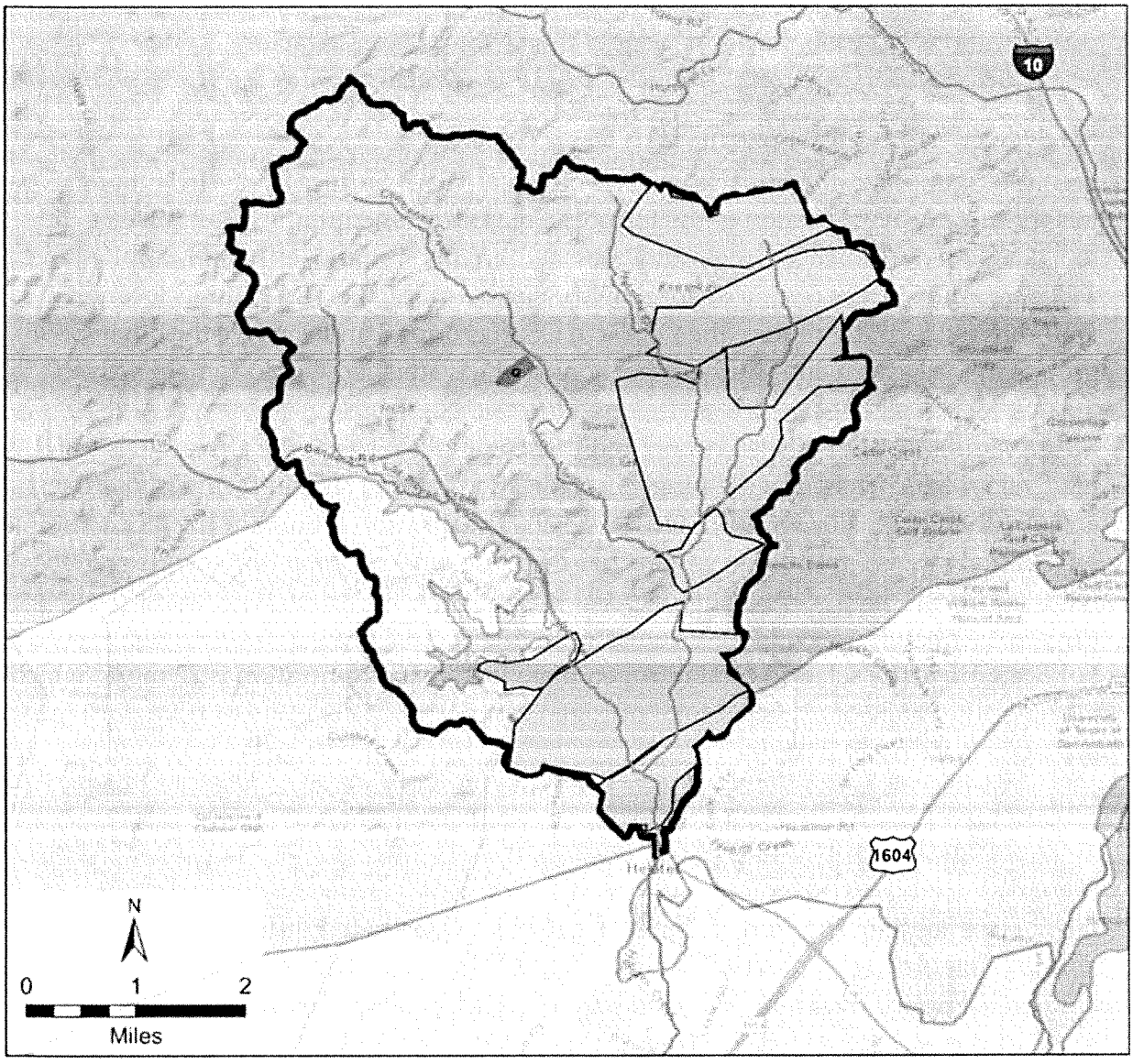

Figure 3-6 Map depicting location of northern TLAP facility location for Scenarios 4 and 6.

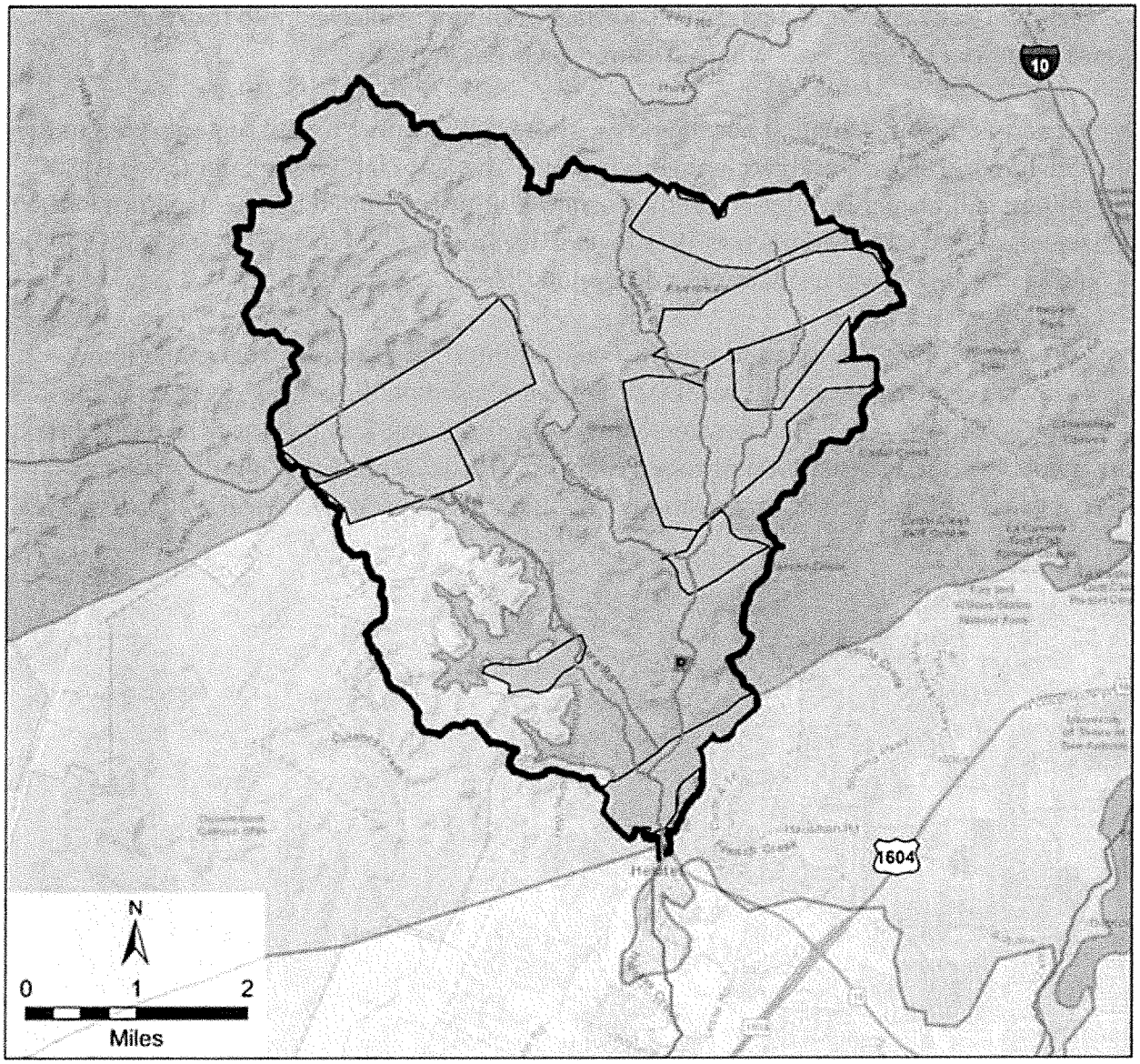

Figure 3-7 Location of TLAP facility for Scenarios 5 and 7.

3.3 TPDES Scenarios

3.3.1 Scenario 8

Scenario 8 simulates the impacts of a hypothetical TPDES in a southern portion of the Helotes Creek watershed (**Figure 3-8**), particularly within the more developed Lower

Helotes Creek subwatershed. In this scenario, effluent is released into the nearest segment of Helotes Creek where stream flow is perennial.

Scenario 8 assumes that all households within OSSF group 2 would be connected to the TPDES for wastewater treatment and disposal. The assumed wastewater flow is 0.80 million gallons per day, based on the permitted flows of similar TPDES facilities in the region, such as the Bridgewood Wastewater Treatment Plant located in the Leon Creek subwatershed which is adjacent to the Helotes Creek watershed.

All mass loading is applied to runoff. The concentration of total nitrogen in effluent from a given wastewater disposal facility varies based on the process designs of the plant (U.S. EPA, 1980). These values can range from 5 mg/L to well over 35 mg/L. For Scenario 8, the selected total nitrogen concentration is 20 mg/L, within the range of expected total nitrogen concentrations of effluent from packaged wastewater disposal facilities.

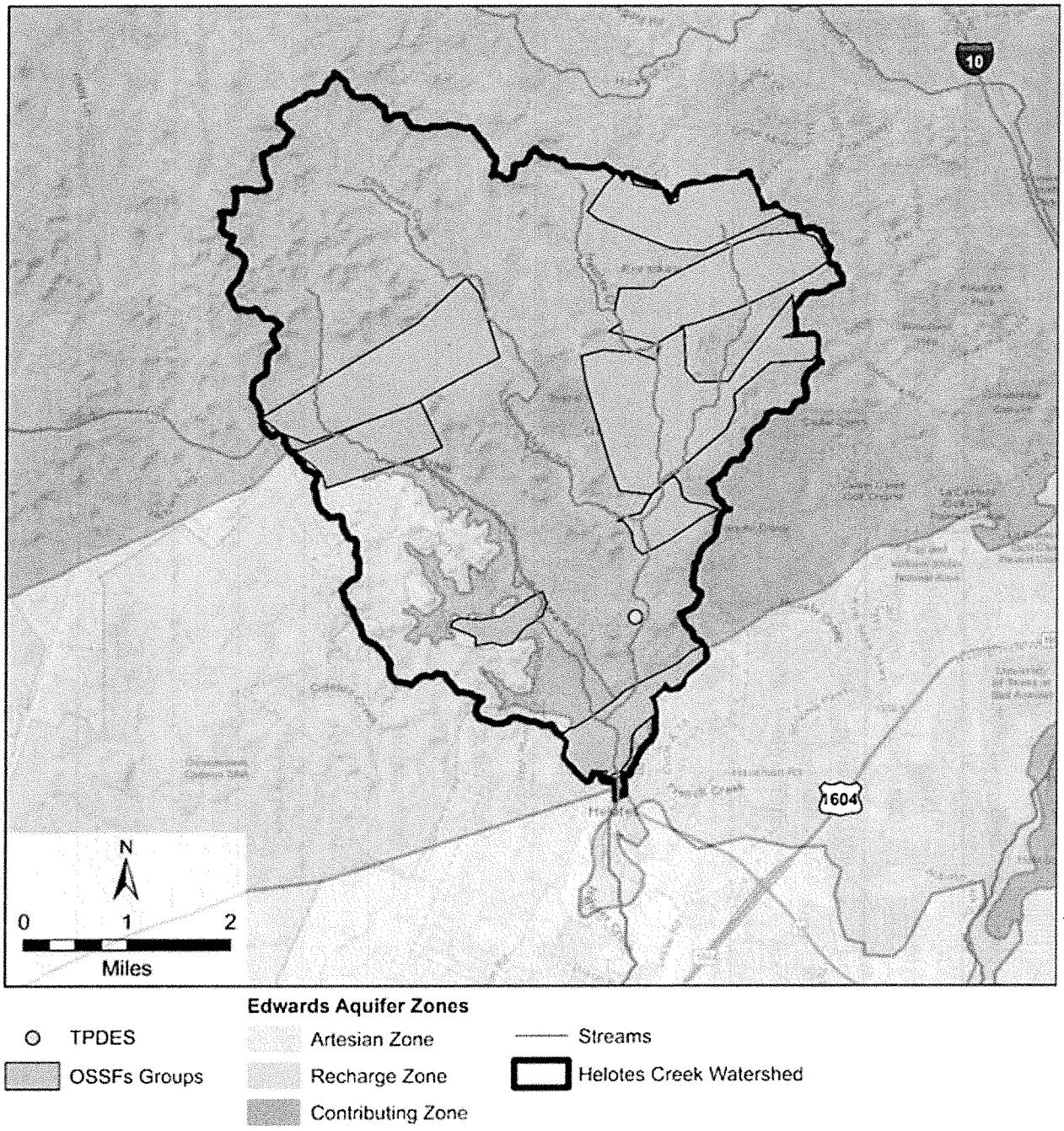

Figure 3-8 Location of hypothetical TPDES facility (Scenario 8).

Table 3-2 Wastewater facility scenarios according to wastewater disposal method.

Treatment Method		Scenario	Summary	Mass Loading	Total Nitrogen Concentration	Total OSSFs	OSSFs (MGD)	TLAP/ TPDES (MGD)	Total Flow (MGD)
OSSF		BC	Permitted OSSFs	Water table	40 mg/L	1412	0.25	-	0.25
		1	Permitted and proxy Non-Permitted OSSFs	Water table	40 mg/L	1627	0.29	-	0.29
		2	13% Malfunctioning OSSFs	Water table	40 mg/L (1,685 functioning OSSFs) 80 mg/L (252 malfunctioning OSSFs)	1412	0.25	-	0.25
		3	Year 2024 Projected Growth	Water table	40 mg/L	1516	0.27	-	0.27
TLAP	SADDS	4	Northern part of watershed	Water table	20 mg/L	1255	0.23	0.14	0.37
		5	Southern part of watershed	Water table	20 mg/L	1080	0.19	0.05	0.24
	Surface Spray/Irrigation	6	Northern part of watershed	Runoff and water table	20 mg/L	1255	0.23	0.86	1.09
		7	Southern part of watershed	Runoff and water table	20 mg/L	1080	0.19	0.34	0.53
TPDES		8	Southern part of watershed	Runoff	20 mg/L	1080	0.19	0.80	0.99

4 Implementation

While there has been considerable effort to model groundwater flow in the Edwards Aquifer and associated aquifers, an integrated surface-water/groundwater model and an associated solute-transport model within the San Antonio segment of the Edwards Aquifer is lacking. Here we present an integrated hydrologic transport representation that provides the means to simulate solute transport and evaluate the scenarios needed for wastewater disposal facility evaluation. A hydrogeological framework model based on previous work by Ferrill et al. (2005) and Clark et al. (2016) served as the basis for the integrated hydrologic transport representation. The project team developed an integrated surface-water/groundwater model using GSFLOW software (https://water.usgs.gov/water-resources/software/gsflow/GSFLOW_Release_Notes_2.1.0.pdf) that links the watershed model PRMS-IV (https://water.usgs.gov/water-resources/software/PRMS/release_notes_prms_5.0.0.pdf) and the groundwater model MODFLOW 2005 (https://water.usgs.gov/water-resources/software/MODFLOW-2005/release.txt). Results from integrated hydrologic modeling were used in tandem with MODPATH 7 software (https://water.usgs.gov/water-resources/software/MODPATH/release.txt) and ZONEBUDGET software (Harbaugh, 1990) to determine flow pathways and volumetric flow rates for input to a transport model developed with GoldSim 12.1 (https://www.goldsim.com/). This model assembly provides a valuable tool to target which wastewater disposal facility types and locations pose the greatest risks to degradation of recharge to the Edwards Aquifer.

4.1 Framework Model Implementation

This study relied on refined geologic and hydrostratigraphic studies of the Edwards and Trinity aquifers in Bexar County (Clark et al., 2016) during framework model development. The methodology employed to develop the geologic framework model using the Petrel software package (https://www.software.slb.com/products/petrel) is described in Appendix B. Average thicknesses of model layers, surface topography, and well control were incorporated into the Petrel model. The geologic framework model in Petrel provided the basis for hydrologic framework development and stratigraphic data implementation. The construction of the geological framework model provided two-dimensional surfaces of top elevations of hydrostratigraphic units. A total of 41 normal faults mapped in the area were included in the geologic framework model. The faults were assumed to cut each horizon in the model domain, with fault offsets estimated based on the mapping of Clark et al. (2016).

Point representations of stratigraphic picks exported from the Petrel geologic framework model were used to develop the hydrologic framework model. Specifically, Triangular Irregular Networks (TINs) of formation top elevations in the model domain were created to provide 3-D volumes that could be directly mapped onto the MODFLOW grid.

The ground surface of the hydrologic framework model was constrained using the digital elevation model (DEM) (Section 2.5.3). Surfaces of formation-top elevations were created for the Hensell, Honey Creek, Lower Glen Rose, Evaporite/Fossiliferous, Camp Bullis, Cavernous, Kainer, Lower Person, Upper Person, Georgetown, Del Rio, Buda, and Austin/Eagle Ford hydrostratigraphic units using stratigraphic pick interpretations (see Appendix B). Thirteen stratigraphic layers are represented in the model domain and honor the refined hydrostratigraphic interpretations in the study area made by Clark et al. (2016)

A solids model was pre-assembled in Esri ArcGIS 10.5 (https://www.esri.com/en-us/arcgis/about-arcgis/overview) using the hydrostratigraphic layers to provide visualization of conceptual model development and confirmation and visualization of model results. The solids model was created by extruding volumes between adjacent TIN surfaces to create a volumetric representation of the formation thicknesses. The TIN extrusions were laterally bounded by the polygons created from faults in the geologic framework model and exported to the hydrostratigraphic framework model. The resulting hydrologic framework model preserved fault vertical offset (throw) between layers, but simplified the dip of faults to be vertical. This simplification was necessary because the resolution of the groundwater model grid was too coarse to capture non-vertical dips. Moreover, this simplification was thought to be reasonable because it captures first order thinning of aquifer and aquitard units, juxtaposition relationships across faults, and displacement of stratigraphic units.

4.2 Integrated Hydrologic Modeling

The freely available, open source GSFLOW 2.0.0 integrated hydrologic modeling software was selected to model runoff, unsaturated zone flow, and saturated zone flow in the Helotes Creek watershed. Hydrologic modeling was necessary to quantitatively constrain the range of rates of transport from potential wastewater disposal sources in the Helotes Creek watershed to the Edwards Aquifer that might occur. Because potential transport pathways comprise interacting streams and groundwater, integrated hydrologic modeling software was necessary to consistently account for both stream characteristics and regional groundwater flow patterns. The ability to represent

coupled surface runoff and regional groundwater flow with the watershed model was critical to the effort to accurately simulate the hypothesized transport pathways to the Edwards Aquifer and account for feedbacks between surface water and groundwater. The integrated hydrologic model implemented in GSFLOW is conceptually intermediate between the extremes of (i) simulating surface-water and groundwater balances with separate codes and (ii) simultaneously solving the independently complete set of surface-water and groundwater equations with a fully-coupled code. GSFLOW uses two specialized and independent codes, PRMS-IV and MODFLOW, to address different parts of the overall water balance. PRMS 5.0.0 solves the water balance for runoff and water in the shallow soil zone, while MODFLOW 1.12.0 solves the water balance for flows in streams and lakes, the deeper unsaturated zone, and the saturated zone. GSFLOW ensures that PRMS and MODFLOW represent a fully-coupled and internally consistent hydrologic system by passing a consistent amount of water across the domain interface separating the two codes at every time step.

Model parameterization and calibration were separated into three steps. First, a standalone PRMS model was developed and parameterized for Helotes Creek watershed and calibrated independently using PEST 17.05 software (http://www.pesthomepage.org/Downloads.php#hdr1). Then, a MODFLOW model was developed and input files for both MODFLOW and PRMS were grouped in a directory structure suitable for GSFLOW. Additional PRMS input files for parameters pertaining to soil-zone characteristics and mapping between HRU's and MODFLOW finite-difference cells were created. GSFLOW-specific PRMS parameters were manually calibrated to ensure reasonable runoff and recharge rates. Finally, MODFLOW parameters were calibrated using PEST software and running the full GSFLOW model with PRMS and MODFLOW active.

4.2.1 PRMS-IV Model Implementation

Precipitation-Runoff Modeling Software (PRMS) IV is a surface-water model that is capable of simulating hydrologic response such as streamflow, evapotranspiration, and groundwater recharge in a watershed. A full description of the model including inputs and results can be found in the PRMS-IV Appendix.

The watershed was divided into 23 hydrologic response units (HRUs), as the smallest unit of the model. These HRU's are areas of the watershed that have uniform hydrologic responses. Helotes Creek watershed HRU's are segmented according to slope, vegetation type, elevation, and aspect. Model inputs include several time-series datasets. Precipitation, temperature, dew-point temperature, and vapor pressure were acquired from PRISM Climate Group (Section 2.5.1), which provides modeled climate

data for the conterminous United States. Surface shortwave radiation data were downloaded from the North American Land Data Assimilation System (NLDAS).

The model was calibrated to streamflow measurements from the Helotes Creek USGS gage 08181400 for close to a 3-year period, 01-01-2016 to 11-01-2018. The model was validated, or tested, over a 2-year period, 01-01-2014 to 12-31-2015. **Table 4-1** shows the percentage of rainfall in the system that partitioned into evapotranspiration, runoff to streamflow, and groundwater recharge.

Table 4-1 Components of the water balance normalized to rainfall over the calibration and validation periods.

Water Balance Components	Calibration	Validation
Actual Evapotranspiration	72.67%	77.10%
Recharge	13.48%	10.20%
Runoff	13.85%	12.60%

The model calibration is considered average, with simulated streamflow matching observed streamflow with an R^2 value of 0.58 over the calibration period and 0.614 over the validation period. **Figure 4-1** and **Figure 4-2** show the results of the streamflow calibration and validation.

The lack of detailed data specific to the Helotes Creek watershed is a limitation in the model. For instance, vegetation and soils inputs were mapped at a large scale with insufficient resolution to represent variation within the watershed. Also, a major assumption was that there was no withdrawal of streamflow for private usage. This is likely false, yet it was not possible or feasible to thoroughly examine the streams for evidence to the contrary. Additionally, karst features such as swallets or other discrete recharge features are not known nor were they accounted for in the model. This would explain why the model consistently over-predicts streamflow volumes at the gage as it is not able to account for streamflow losses. Overall, the calibrated PRMS model is considered adequate for the purpose of providing reasonable numerical representations of watershed properties in the integrated hydrologic model.

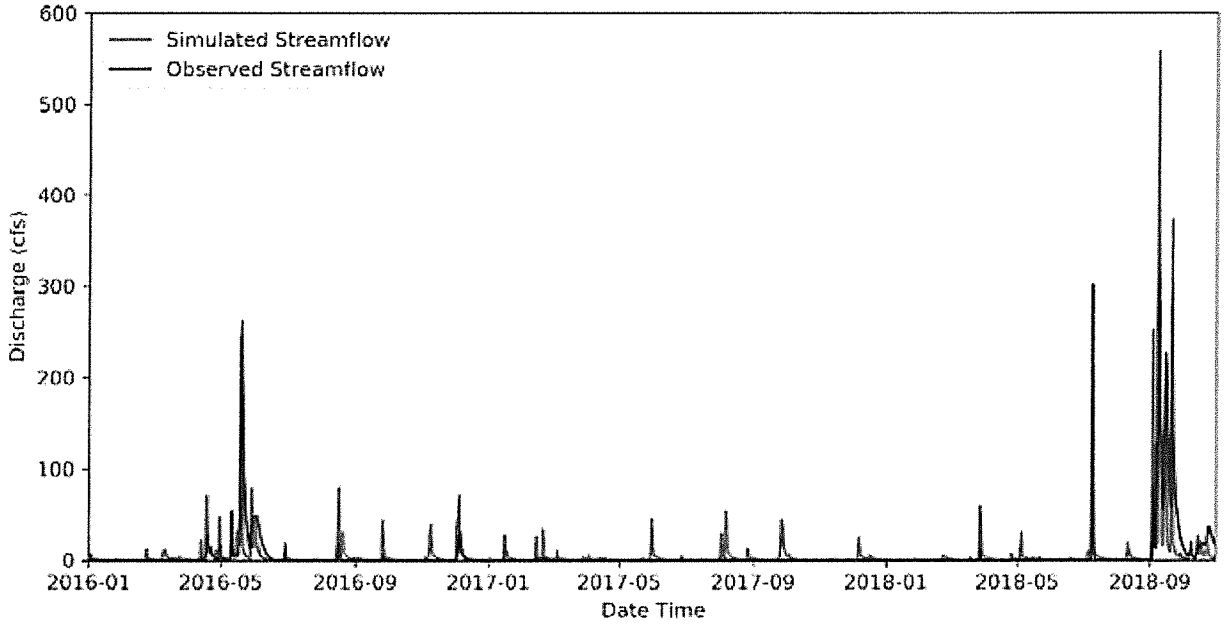

Figure 4-1 Observed and simulated discharge measured at Helotes Creek gage for the 3-year calibration period.

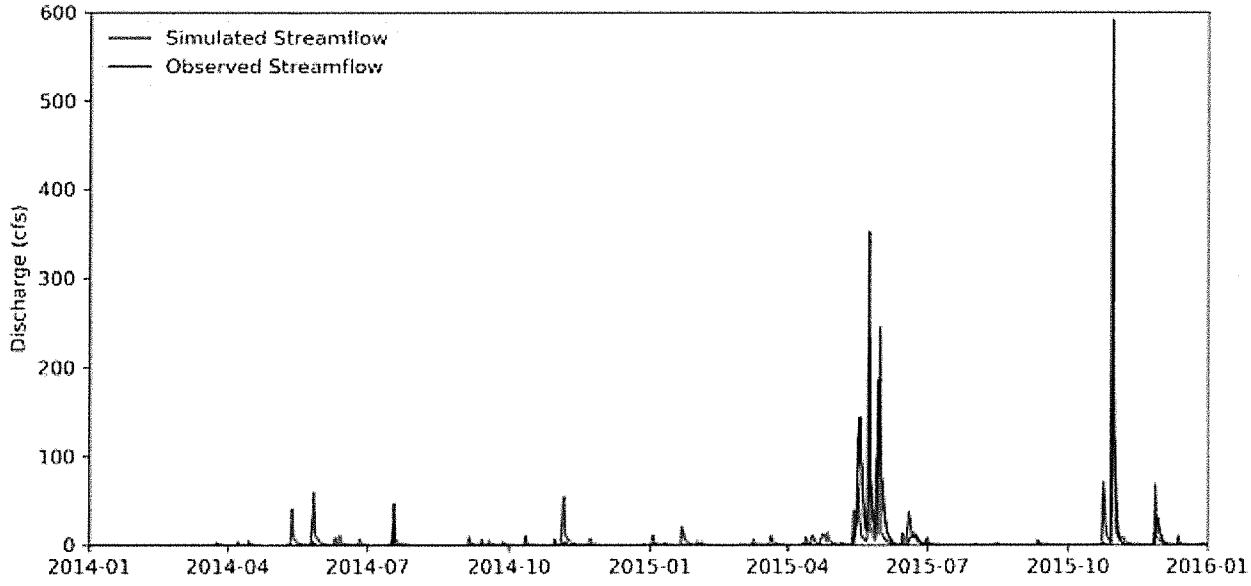

Figure 4-2 Observed and simulated discharge measured at Helotes Creek gage for the 2-year validation period.

4.2.2 GSFLOW Model Implementation

Previous groundwater models have been developed at a large scale for the San Antonio segment of the Edwards Aquifer. Lindgren et al. (2004) with the USGS and Lindgren (2006) created what is considered the original Edwards Aquifer groundwater model for the San Antonio segment using MODFLOW-2000. The 2004 version of the model used two hydraulic conductivity distributions to incorporate matrix and conduit flow to accommodate the karstic nature of the aquifer. The groundwater model developed by Lindgren (2006) was constructed without explicit regard for conduits and relied solely on diffuse flow. These two original Edwards Aquifer models were updated in the South-Central Texas TANC study (Lindgren et al., 2011) expanding the hydraulic conductivity parameterization in both the vertical and horizontal directions.

In 2015, LimnoTech attempted to adapt and link the 2004 MODFLOW (Lindgren et al., 2004) and the LBG-Guyton 2005 HSPF model to evaluate the benefits of the EAPP protected lands. They were able to implement the HSPF model but unable to link it with the groundwater model. This attempt also lacked implementation of solute-transport modeling. The study limited itself to reporting on the potential impacts of full development on land protected by the EAPP and compared the potential impacts to current development.

The primary goal in designing an integrated hydrologic model for Helotes Creek watershed was to accurately capture transport of solutes associated with wastewater into Edwards Aquifer receiving units. As such, model parameterization and calibration approaches prioritized constraining and accurately simulating conceptualized pathways. The integrated hydrologic model was developed in GSFLOW 2.1.0 (Regan & Niswonger, 2020). A full description of the model including inputs and results can be found in the GSFLOW Appendix.

Because most of the Helotes Creek watershed is located in the contributing zone of the Edwards Aquifer, flow pathways that first pass through Trinity units are important potential routes for solute delivery to the Edwards Aquifer. The only observation data available for calibration were target water levels in four Lower Glen Rose wells and stream gage data, so the only materials with calibrated hydrologic properties were the Lower Glen Rose throughout the model domain and the materials directly underlying stream reaches.

There are many faults within the model domain. The model does not represent faults as a unique material type, but faults are implicitly represented in the framework model in the form of offsets in material types. For example, the model allows for flow between

confined Trinity and confined Edwards units where these conductive units are juxtaposed at the Haby Crossing Fault, forming the primary entry zone into the confined Edwards units.

The Cavernous Glen Rose just upstream of the USGS gage is included in the model as a highly conductive losing reach, based on (i) wet and dry reaches observed in field surveys and (ii) gaining and losing reaches described in a literature review. The model represents this losing reach as the primary entry point for wastewater effluent discharged to streams to infiltrate into transmissive Trinity units upgradient of the Haby Crossing Fault.

Potential groundwater-transport pathways are delineated with subsurface particles tracked from postulated groundwater entry points to a surface discharge point or to the model boundary. Particle tracking was performed using the MODPATH 7.2.001 (United States Geological Survey, 2017) software with steady-state flows calculated by MODFLOW. Streamflow pathways are not explicitly represented; instead, particles are introduced to the groundwater at the stream bed in the losing reach of the Cavernous Glen Rose just upstream of the USGS gage.

Adding wastewater facilities to the Helotes Creek watershed alters the water budget to some extent, but the potential changes are installation-specific and any additional discharge water is likely to be small compared to the existing flows in the system. Therefore, even though additional discharge may cause local changes to the flow fields, the assumption is that these would not have such a large effect on flow fields in the streams and subsurface that the discharge point for the transport pathways would be significantly affected. This is reasonable because (i) the Helotes Creek watershed is small compared to the upstream recharge area for the transmissive Trinity units and (ii) flows during runoff events are much larger than postulated changes in surface releases. Accordingly, every transport scenario uses flow fields that are calculated with the current water budget.

4.2.3 Solute Transport from OSSF's

Mass loading from OSSF releases is applied to the subsurface directly beneath facilities. In our conceptual model, transport from OSSFs to the Edwards Aquifer is through a subsurface pathway, passing through transmissive hydrostratigraphic Trinity units into transmissive hydrostratigraphic Edwards units where the transmissive units are juxtaposed.

Land-surface areas with a high OSSF density were delineated with polygons. All OSSFs in the Helotes Creek watershed were assigned to a polygon based on proximity. MODPATH-tracked particles were released from every land-surface grid cell on the perimeter of each OSSF polygon, as well as all land-surface grid cells lying on selected grid rows and columns crossing through each polygon, using flow results from a steady-state simulation of the parameterized model. The set of calculated pathways represent the range of potential pathways for solute transport in the saturated zone.

Figure 4-3 shows the (i) OSSF areas, (ii) inflow zone extents for zone-budget analysis, and (iii) resulting flow pathways in plan view. Almost all paths eventual cross into the Edwards unit, with a few paths surfacing in Helotes Creek where the Cavernous Glen Rose is exposed in the reach immediately upstream of the stream gage location. Some of the stream discharge paths may reenter the subsurface in losing reaches further downstream, but MODPATH terminates tracking at the initial discharge point.

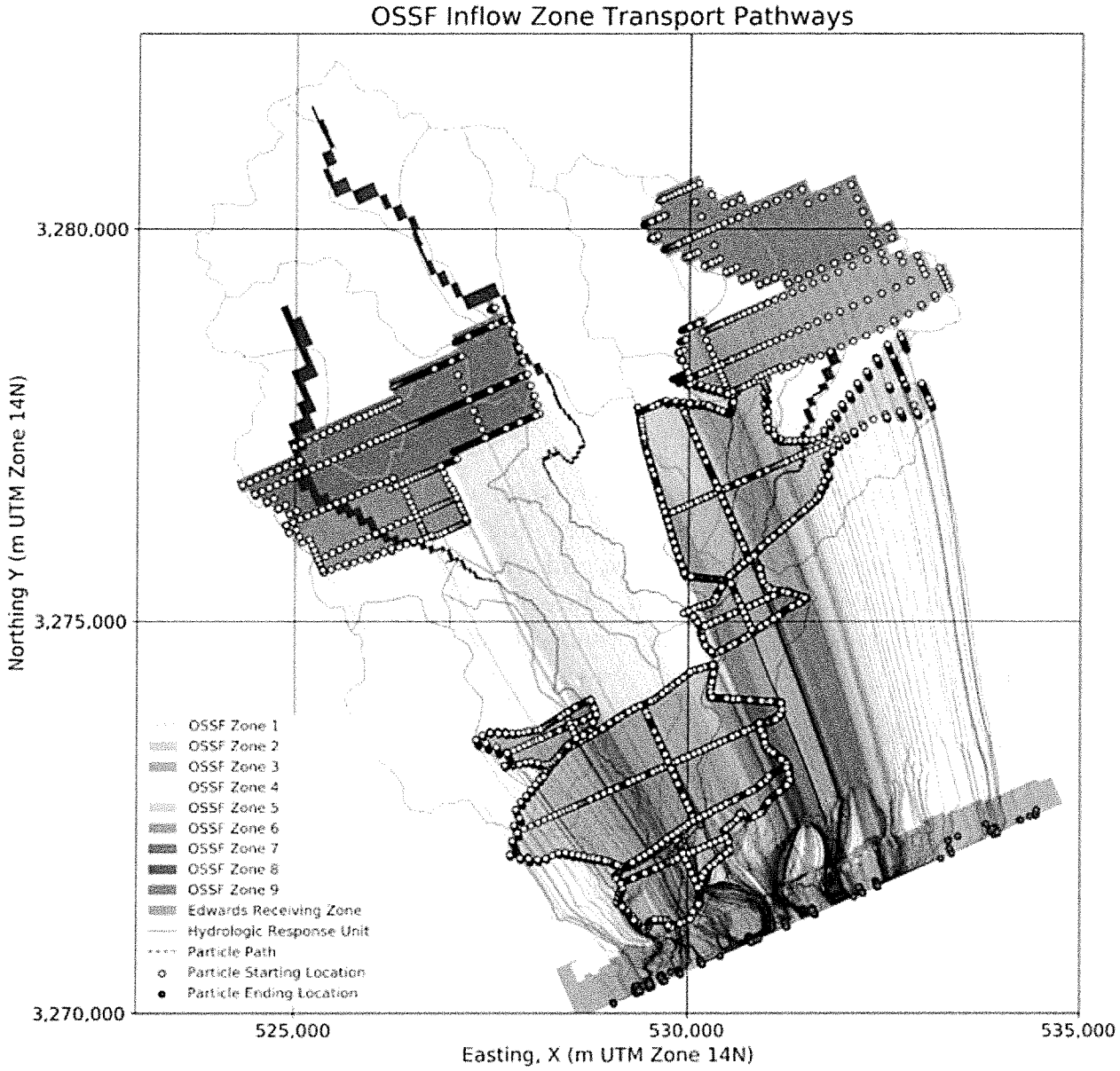

Figure 4-3 **Results of a MODPATH particle tracking simulation for OSSF Inflow Zones.**

Steady-state flows calculated by the parameterized integrated hydrologic model for the Helotes Creek watershed. OSSF regions that flow into the Western transport pathway are shown in red and those that flow into the Eastern transport pathway are shown in blue. The Edwards Aquifer receiving zone is shown in light purple. Particle transport pathlines are shown with faint black lines, with the particle starting and ending locations shown with yellow and blue circles, respectively.

4.2.4 Solute Transport from TLAP Facilities

Mass loading from TLAP facilities might occur as (i) injection into the shallow subsurface or (ii) aerial dispersal over the land surface. Both release scenarios were

simulated for two potential TLAP facility locations along stream reaches, using separate simulations for each facility and release scenario.

In all scenarios, the conceptualized pathway into the Edwards Aquifer is groundwater flow through transmissive hydrostratigraphic Trinity units that are juxtaposed with transmissive hydrostratigraphic Edwards units, but the entry mode to the Trinity units differs among scenarios. In the subsurface injection scenario, releases are modeled as direct injection into hydrostratigraphic Trinity units at the source location. In the aerial dispersion scenario, released solutes are first transported to streams as runoff, then the solutes infiltrate from the streambed along downstream losing stream reaches.

4.2.4.1 TLAP Subsurface Injection

Subsurface release is conceptualized as the result of vertical flow from the very shallow subsurface (~ 48 inches deep) to the aquifer. For each site, this process was represented as particle injection into the uppermost grid cell in each grid column within the hypothesized TLAP facility footprint. The collection of pathways in **Figure 4-4** suggests that regional flow would tend to carry subsurface releases into the Edwards Aquifer recharge zone.

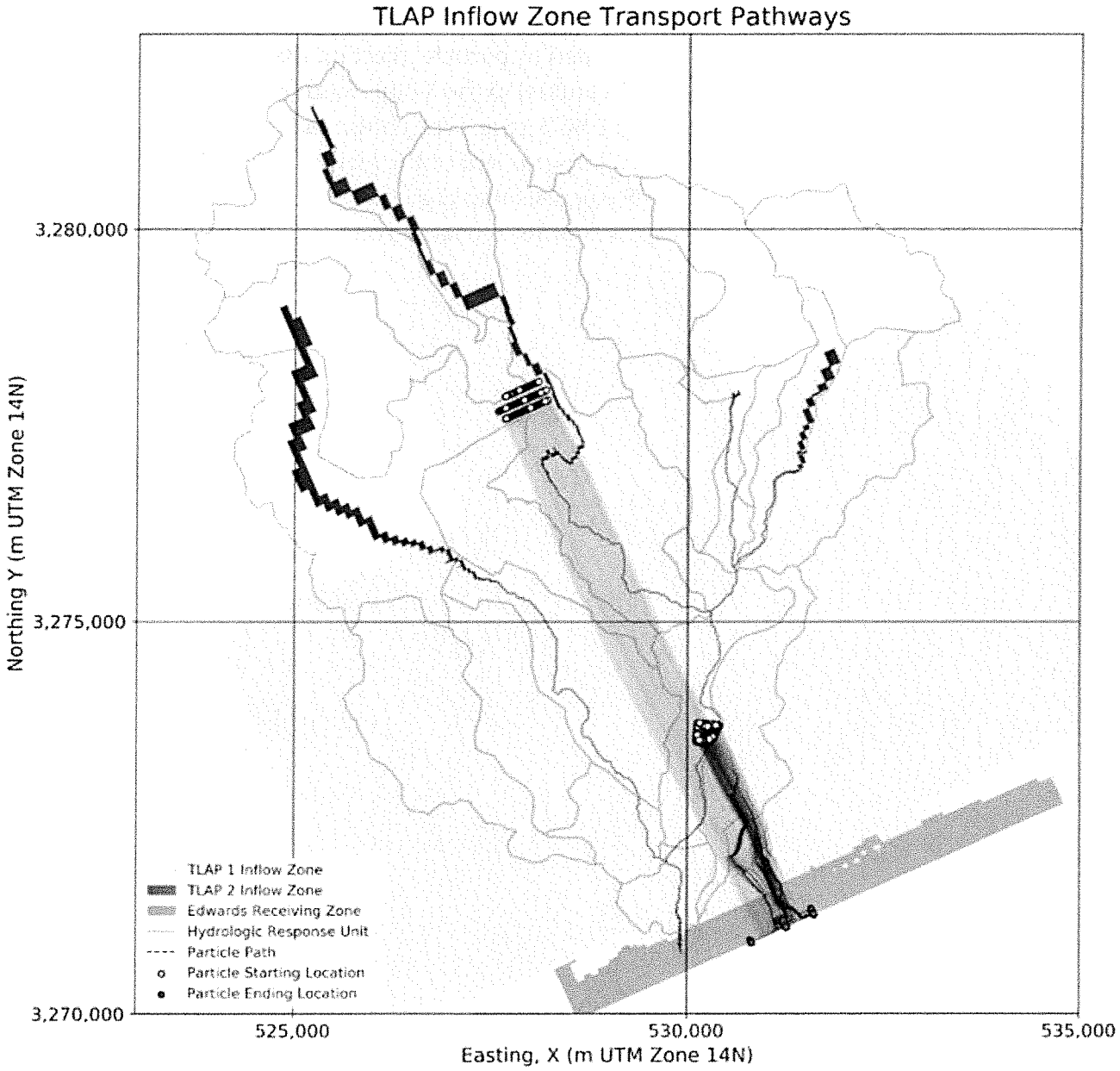

Figure 4-4 Results of a MODPATH particle tracking simulation for direct subsurface injection from TLAP facilities.

Steady-state flows calculated by the parameterized integrated hydrologic model for the Helotes Creek watershed. Both TLAP areas flow into the Western transport pathway. The Edwards Aquifer receiving zone is shown in light purple. Particle transport pathlines are shown with faint black lines, with the particle starting and ending locations shown with yellow and blue circles, respectively.

4.2.4.2 TLAP Aerial Dispersal

Subsurface release subsequent to TLAP aerial dispersal is conceptualized as the result of (i) runoff carrying solutes into streams, (ii) streamflow subsequently infiltrating into

the subsurface in losing reaches, (iii) direct infiltration to the surface at the point of application. This process was represented as particle injection into the uppermost grid cell in each grid column along the streambed in the losing reach where the Cavernous Glen Rose crops out upstream of the USGS gage. The collection of pathways represents the set of potential injection points, all upgradient of the Haby Crossing Fault. The collection of pathways in **Figure 4-5** suggests that regional flow would tend to carry subsurface releases into the Edwards Aquifer recharge zone.

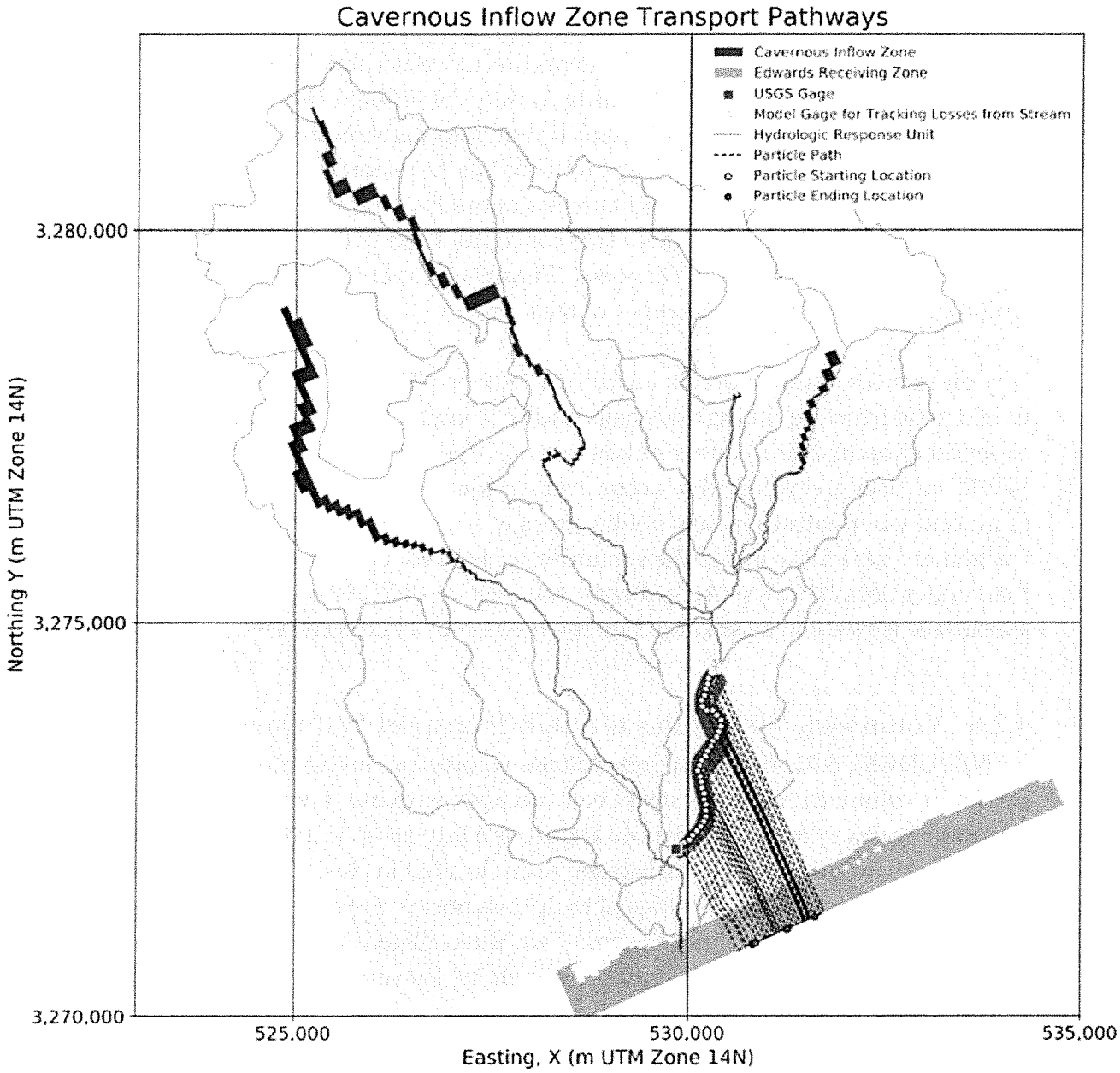

Figure 4-5 Results of a MODPATH particle tracking simulation for particles from TLAP facilities entering the Cavernous inflow zone.

Steady-state flows calculated by the parameterized integrated hydrologic model for the Helotes Creek watershed. The zone where cavernous material underlies the streambed that flows into the Western transport pathway is shown in red and the Edwards Aquifer receiving zone is shown in light purple. Particle transport pathlines are shown with faint black lines, with the particle starting and ending locations shown with yellow and blue circles, respectively.

4.2.5 Solute Transport from TPDES Facilities

TPDES facilities discharge treated effluent directly to streams during times of flow. The conceptualized pathway to the Edwards Aquifer for effluent from TPDES facilities is discharge directly to streams where infiltration into transmissive hydrostratigraphic Trinity units in the streambed occurs, followed by transport through transmissive hydrostratigraphic Trinity units that are juxtaposed with transmissive hydrostratigraphic Edwards units. This conceptualized pathway into the subsurface is similar to that of TLAP Aerial Dispersal (**Figure 4-5**); therefore, the MODPATH analysis would be identical for the two types of facilities.

Any differences in transport characteristics between TPDES facilities and TLAP facilities would arise from the timing and magnitude of loading to the stream. TLAP releases are expected to occur in infrequent pulses during large episodic runoff events, while TPDES releases are expected to occur over a wider range of flows. The spatial patterns of groundwater pathways may not be strongly affected by these differences, but the fraction of streamflow lost to the groundwater is likely to be smaller under high flows than under normal flows. Accordingly, the fraction of TLAP releases entering the subsurface is likely to be smaller than the fraction of TPDES releases.

4.2.6 Volumetric Flow Rates through Transport Pathways

ZONEBUDGET 3.01 software (United States Geological Survey, 2009) was used to constrain volumetric flow rates between successive mixing reservoirs located along the transport pathway from each inflow zone to the Edwards Aquifer recharge zone. Many of the solute inflow zones identified above are located in close proximity to one another and thus share significant portions of their transport pathway to the Edwards Aquifer recharge zone with other inflow zones. Two three-dimensional combined transport pathways were identified that fully contain all inflow zones and enclose all modeled flow pathways from MODPATH analysis. Together, the two transport pathways account for the transport of all mass loading from Helotes Creek watershed to the Edwards Aquifer receiving body. Both transport pathways are illustrated in plan view in **Figure 4-6**.

The Western transport pathway is split into five mixing reservoirs: W1, W2, W3, W4, and W5. This pathway encloses the Cavernous Inflow Zone, both TLAP Facility Inflow Zones, and OSSF Inflow Zones 1, 2, 3, 8 and 9. The Eastern transport pathway is also split into five mixing reservoirs: E1, E2, E3, E4, and E5. This pathway encloses OSSF Inflow Zones 4, 5, 6, and 7. Inflow zones have a thickness of one layer and are located at the top cell in each vertical column with a positive head value in the steady state

simulation. Pathway zones were delineated using polygons in plan view, which were identified by the highest and lowest layers through which transport occurred in each zone. Each zone included all finite-difference cells with a positive head value in the steady-state simulation between the highest and lowest layer for each vertical column in the polygon. The Edwards Aquifer receiving body was delineated as all finite-difference cells south of the Haby Crossing Fault with an Edwards Formation material code. The connection of the final zone in each pathway (E1 and W1) with the Edwards Aquifer was forced by including the cells, within a given layer, between the final pathway zone and the Edwards Aquifer material zone as part of the final pathway zone. The vertical extent of inflow zones and the pathway zones for both pathways are detailed in **Figure 4-7.**

ZONEBUDGET analyses with these zones were executed for the three-year period from January 1st, 2013 – December 31st, 2015. Net inflows to and between each reservoir were calculated at monthly time steps and used to inform transport modeling.

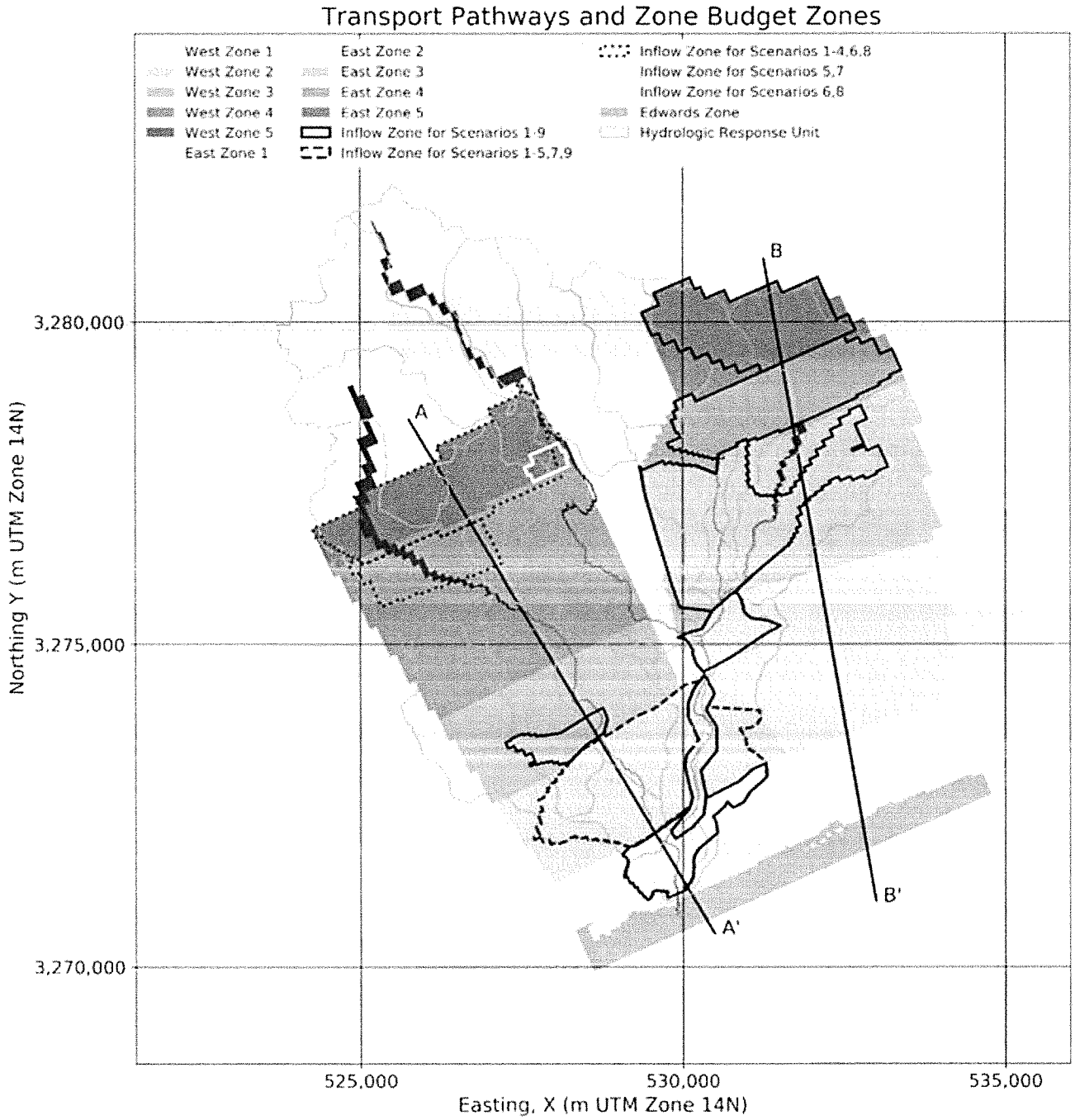

Figure 4-6 Budget zones delineating Western and Eastern transport pathways as determined from MODPATH particle tracking analysis.

The transport zones encompassing the Western transport pathway are shown in red and transport zones encompassing the Eastern transport pathway are shown in blue. Inflow zones from OSSF's, TLAP facilities and stream infiltration through transmissive Cavernous material are shown with solid, dashed or dotted black and white outlines to indicate which scenarios they correspond to. The Edwards Aquifer receiving zone is shown in light purple. Sections for cross-section lines A-A' and B-B' are shown in Figure 4-7

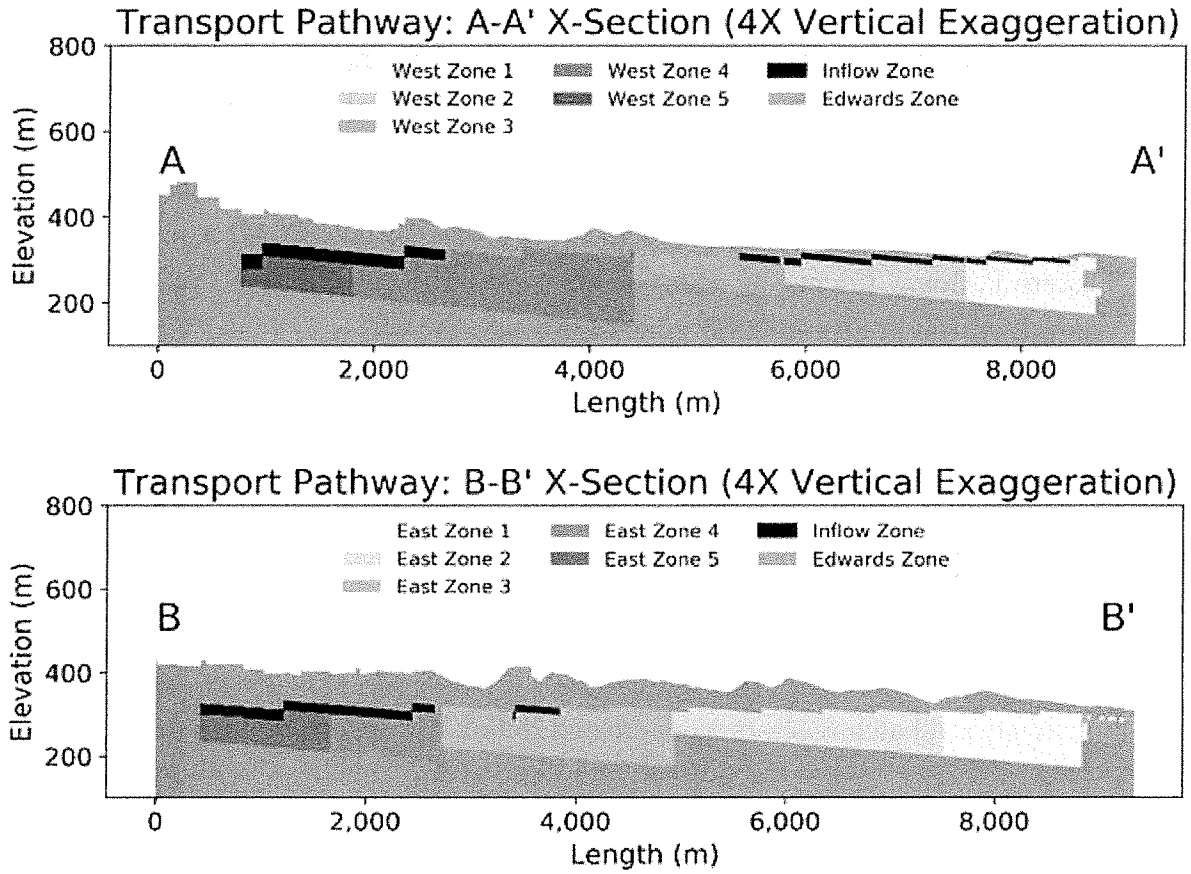

Figure 4-7 Cross-sections detailing the vertical extent of inflow and transport budget zones in the Western (A, red) and Eastern (B, blue) transport pathways.

The inflow budget zones are shown in black. The Edwards receiving zone is shown in light purple.

4.3 Transport Model Implementation

Previous work in similar watersheds regarding environmental impact modeling has been conducted by the City of Austin, utilizing the Water Quality Analysis Simulation Program (WASP), a U.S. Environmental Protection Agency program to assess potential water-quality impacts of proposed wastewater disposal facilities. The model allows for simulations of nutrient loading into surface water and simulates the effect on the trophic state of Onion Creek (Richter, 2016).

GoldSim 12.1 was used to perform solute-transport simulations in lieu of a mechanistic advection-dispersion simulator. Given the scope of the project objectives and the limited understanding of conduit/diffusive flow in the karstic Trinity and Edwards aquifers, the use of GoldSim was determined to be justified.

A base model structure was created to simulate volume and mass flows between various containers. This base model is based on the current conditions in the Helotes Creek watershed. Within this base model several pathways and components were developed:

1. **Western Pathway** (including reservoirs corresponding to the GSFLOW model zones W1 through W5, OSSF zones 1, 2, 3, 8, and 9, and the TLAP zones)
2. **Eastern Pathway** (including reservoirs corresponding to the GSFLOW model zones E1 through E5 and OSSF zones 4 through 7)
3. **Cavernous** – a portion of the Helotes Creek stream segment, corresponding to the GSFLOW zone of the same name
4. **The quarry** south of the Helotes Creek watershed
5. **Edwards Aquifer recharge zone** (the point of analysis, not including the quarry)
6. **Edwards Aquifer artesian zone** (as a placeholder container to which all the flow from the model's recharge zone is directed)

Within each model component listed above, a series of reservoir elements serving as continuously-stirred batch reactors were created to link the different zones to correspond to the zones noted in **Figure 4-6** and **Figure 4-7**. A series of volume (water) and mass-batch reactors were created within each pathway in a form of mass-water pairing, due to the dependence of mass calculations on the volumes.

Average simulated flow values from the GSFLOW model were implemented to reflect flow between the different zones. Expression elements were incorporated to include the equations pertinent to the transport modeling, which are listed below.

Total OSSF effluent flow per polygon was determined by:

$$Eff_{OSSFs} = Eff_{standard} * n$$

where $Eff_{standard}$ is the assumed standard effluent flow issued from an OSSF (680 L/day) and n is the number of OSSFs estimated to be contained within the polygon. Mass rates loading to the OSSF zones were calculated by:

$$MR = C * Eff_{OSSFs}$$

where C is the assumed total nitrogen concentration in the OSSF effluent (40 or 80 mg/L) and Eff_{OSSFs} is the calculated effluent flow per OSSF zone.

Mass outflows from each OSSF reservoir were determined by:

$$M_{OSSFs,out} = (M_{OSSF}/V) * (V_{WR} + V_{OR})$$

where M_{OSSF} is the mass in the reservoir, V is the volume of the corresponding Volume reservoir, and V_{WR} and V_{OR} are the withdrawal rates and overflow rates of the corresponding Volume reservoirs, respectively.

Concentrations for the non-OSSF mass reservoirs were calculated from:

$$C_W = M_W/V_W$$

where M_w is the mass of the given reservoir and V_w is the volume of the corresponding Volume reservoir.

Mass outflows from each non-OSSF mass reservoir were determined by:

$$M_{W,out} = C_W * (V_{WR} + V_{OR})$$

The Cavernous pathway included additional equations to account for non-point mass loading of total nitrogen, particularly during stormflow. The general non-point loading equation considered for this purpose was based on an equation determined by Zhu and Glick (2017) for similar environments in the Austin area:

$$TN_{non-point} = -0.098 + 9.6957 * I$$

where I is the percent impervious cover of the study area, in this case the entire Helotes Creek watershed. The impervious cover for the Helotes Creek watershed estimated by the PRMS-IV model was ~3.72%. To account for the total mass loading to the runoff, the equation above was incorporated into the following equation:

$$TN_{non-point,HCW} = TN_{non-point} * R_{HCW}$$

where R_{HCW} is the average annual runoff estimated from the integrated flow model, at about 4.45 in/yr. The non-point total nitrogen concentration was determined by:

$$C_{TN,non-point} = \frac{TN_{non-point,HCW}}{(R_{HCW} * A)}$$

where A is the area of the Helotes Creek watershed.

The Quarry

The Quarry pathway does not have a corresponding GSFLOW zone and is represented solely in the GoldSim models as a plug-flow reactor pair. In order to account for the fact that streamflow from the Helotes Creek watershed usually only reaches the quarry and Edwards Aquifer recharge zone during and following storm events, a rating curve based on the USGS stream gage data was generated to select a likely gage height and streamflow rate that would be representative of storm conditions. In this case, 97.4 cfs was selected as a reasonable threshold for flow to make it down to the quarry area.

The recharge zone container was similar to the other pathways, with the reservoirs volume estimated by calculating the volume of the cells from the flow model that corresponded to units that form the recharge zone. Both the Cavernous and recharge zone pathways were equipped with Material Delay elements to account for their role as flow-through components for the Helotes Creek volume and mass to reach the artesian zone.

Recharge Zone and Artesian Zone

The recharge zone was selected as the point of analysis. Similar to the quarry, it is represented by a plug-flow reactor pair and was derived separately from the GSFLOW model. The outflows from the recharge zone were directed to an arbitrary artesian-zone reactor pair.

A separate GoldSim model was created for each of the solute-transport scenarios discussed in Section 3. The average simulated flows used for the Base Case model were updated accordingly to represent the different scenarios. Other modifications made to the Base Case model structure in order to accommodate Scenarios 1 through 8 are briefly described below. **Figure 4-8** through **Figure 4-11** are schematics representing the different models.

4.3.1 OSSF Scenarios

Scenarios 1 through 3 required simple modifications. For Scenario 1, the number of OSSFs for relevant OSSF reservoirs was updated to reflect the increase caused by the inclusion of potential non-registered OSSFs. Scenario 2 required accounting for 13% of the OSSFs as malfunctioning. This required updating the mass-rate equations to the following:

$$MR = (C_{OSSFs} * (Eff_{OSSFs} * 0.87)) + (C_{OSSF,malf} * (Eff_{OSSFs} * 0.13))$$

where C_{OSSFs} and $C_{OSSF,malf}$ are total nitrogen concentrations in the effluent of functioning and failing OSSFs, respectively; whereas 0.87 and 0.13 are the fractions of functioning and malfunctioning OSSFs per OSSF zone, respectively.

Scenario 3, like Scenario 1, simply required updating the number of OSSFs for the relevant OSSF reservoirs to reflect a 15% increase in the number of OSSFs due to increased population and development.

4.3.2 TLAP Scenarios

Developing the TLAP Scenarios (4 through 7) consisted of replacing specific OSSF reservoirs and their associated expression and data elements with the TLAP reservoirs and associated elements. For Scenarios 4 and 6, OSSF reservoirs 8 and 9 and their associated elements were replaced by a TLAP reservoir representing the northern TLAP. For Scenarios 5 and 7, OSSF reservoir 2 and its associated elements were replaced by a TLAP reservoir representing the southern TLAP. The TLAP surface spray Scenarios (6 and 7) also involved creation of additional elements to partition part of the effluent flow to the subsurface and part of the effluent flow to runoff.

4.3.3 TPDES Scenario

For Scenario 8, the elements associated with OSSF zone 2 were removed. Elements associated with the hypothetical TPDES facility were linked so that the flow would contribute to the Cavernous reservoir.

In order to determine the equilibrium or asymptotic values for mass loading, the model simulation settings were adjusted to run and report for 10,000 years at 10-year increments. However, given the limitations described in Sections 4.2, 5.1, and 7, this runtime is not meant to reflect the nature of transport rates or timing of mass transport.

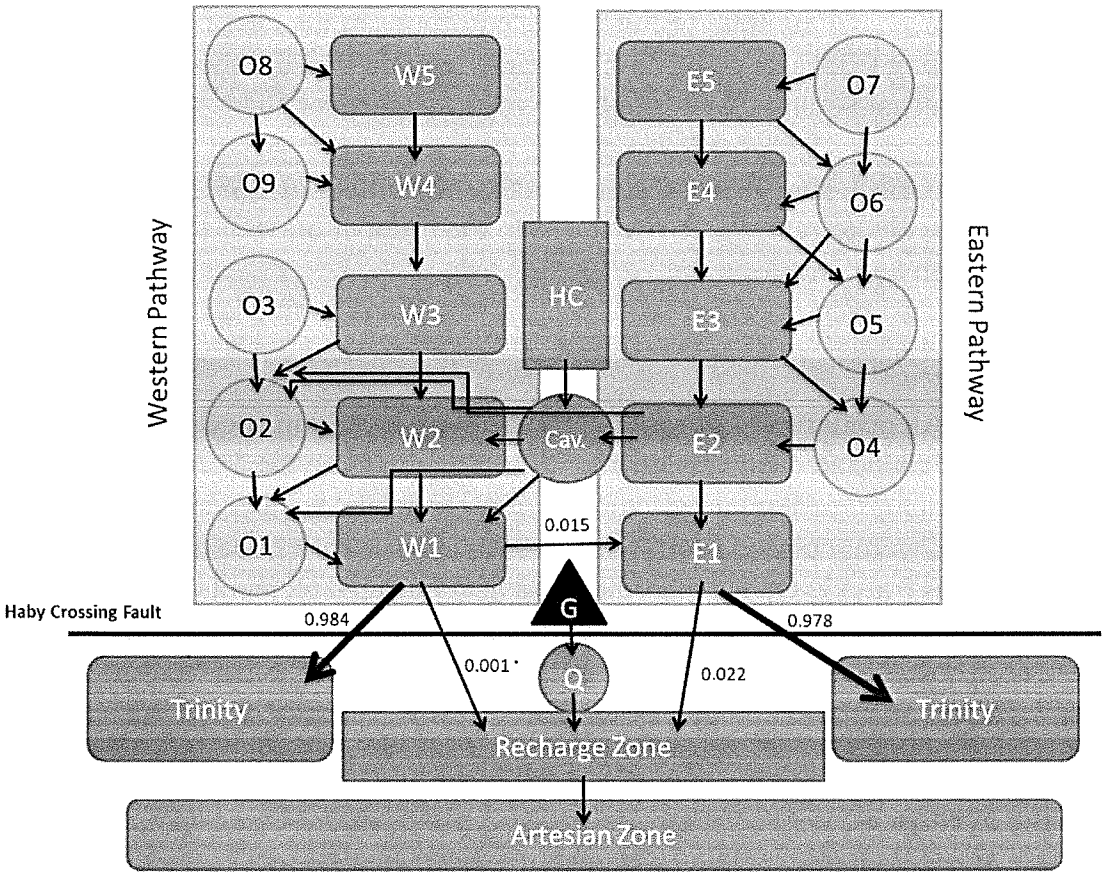

Figure 4-8 Infographic for Base Case and Scenarios 1 through 3.

Figure depicts flow within and from Western and Eastern pathways of the Helotes Creek watershed (noted by "W" and "E" elements) across Haby Crossing Fault (dark line) to the recharge zone; OSSF and TLAP reservoirs are noted by green circles, "HC" represents Helotes Creek, "Cav." represents the Cavernous stream valley, "G" represents the USGS gage, and "Q" represents the quarry; numbers on arrows from W1 and E1 indicate fractions of flow flowing to the different downstream reservoirs.

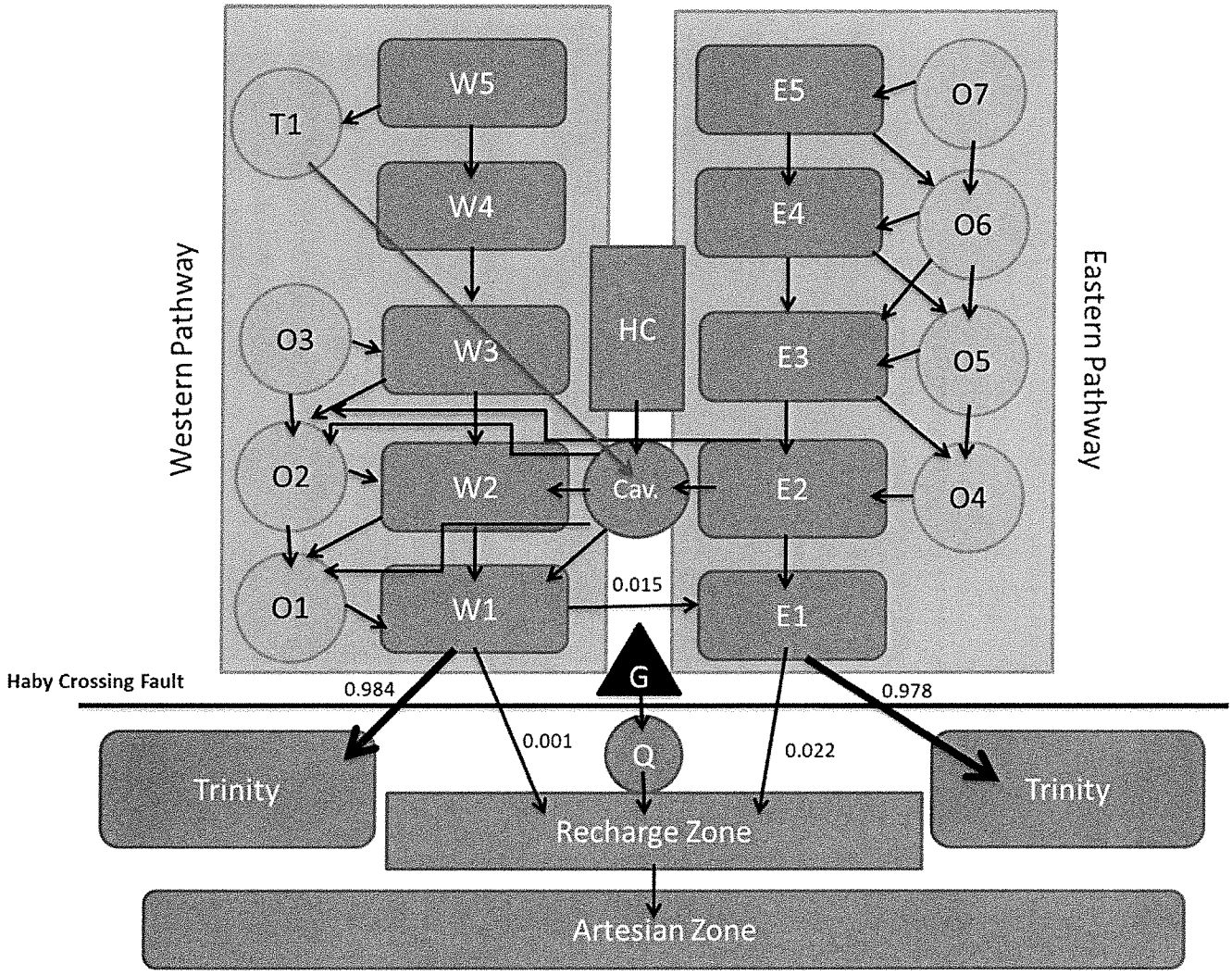

Figure 4-9 Infographic for Scenarios 4 and 6.

Figure depicts flow within and from Western and Eastern pathways of the Helotes Creek watershed (noted by "W" and "E" elements) across Haby Crossing Fault (dark line) to the recharge zone; OSSF and TLAP reservoirs are noted by green circles, "HC" represents Helotes Creek, "Cav." represents the Cavernous stream valley, "G" represents the USGS gage, and "Q" represents the quarry; the red arrow represents the TLAP effluent applied to runoff for Scenario 6; numbers on arrows from W1 and E1 indicate fractions of flow flowing to the different downstream reservoirs.

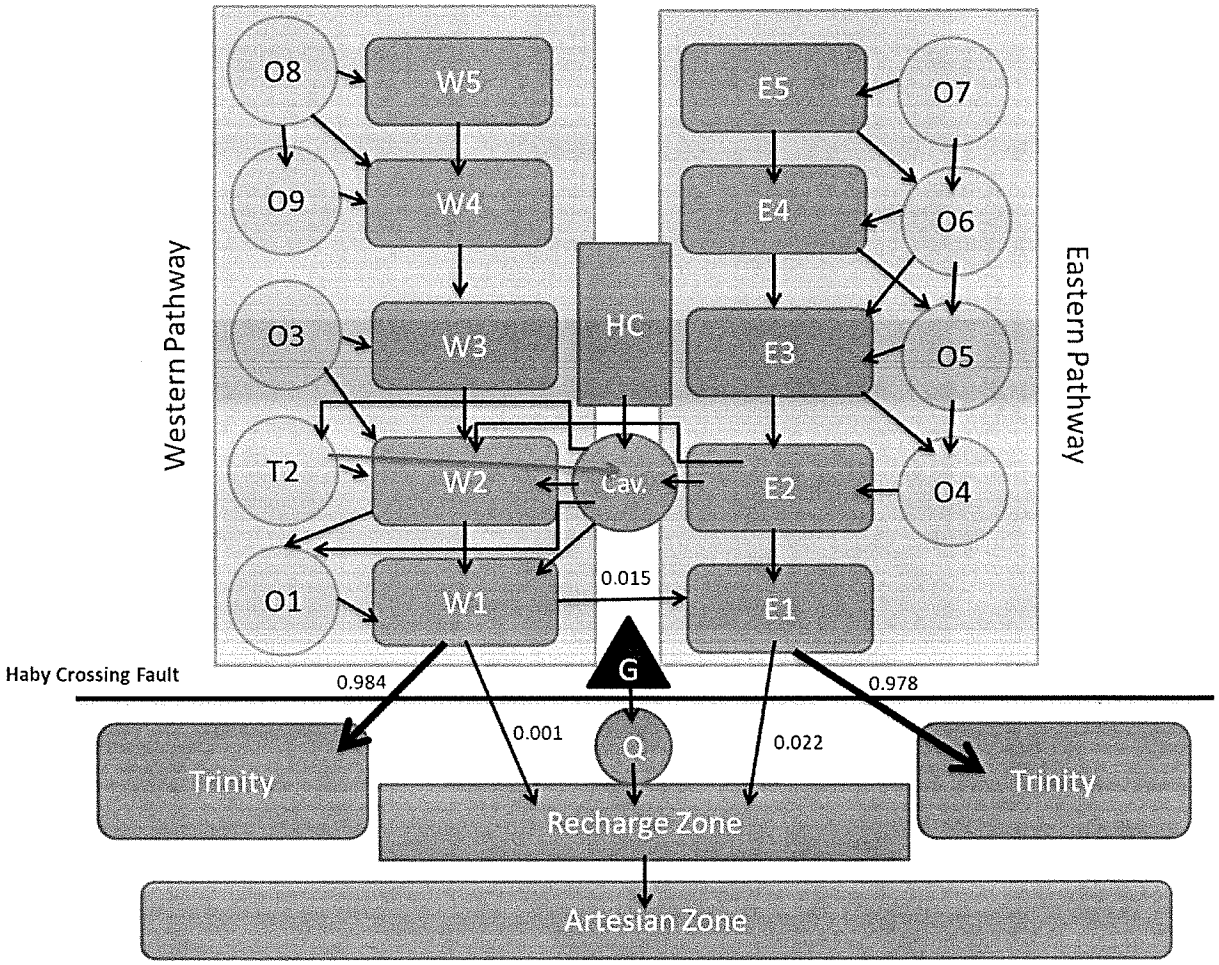

Figure 4-10 Infographic for Scenarios 5 and 7.

Figure depicts flow within and from Western and Eastern pathways of the Helotes Creek watershed (noted by "W" and "E" elements) across Haby Crossing Fault (dark line) to the recharge zone; OSSF and TLAP reservoirs are noted by green circles, "HC" represents Helotes Creek, "Cav." represents the Cavernous stream valley, "G" represents the USGS gage, and "Q" represents the quarry; the red arrow represents the TLAP effluent applied to runoff for Scenario 6; numbers on arrows from W1 and E1 indicate fractions of flow flowing to the different downstream reservoirs.

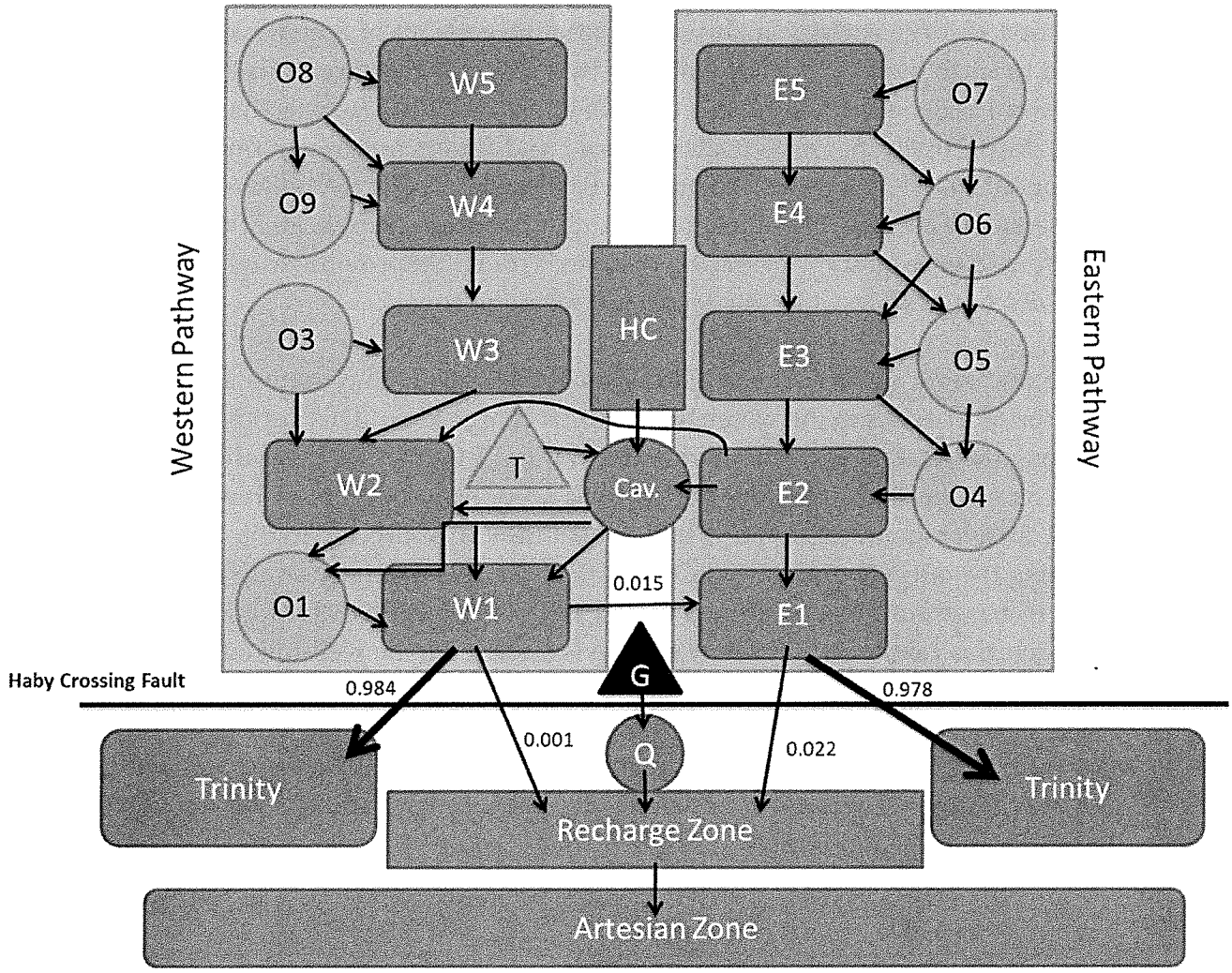

Figure 4-11 Infographic for Scenario 8.

Figure depicts flow within and from Western and Eastern pathways of the Helotes Creek watershed (noted by "W" and "E" elements) across Haby Crossing Fault (dark line) to the recharge zone; OSSF and TLAP reservoirs are noted by green circles, "HC" represents Helotes Creek, "Cav." represents the Cavernous stream valley, "G" represents the USGS gage, and "Q" represents the quarry; numbers on arrows from W1 and E1 indicate fractions of flow flowing to the different downstream reservoirs.

4.3.4 Sensitivity Analyses

Sensitivity analyses for the solute-transport modeling focused on two aspects of the models:

1. Effluent loadings and flows
2. Flow from the final watershed transport zones (W1 and E1) to the recharge zone

In the first set of sensitivity analyses, the baseline versions of Scenarios 4 and 5 were altered twice to increase the effluent flow by a factor of two. Scenario 4 alternatives 1 and 2 were assigned effluent flows of 0.560 and 0.280 MGD (versus the original 0.14 MGD), respectively. Scenario 6 alternatives 1 and 2 were assigned effluent flows of 0.100 and 0.200 MGD (versus the original 0.05 MGD), respectively. These alternatives represent extreme cases in which the maximum permitted application rate of 0.1 gal/ft^2/day is exceeded by increasing degrees. This could provide insight into how TLAP discharge scales with impacts to the recharge zone.

The second set of sensitivity analyses (**Figure 4-12)** involved changing flow from the final transport zones in the watershed to the recharge zone. This approach involved adjusting the fraction of outflow from the W1 and E1 zones that was directed to the Edwards Aquifer recharge zone versus the Trinity Aquifer units. In the Base Case model, an average fraction of 0.981 (98.1%) of flow was directed to the Trinity Aquifer, reflecting the outputs of the GSFLOW model. For the sensitivity analyses, flow directed to the recharge zone was increased to 0.25, 0.50, 0.75, and 0.981 for four tests. In this approach, the Trinity Aquifer flow system is assumed to be well-mixed, meaning all of the effluent is thoroughly distributed in the Trinity Aquifer flow. This results in progressively increased cumulative masses to the recharge zone, with uniform concentration due to the mass loading being dependent on the flow contribution to the Edwards Aquifer. **Table 4-2** summarizes the fractions used to partition the flow for the Base Case and the four tests.

Table 4-2 Fractions of flow from W1 and E1 to E1, recharge zone, and Trinity Aquifer.

	Fraction of flow from Source		Target
	W1	E1	
Base Case	0.015	---	E1
	0.001	0.022	recharge zone
	0.984	0.978	Trinity
Test 1	0.015	---	E1
	0.25	0.25	recharge zone
	0.735	0.75	Trinity
Test 2	0.015	---	E1
	0.5	0.5	recharge zone
	0.485	0.5	Trinity
Test 3	0.015	---	E1
	0.75	0.75	recharge zone
	0.235	0.25	Trinity
Test 4	0.015	---	E1
	0.984	0.978	recharge zone
	0.001	0.022	Trinity

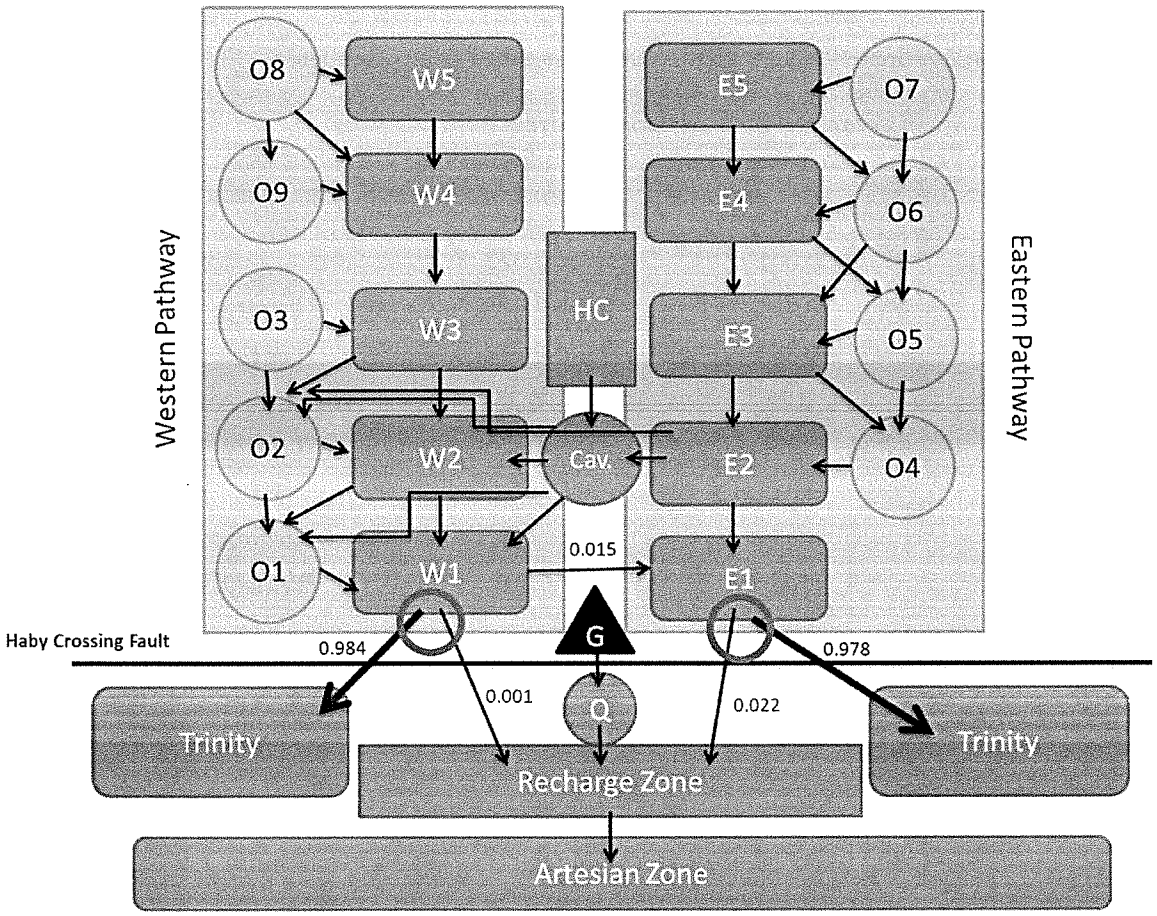

Figure 4-12 Infographic for sensitivity analyses changing the flow partitioned from W1 and E1 directly to the Edwards Aquifer recharge zone.

The red circles indicate location of modification; Flow is depicted within and from Western and Eastern pathways of the Helotes Creek watershed (noted by "W" and "E" elements) across Haby Crossing Fault (dark line) to the recharge zone; OSSF and TLAP reservoirs are noted by green circles, "HC" represents Helotes Creek, "Cav." represents the Cavernous stream valley, "G" represents the USGS gage, and "Q" represents the quarry; numbers on arrows from W1 and E1 indicate fractions of flow flowing to the different downstream reservoirs.

5 Results

5.1 MODPATH Particle Tracking Analysis

MODPATH particle tracking analysis was undertaken to determine the timing and extent of mass transport from different wastewater disposal facilities to the Edwards Aquifer based on the steady-state flow solution from the Helotes Creek watershed integrated hydrologic model. **Figure 5-1** shows the distribution of travel times for particles tracked forward from the water table beneath each of the twelve possible inflow polygons. As discussed elsewhere in this report, because travel times are contingent on the assumption that flow is through porous media, rather than a karstic carbonate aquifer with both conduit and diffuse flow, absolute travel times as uncertain, if not misleading. Relative differences in travel times among the Base Case and the eight scenarios, however, can be informative. **Figure 5-2** shows the results of reverse particle tracking for particles originating at the north face of the Edwards Receiving ZoneBudget Zone. It should be noted that travel-time results from particle tracking analyses are inversely proportional to the effective porosity values used for analysis. The effective porosity values used for this analysis were the same as the representative values used in the integrated hydrologic model, which is a further reason that travel-time results should not be interpreted as absolute values. Instead, travel-time values serve as a tool for comparison to determine the relative speed at which particles move through different flowpaths.

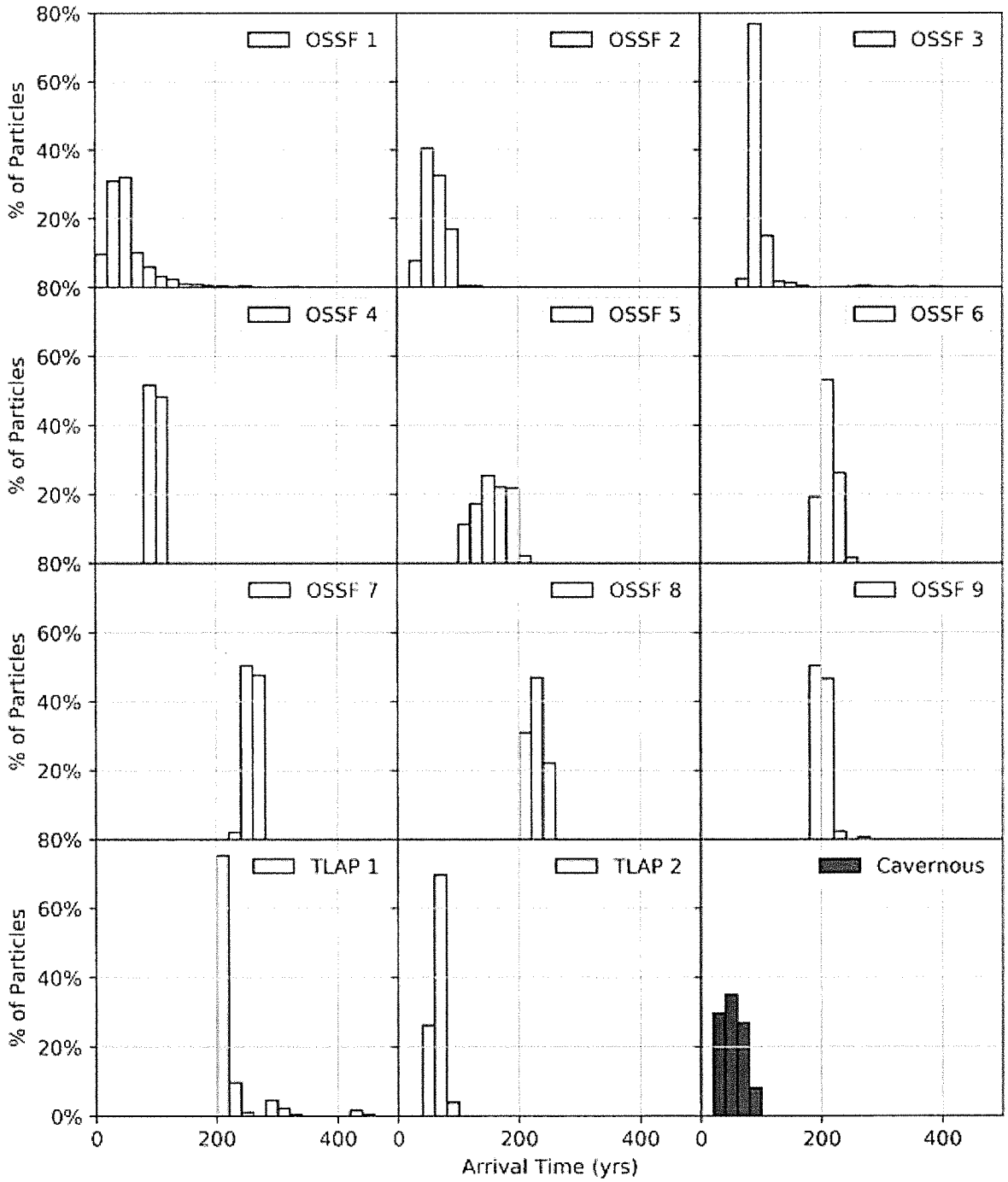

Figure 5-1 Histograms of particle arrival times (in years) at the Edwards Receiving ZoneBudget Zone for particles originating at the water table beneath each inflow polygon.

Particle travel times are based on forward particle tracking using MODPATH with flows from the steady-state solution for the Helotes Creek watershed integrated hydrologic model.

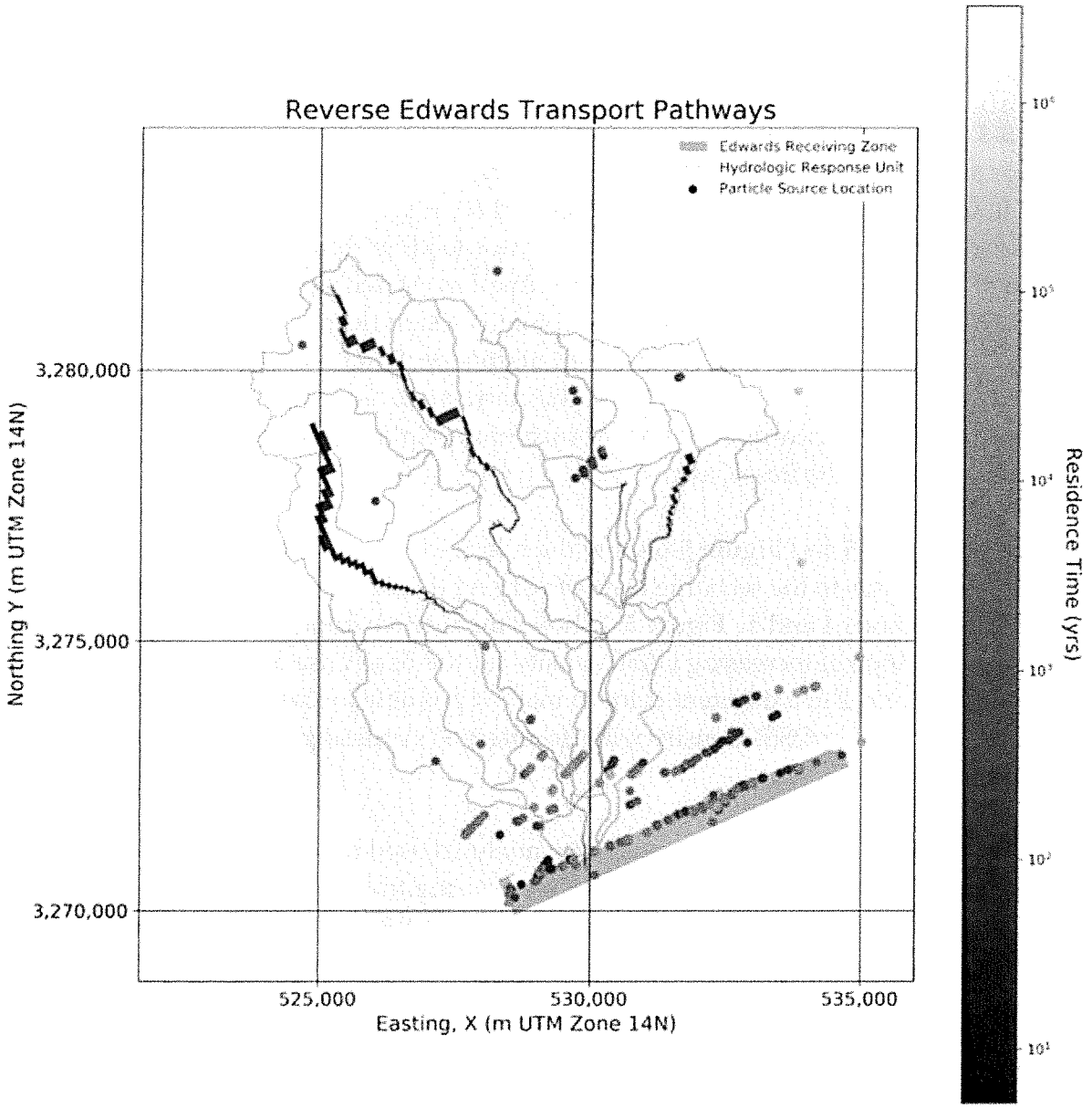

Figure 5-2 Endpoints from reverse particle tracking analysis.

Figure shows endpoints from the north face of the Edwards Receiving ZoneBudget Zone using MODPATH with flows from the steady state solution for the Helotes Creek watershed integrated hydrologic model. Each point represents the location where a particle terminated. Points are colored by residence time in the subsurface before reaching a termination point.

5.2 GoldSim Models

Solute-transport simulations carried out through GoldSim yield results regarding the quantity of mass transport in the watershed, as well as concentrations in conceptual reservoirs.Table 5-1 and **Table 5-2** showcase the total mass loading introduced as part

of each simulation and the summary of cumulative volumes and masses into the Edwards Aquifer recharge zone, respectively.

Figure 5-3 and **Figure 5-4** illustrate comparisons between different wastewater disposal scenarios and their impact on mass transport to the Edwards Aquifer. It's important to note that, under the construct of this analysis and the manner in which flow receptors are defined, only about 1.15% of the flow and mass loading from Helotes Creek watershed is discharged directly to what is defined as the recharge zone outside of the Helotes Creek watershed study area. Conceptually, a significant portion of flow and mass loading from Helotes Creek watershed discharges first to the Trinity Aquifer, then to the Edwards Aquifer. **Figure 5-4** shows the cumulative mass to the Trinity Aquifer (and ultimately, the Edwards Aquifer) for each of the eight scenarios relative to cumulative mass for the Base Case.

Table 5-3, Figure 5-5 and **Figure 5-6** show the relative impact on the cumulative volumes and masses to the recharge zone of varying the effluent discharge from TLAP facilities in Scenarios 4 and 5. **Figure 5-7** shows the relative impact on cumulative mass to the recharge zone of increasing OSSF density for the Base Case and Scenarios 1 and 3. It includes Scenario 2 in a different color to make it possible to simultaneously compare the effect of increasing OSSF density with the effect of increasing the average mass loading at each OSSF.

Table 5-4 details the results of the sensitivity analyses used to test assumptions made about interformational flow from Helotes Creek during the conceptualization and parameterization of the model. **Figure 5-8** shows the impact on cumulative mass to the recharge zone relative to the Base Case of increasing the amount of flow going from the transport pathways to the recharge zone to 25%, 50%, 75% and 90% of the total flow exiting the transport pathways.

Table 5-1 Total mass loading for the Base Case and the eight scenarios.

A discharge of 680 per day per household, mass load concentration of 40 mg/L for all OSSFs except for the malfunctioning OSSFs in Scenario 2a which has a mass load concentration of 80 mg/L, and a mass load of 20 mg/L for all facilities are assumed.

Scenario	OSSFs	Flow/d L/d	Load/d kg/d	Facility MGD	Load/d kg/d	TOTAL kg/d
Base Case	1412	960,160	38.4	0	0	38.4
1	1627	1,106,360	44.3	0	0	44.3
2a	184	125,120	10.0	0	0	-
2b	1228	835,040	33.4	0	0	43.4
3	1516	1,030,880	41.2	0	0	41.2

4	1255	853,400	34.1	0.14	10.6	44.7
5	1080	734,400	29.4	0.05	3.8	33.2
6	1255	853,400	34.1	0.86	65.1	99.2
7	1080	734,400	29.4	0.34	25.7	55.1
8	1080	734,400	29.4	0.80	60.6	89.9

Table 5-2 Summary of cumulative volumes and masses to Edwards Aquifer recharge zone and the Trinity for Base Case and eight scenarios.

Simulation	Cumulative volumes to recharge zone (m^3)	Cumulative masses to recharge zone (kg)
Base Case	502,600,000	1,294,000
1	502,600,000	1,513,000
2	503,400,000	1,462,000
3	502,600,000	1,447,000
4	502,600,000	1,357,000
5	502,600,000	1,272,000
6	502,600,000	1,587,000
7	502,600,000	1,378,000
8	467,600,000	1,527,000
	Cumulative volumes to Trinity (m^3)	**Cumulative masses to Trinity (kg)**
Base Case	5.68E+10	1.34E+08
1	5.68E+10	1.54E+08
2	5.68E+10	1.51E+08
3	5.68E+10	1.44E+08
4	5.68E+10	1.81E+08
5	5.68E+10	1.18E+08
6	5.68E+10	3.54E+08
7	5.68E+10	1.97E+08
8	2.25E+10	3.09E+08

Table 5-3 Cumulative volumes and masses to recharge zone from alternative TLAP SADDS scenarios.

TLAP Scenario	Cumulative volumes to recharge zone (m^3)	Cumulative masses to recharge zone (kg)
4 - 0.14 MGD	502,600,000	1,357,000
4 - 0.28 MGD	504,900,000	1,406,000
4 - 0.56 MGD	510,000,000	1,507,000
5 - 0.05 MGD	502,600,000	1,272,000
5 - 0.10 MGD	503,300,000	1,290,000
5 - 0.20 MGD	505,100,000	1,327,000

Table 5-4 Cumulative volumes and masses to recharge zone resulting from recharge zone sensitivity analyses 1 through 4.

Test	Cumulative volumes to recharge zone (m^3)	Cumulative masses to recharge zone (kg)
1	1.45E+10	3.41E+07
2	2.89E+10	6.82E+07
3	4.34E+10	1.02E+08
4	5.68E+10	1.34E+08

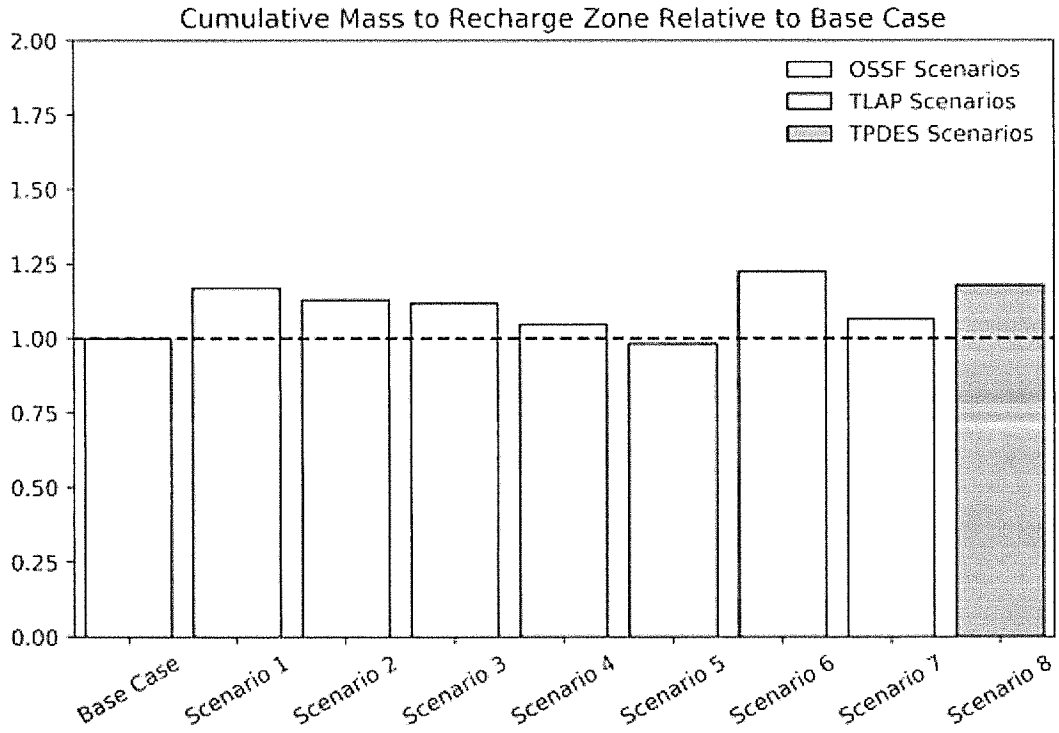

Figure 5-3. Comparisons between different wastewater disposal scenarios and their impact on mass transport to the Edwards Aquifer recharge zone

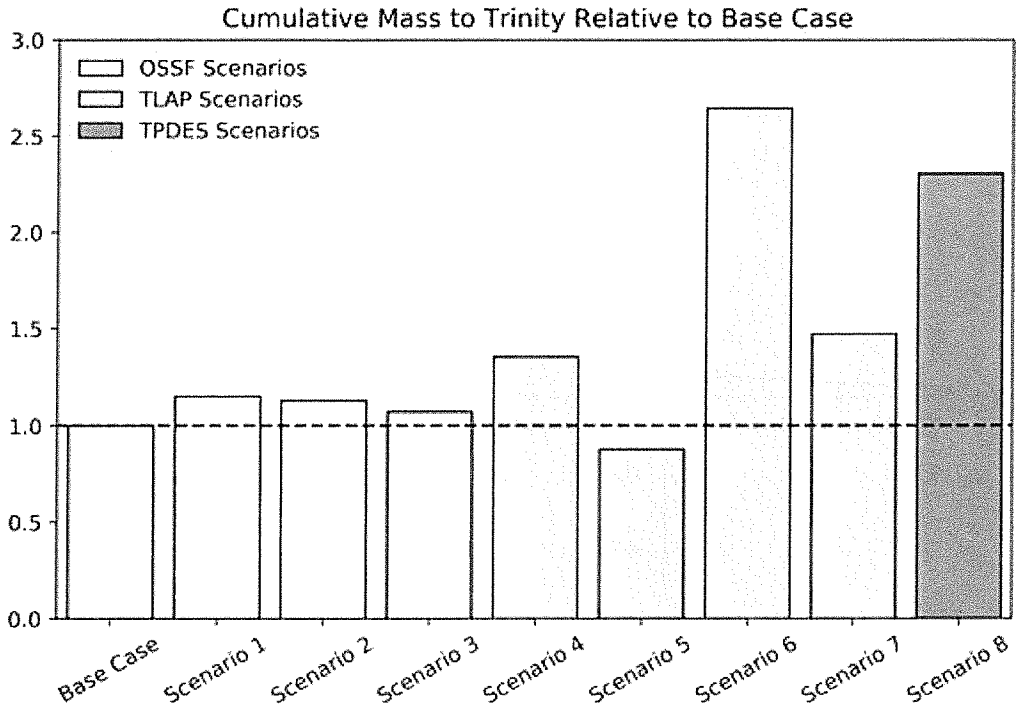

Figure 5-4. Comparisons between different wastewater disposal scenarios and their impact on mass transport to the Trinity Aquifer

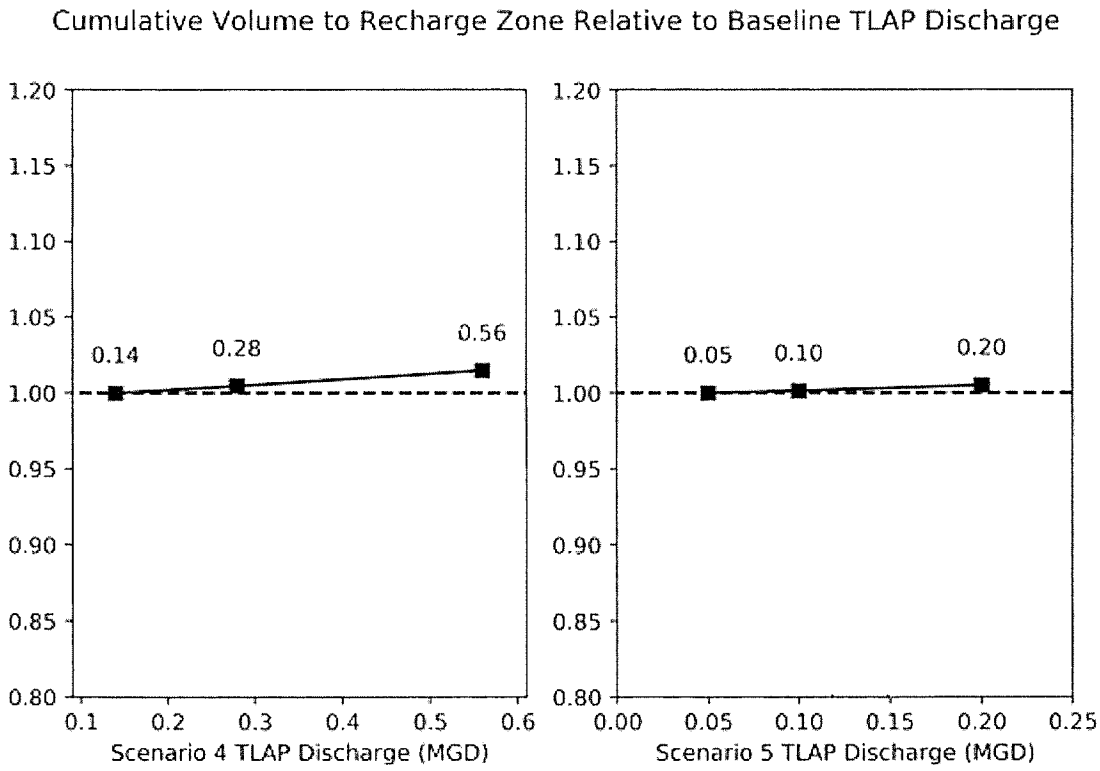

Figure 5-5. Relative impact on the cumulative volumes to the recharge zone of varying the effluent discharge from TLAP facilities in Scenarios 4 and 5

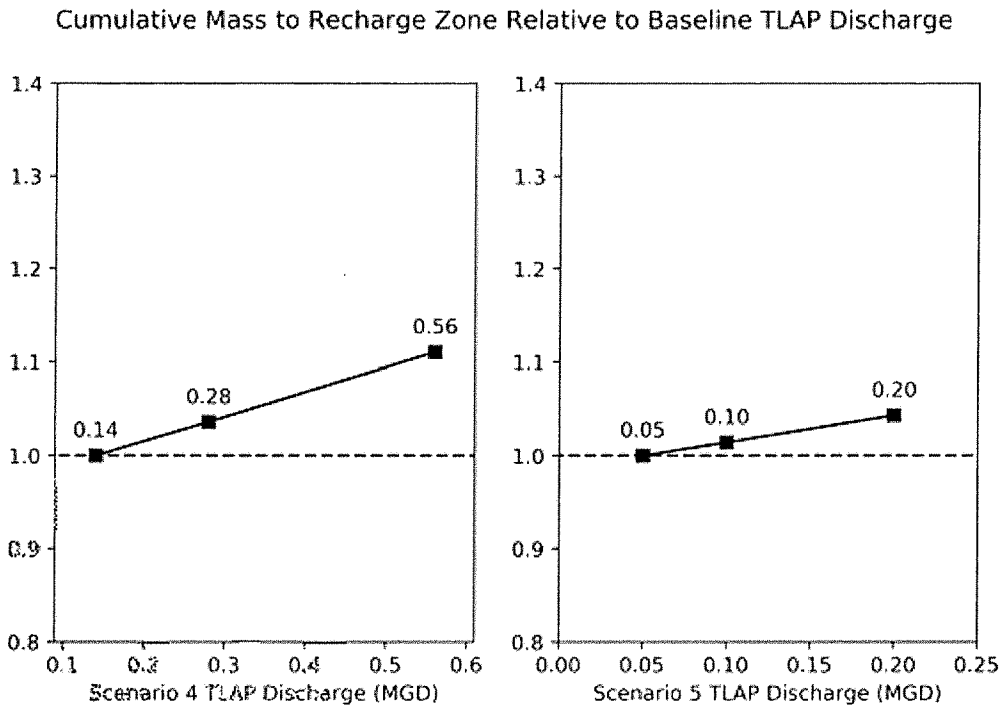

Figure 5-6. Relative impact on the cumulative masses to the recharge zone of varying the effluent discharge from TLAP facilities in Scenarios 4 and 5

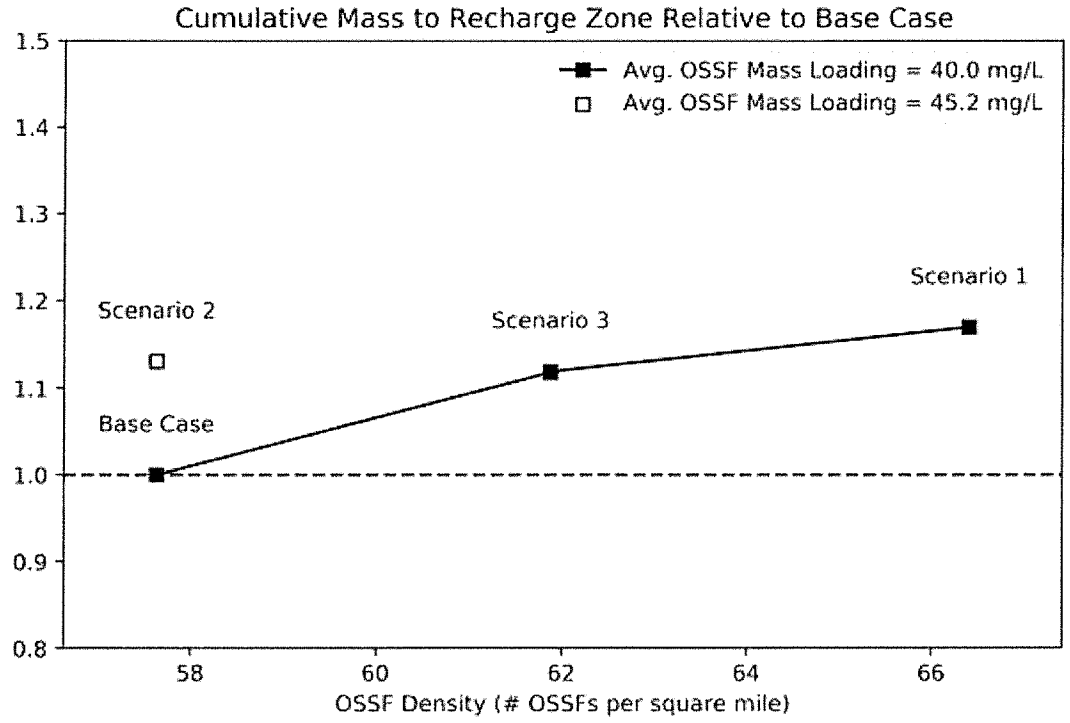

Figure 5-7. OSSF density among OSSF scenarios and comparative cumulative mass to recharge zone.

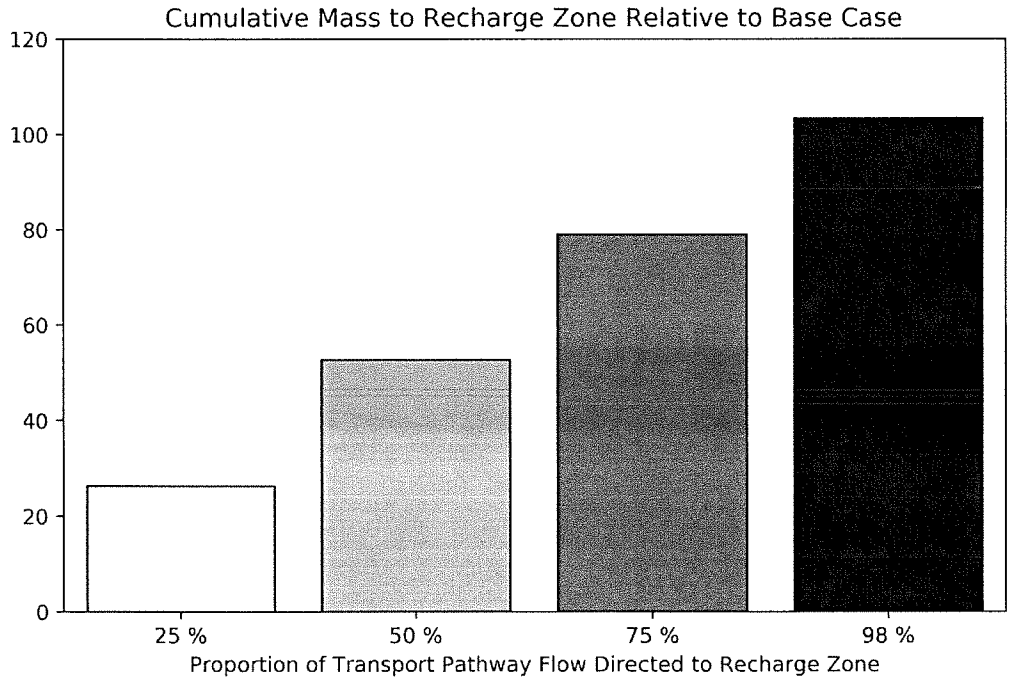

Figure 5-8. Depiction of recharge zone sensitivity analyses 1 through 4.

6 Discussion

The calibrated Helotes Creek watershed Integrated Hydrologic model yields reasonable estimates for regional groundwater-flow directions and rates. The model is a useful tool because it combines meteorological and terrain characteristics of the watershed, the geologic framework of the region, our conceptual hydrologic model – including general hydrostratigraphic characteristics of each geologic material, qualitative knowledge of gaining and losing reaches in Helotes Creek, and spatial knowledge of where interformational flow and direct recharge to the Edwards Aquifer recharge zone occur, –and a limited amount of calibration data. Model results indicate that it effectively simulates surface-water and groundwater flow in the Helotes Creek watershed. In this way, it effectively synthesizes all available information and is able to simulate the most essential hydrologic characteristics of the watershed as best we understand them.

The Helotes Creek watershed study area relies solely on OSSF-type wastewater disposal facilities. Neither TLAP- nor TPDES-type wastewater disposal facilities are present in the watershed. For this reason, eight hypothetical scenarios were identified to explore and evaluate the relative impact that different wastewater disposal facility type and the location of each facility within the Helotes Creek watershed would have on recharge to the Edwards Aquifer. A transport model that relied on flow fields generated by the integrated hydrologic model was used to simulate each the Base Case and the eight scenarios that represent the three wastewater disposal facility types under a variety of conditions. Given the absence of either a TLAP or TPDES in the Helotes Creek watershed, in particular, and the paucity of relevant data on discharge input and impacts, in general, data drawn from other geographic locations within the Texas Hill Country were used to develop the eight scenarios.

Results of the Base Case and eight scenario analyses (**Table 5-2**) indicate all scenarios, with the exception of Scenario 5 (TLAP SADDS in the southern portion of the watershed) would generate greater mass loadings discharged to the Edwards Aquifer relative to the status quo represented by the Base Case (**Figure 5-3** and **Figure 5-4**). There are marginal increases to the mass loading to the Edwards Aquifer for the three OSSF-based scenarios (i.e., Scenario 1 – accounting for non-permitted OSSFs; Scenario 2 – accounting for malfunctioning OSSFs; Scenario 3 – additional OSSFs associated with future residential construction in the northern portion of the watershed) as would be expected. Increases for these scenarios were no greater than about 15.3% relative to the Base Case.

As shown in **Figure 5-4**, higher OSSF density in the Helotes Creek watershed resulted in higher cumulative masses to the recharge zone. However, cases of lower density but higher effluent concentrations could result in higher cumulative mass to the recharge zone than cases of higher density but lower effluent concentrations, as highlighted by Scenario 3. Scenario 3, in which there is an increase in OSSFs in the northern OSSF groups, demonstrated the lowest cumulative mass to the recharge zone among the hypothetical OSSF scenarios. This indicates that, with respect to OSSFs, a greater distance from the recharge zone could result in lower impacts to the waters that recharge the Edwards Aquifer.

Scenarios 4 through 8 were conceived to assess the impact of non-OSSF wastewater disposal facilities on the Edwards Aquifer. The size of the TLAP and TPDES facilities were predicated on available land in Helotes Creek watershed, 32 acres at the location in the northern portion of the watershed, and 13 acres in the southern, more developed, portion of the watershed. Available land was the factor used to determine the capacity of the TLAP facilities.

The results from both the northern TLAP SADDS and TLAP SS scenarios resulted in higher cumulative mass to the recharge zone than their southern counterparts. This is likely due to the larger application area and increased commensurate effluent disposal of the northern TLAP scenarios. The application rate for a TLAP SS facility is 0.1 gal/ft^2/day, which comports with the maximum allowable application permitted in this region of Texas. The application rate for a TLAP SADDS facility is 0.060 gal/ft^2/day, which is within the range of application rates of similar facilities in other areas of the Texas Hill Country. Hence total discharge at the northern location was greater than the discharge rate at the southern location due to reduced acreage at the southern location.

Scenario 5, in which a TLAP SADDS facility in the southern portion of Helotes Creek watershed replaced the OSSFs that formed OSSF group 2 in the Base Case, had the lowest mass loading to the Edwards Aquifer that was equivalent to about 88% of the mass loading of the Base Case (**Figure 5-3** and **Figure 5-4**). The decrease in mass loading is attributed to the fact that removal of group 2 OSSFs has a greater impact than the inclusion of a TLAP SADDS facility in the southern portion of the watershed.

The four remaining scenarios exhibited sizable increases to mass loading discharged to the Edwards Aquifer. Installation of the two types of TLAP facilities (i.e., Scenario 4 – SADDS in the north and Scenario 7 – SS in the south) released approximately 1.35 and 1.47 times more mass loading to the Edwards Aquifer relative to the Base Case, respectively.

The sole scenario of a TPDES facility (Scenario 8) discharged approximately 2.3 times as much mass loading to the Edwards Aquifer relative to the Base Case. The TPDES was located in the southern portion since it is likely that a centralized wastewater facility would be located downgradient from residences that discharge wastewater to the facility.

Scenario 6, in which a TLAP SS facility is located in the northern portion of Helotes Creek watershed and replaces the OSSFs that formed part of OSSF groups 8 and 9 in the Base Case, had the highest mass loading to the Edwards Aquifer (**Figure 5-3** and **Figure 5-4**). Scenario 6 released approximately 2.63 times as much mass loading to the Edwards Aquifer relative to the Base Case.

Model simulation results indicate that the extent of impact from TLAP and TPDES facilities depends on location and method. For both TLAP SS and TLAP SADDS facilities, being located in the northern portion of the Helotes Creek watershed resulted in significantly greater mass loading to the Edwards Aquifer when compared with locations in the south. This result is likely a result of the higher level of mass loading at the northern location compared with the southern location due to larger available land for wastewater application (i.e., 32 acres at the northern location versus 13 acres at the southern location).

MODPATH particle tracking analysis was used to determine flowpaths for particles based on the steady-state solution for groundwater flow in the region. Forward particle tracking from locations at the water table directly below real and hypothetical wastewater disposal facilities, detailed in **Figure 4-3**, **Figure 4-4**, and **Figure 4-5**, indicates that solute transport occurs in the direction of the Edwards Aquifer recharge zone from all facilities. As shown in **Figure 5-1**, particles originating closer to the Edwards Aquifer recharge zone, i.e. in the southern portion of the watershed near the outlet, have shorter travel times than those in the upland, northern portions of the watershed. The existence of hypothesized pathways directly to the recharge zone for surface water in Helotes Creek via the quarry implies that near-stream locations in the contributing zone are more vulnerable to degradation for wastewater disposal methods where some portion of the mass loading runs off to streams, specifically TLAP aerial dispersal methods. Additionally, the relatively short travel time for particles that infiltrate into the Cavernous Glen Rose from Helotes Creek compared to particles that load to the water table elsewhere provide additional support for the fact that near-stream locations are vulnerable to degradation when some portion of the mass loading from a facility can enter the stream. Ultimately, flow from Helotes Creek watershed is to the Edwards Aquifer, whether as surface flow to the recharge zone in the quarry or as

groundwater either directly from the Edwards Aquifer or via the Trinity Aquifer (**Figure 6-1**).

The number of households served by these facilities is calculated using the estimate that 680 L of wastewater is generated per day per household (**Table 3-2**). Acreage required for this number of households can be calculated by estimating how many homes per acre are built in the hypothetical development(s). **Table 6-1** assumes 3.5 households per acre although some developments have as many as six homes per acre. If more households are built per acre, total acreage for the development(s) would be less. Given that Helotes Creek watershed covers 15,560 acres with large undeveloped tracts, opportunities exist for construction of developments requiring 80 to 1,368 acreages.

Table 6-1 Wastewater rate disposed, equivalent homes, and required acres for scenarios 4 -7.

Equivalent home calculation is predicated on the assumption that each household generates 680 L effluent per day.

Scenario	L/d	Equivalent homes	Required acres
4	529,957.6	779	223
5	189,270.6	278	80
6	3,255,454.1	4,787	1,368
7	1,287,040.0	1,893	541
8	3,028,329.4	4,453	1,272

The trophic state of Helotes Creek is slightly mesotrophic or oligotrophic based on sampling of sestonic chlorophyll (Section 2.5.7). Benthic chlorophyll sampling indicates that the Helotes Creek watershed might be classified as oligotrophic or slightly mesotrophic. Replacement of OSSFs in the southern portion of the watershed with a TLAP SADDS with limited disposal capacity (i.e., 0.05 MGD) would not likely impact the trophic state of the watershed (Scenario 5). Installation of larger systems, such as the TLAP in Scenarios 4, 6, and 7 or the TPDES in Scenario 8, however, would add sufficient mass loading (i.e., nutrients) to the system to potentially alter the trophic state to be mesotrophic or eutrophic (Mabe, 2007; Herrington, 2010).

Sensitivity Analyses

The sensitivity analyses involving increased effluent discharge from TLAP SADDS facilities predictably demonstrated increased cumulative volumes and masses to the Edwards Aquifer recharge zone (**Table 5-3, Figure 5-5, and Figure 5-6**). The four tests in which both the volume and mass flows issuing from W1 and E1 were increasingly directed to the Edwards Aquifer recharge zone predictably demonstrated an increase in cumulative volumes and masses to the recharge zone (**Table 5-4** and **Figure 5-5**).

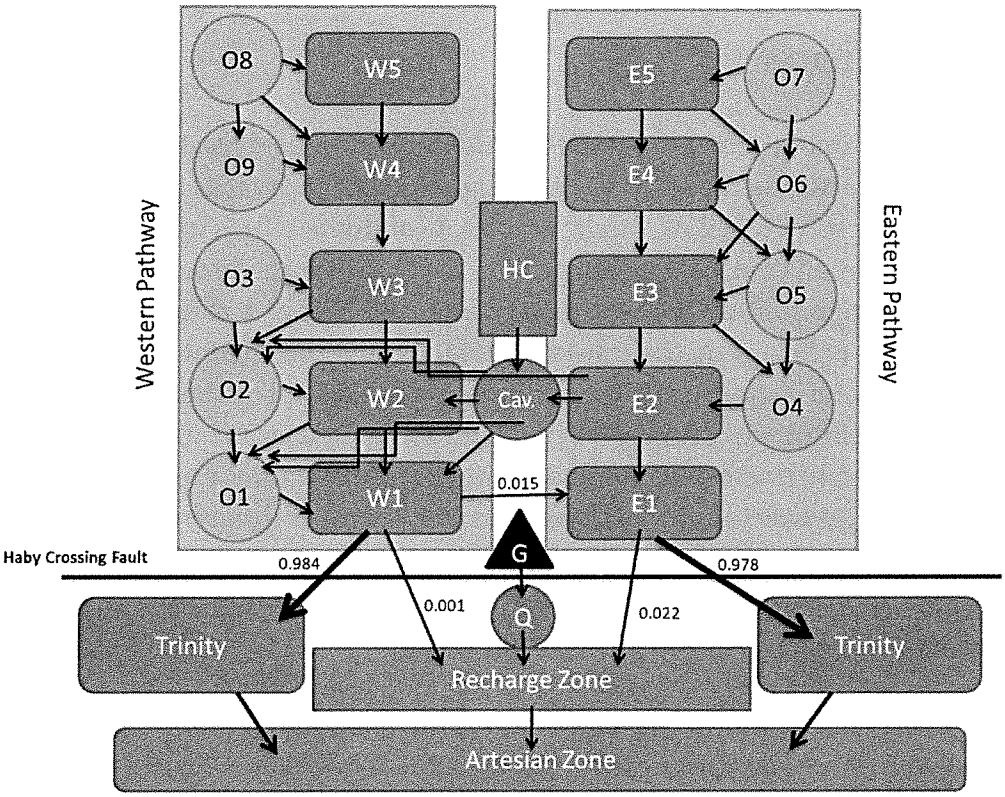

Figure 6-1. Infographic depicting the flow from the Helotes Creek watershed exiting via the Edwards Aquifer recharge zone and Trinity units to the Edwards Aquifer artesian zone

Figure depicts flow within and from Western and Eastern pathways of the Helotes Creek watershed (noted by "W" and "E" elements) across Haby Crossing Fault (dark line) to the recharge zone; OSSF and TLAP reservoirs are noted by green circles, "HC" represents Helotes Creek, "Cav." represents the Cavernous stream valley, "G" represents the USGS gage, and "Q" represents the quarry; numbers on arrows from W1 and E1 indicate fractions of flow flowing to the different downstream reservoirs.

7 Limitations

Groundwater flow in both the integrated hydrologic model and the transport model is characterized as porous media flow, even though both the Edwards and Trinity aquifers are clearly recognized as karstic carbonate aquifers which exhibit both conduit and media flow (Green et al., 2014; Sharp et al., 2019). Although groundwater flow patterns could change slightly if characterized and modeled as a conduit/diffuse flow system rather than a porous media flow system, the most prominent difference between the two flow characterizations is flow and transport velocity. For this reason, flow and transport velocity simulations are not recognized as realistic or meaningful. This limitation is not overly onerous when evaluating the simulation outputs because the objective of the study was to compare flow and transport for different wastewater disposal facilities in which all scenarios are predicated on identical flow mechanisms. Hence, relative differences in flow and transport attributes among the scenarios are the key output, not absolute flow and transport velocities.

The lack of water-level data for most formations included in the model, quantitative constraints on surface-water/groundwater interactions in Helotes Creek, and quantitative constraints on interformational flow at Haby Crossing Fault limit the extent to which the model can be calibrated to represent real-world flows. The transport model estimated transport rates and mass for different reservoirs predicated on flows simulated with the integrated hydrologic model. Results from the transport model are sufficiently accurate to compare the relative mass loadings generated by different wastewater disposal facilities, but are not sufficiently constrained to ascertain actual flow paths and rates.

One unanswered question is whether wastewater disposal facilities that load mass to the stream rather than to the water table have a relatively larger impact. Simulated impacts on cumulative mass for the hypothetical TLAP SS and TPDES facilities in Scenarios 6-8 (**Figure 5-3** and **Figure 5-4**) provide insight. The two simulated largest mass loadings are the northern TLAP SS (Scenario 6) and the TPDES located in the south (Scenario 8). Differentiating differences between their relative impacts exceeds the resolution of the simulations. Additional combined field and possibly laboratory studies are needed to provide the bases to resolve this question. In particular, the ability of soils present in Helotes Creek watershed to impede infiltration of the solute to the water table or to affect overland flow would benefit the determination of this question. In addition, the model assembled for flow and transport analysis in this study lacks

sufficient resolution to discern the second-order differences in transport in the two scenarios. Regardless, the model assembly was effective in demonstrating the relative greater mass loading experienced in the northern TLAP SS and the TPDES located in the southern portion of Helotes Creek watershed.

8 Conclusion

An integrated hydrologic model of Helotes Creek watershed was developed to generate surface-water/groundwater regimes of the study area. A transport model calculated transport rates and mass inflows for different reservoirs predicated on flows simulated with the integrated hydrologic model. The integrated hydrologic model developed for Helotes Creek watershed incorporated all available information and data for the study site. Nonetheless, during development of the model, it became apparent that this information and data were insufficient to develop a robust comprehensive model of the study domain. Although this shortcoming limits the model when attempting to make detailed, high-resolution predictions of flow and transport in the Helotes Creek watershed, the model is shown to be useful and defensible when making comparative assessments in which the foundational conceptualizations are the same for the cases being compared.

A Base Case model was constructed to replicate, to the degree possible, mass loading from OSSFs currently present in Helotes Creek watershed. Mass loading for the Base Case was calculated using the transport model predicated on flows generated using the integrated hydrologic model. Mass loadings from eight alternative scenarios generated by different wastewater disposal facilities were calculated using the same modeling assembly. Mass loadings calculated for the eight scenarios were compared with the Base Case to provide insight on the relative impact that different wastewater disposal facilities would have on the quality of water recharged to the Edwards Aquifer.

The scenarios were developed to evaluate the anticipated impact on recharge to the Edwards Aquifer from a variety of OSSF scenarios and from hypothetical TLAP and TPDES wastewater facilities in Helotes Creek watershed. For TLAP and TPDES scenarios, OSSFs in the model were removed from the area proximal to the hypothetical wastewater disposal facility to remove duplication of wastewater disposal.

Two locations in the watershed were considered for TLAP facilities, one in the less developed upgradient northern portion of the watershed and one in the more developed southern portion. Mass loading from each system was predicated on the size of the land available at each site, 32 acres at the northern location and 13 acres at the southern location. Only one TPDES scenario was considered. It was located at the same site as the southern TLAP scenarios.

Volumetric wastewater volumes varied from 0.05 to 0.86 million gallons per day (MGD) in the various scenarios. Similarly, nitrogen loadings varied from 33.2 to 99.2 kg/d. Mass loading disposal at the northern location was greater than loading at the southern location, hence mass loading to recharge of the Edwards Aquifer was greater for scenarios that represented facilities at the northern location. The size and capacity of the hypothesized wastewater facilities were reasonable and consistent with possible residential development in the study area. Capacity of the facilities was sufficient for upwards of 4,800 homes covering almost 1,800 acres. Residential developments of this size are conceivable within the 15,640 acres of the Helotes Creek watershed.

Modeling of the Base Case and eight scenarios demonstrates that the relative impacts of OSSFs, TLAP SADDS, TLAP SS, and TPDES practices vary depending on disposal type, mass loading, and location of the facilities. The simulation analyses illustrated that all scenarios resulted in higher cumulative mass to the recharge zone relative to the Base Case with the exception of the modest-sized TLAP SADDS, indicating that in cases of increased development or failure of OSSF systems, increased impacts to the quality of recharge to the Edwards Aquifer are to be expected. The scenarios with greatest impact on cumulative mass to the recharge zone were the large, northern TLAP SS scenario and the TPDES scenario. Differences in facility type may impact the delivery and whether any mass is diverted *en route* from the point of disposal to entry into the Edwards Aquifer, however, the bottom line is that greater discharge to the environment will result in greater mass loading to recharge of the Edwards Aquifer.

Water chemistry analyses of nutrients were inconclusive with respect to characterizing the Helotes Creek watershed's trophic state. However, periphyton and sestonic sampling and analysis indicate that the current trophic state of the Helotes Creek watershed is oligotrophic and possibly slightly mesotrophic which suggests that the stream and stream system have been marginally impacted by wastewater discharges, although more comprehensive sampling would be required to refine this characterization. Currently, OSSFs are the only type of wastewater disposal facility used in the Helotes Creek watershed. Transport simulations support the argument that if either a TLAP or TPDES facility were to be installed in Helotes Creek watershed and that the cumulative amount of wastewater disposed was substantially increased, the trophic state of Helotes Creek would be further degraded and likely classified as fully eutrophic.

9 Recommendations

As described herein, an integrated hydrologic model of Helotes Creek watershed was developed to generate surface-water/groundwater regimes of the study area. A transport model estimated mass flows for different reservoirs predicated on flows simulated with the integrated hydrologic model. A Base Case model was constructed to replicate, to the degree possible, mass loading from OSSFs currently present in Helotes Creek watershed. Mass loading for the Base Case was calculated using the transport model predicated on flows generated using the integrated hydrologic model. Mass loadings from eight alternative scenarios generated by different wastewater disposal facilities were calculated using the same modeling assembly. Mass loadings calculated for the eight scenarios were compared with the Base Case to provide insight on the relative impact that different wastewater disposal facilities would have on the quality of water recharged to the Edwards Aquifer.

Although eight scenarios were considered in the current project, evaluation of additional scenarios could provide further insight into the impact of other possible wastewater disposal facility types, locations, or number of units. Calculation of mass loadings for additional scenarios would not be a large effort if flow conditions remain the same as was assumed for the eight scenarios already considered. Additional scenarios could address the following hypothetical cases:

- Replacing all existing OSSFs with a centralized wastewater disposal facility.
- Higher density residential construction that would warrant additional or larger wastewater disposal facilities.
- Placement of wastewater facilities at alternative locations within Helotes Creek watershed.
- Revise loadings for the TLAP facilities by increasing or decreasing the size of land used for land application.
- Explore the impact of OSSF density and location by altering actual OSSF locations with hypothetical OSSF locations.
- Modify the distance of TLAP and TPDES facilities from creek channels, in both the northern and southern portions of the Helotes Creek watershed.
- Compare TLAP and TPDES facilities with similar capacity placed at different locations within the watershed.

These recommendations fall within the constraint of the current EAPP project, namely that the project be fully contained within the boundaries of Bexar County. Now that a transport/flow model structure is developed and available, it would be informative to apply the model to critical areas in the Edwards Aquifer contributing and recharge zones located outside of Bexar County. The Concan recreational area in northern Uvalde County is an example of a rural area whose natural resources are under significant pressure due to expanded recreational and residential development. The debate regarding this development includes the critical question regarding which types of wastewater disposal facilities would have greater (or lesser) impact on the quality of the river and associated river systems.

There are clearly other areas in the Edwards Aquifer contributing and recharge zones experiencing similar development pressures. Having the ability to quantitatively calculate the impact in terms of mass loading on rivers and streams would greatly enhance the ability of the: 1) City of San Antonio to measure the impact from protecting lands as part of the EAPP; and 2) Texas Commission on Environmental Quality to evaluate the impact of the installation of wastewater disposal into rivers and streams in the Edwards Aquifer contributing and recharge zones as part of its permitting processes.

Extension of the modeling technology developed by this project to other applications would be more extensive than simply using the Helotes Creek watershed model to evaluate additional scenarios. Namely, an integrated hydrologic model would need to be developed for each watershed targeted for evaluation. The workflow to develop the integrated hydrologic model has been developed as part of this project and is now available, however, data for each location would need to be compiled, a hydrostratigraphic model would need to be constructed, and model synthesis and calibration would be necessary to generate the flow regimes appropriate for each watershed. Only then would solute-transport scenario testing be available to compare different wastewater disposal facility strategies for these additional watersheds.

Flow and transport were modeled based on the assumption that the Edwards and Trinity aquifers can be represented as porous media. Both aquifers, however, are karstic carbonate systems in which flow is appropriately defined as a conduit/diffuse flow system (Sharp et al., 2019). More representative flow and transport simulations would be generated if the models were converted to a conduit/diffuse flow system rather than porous media. This is not a trivial exercise and considerably more characterization data, including tracer testing, would be required before such a conversion could be undertaken (Scanlon et al., 2003; Green et al.,2006; Green et al., 2019a, 2019b).

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Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:47 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001
Attachments: 20230225-harrison-tpdes-public-comment-david-drewa.pdf

PM

From: david@drewadesigns.com <david@drewadesigns.com>
Sent: Saturday, February 25, 2023 10:11 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: David Drewa

EMAIL: david@drewadesigns.com

COMPANY:

ADDRESS: 21406 ENCINO LOOKOUT
SAN ANTONIO TX 78259-2656

PHONE: 2104815335

FAX:

COMMENTS: Please reference the attached PDF.

21406 Encino Lookout
San Antonio, TX 78259

Ms. Laurie Gharis, Chief Clerk
Office of the Chief Clerk, MC 105
Texas Commission on Environmental Quality
PO Box 13087
Austin, TX 78711-3087

February 25, 2023

RE: Wastewater Discharge Permit No. WQ0016211001

Ms. Gharis:

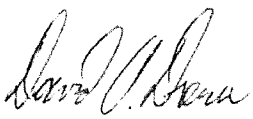
I am hereby requesting a public meeting on permit application WQ0016211001.

Some of the unanswered questions area residents have about this wastewater discharge permit application include:

- Since the effluent will be flowing into and over the Edwards Aquifer Recharge Zone (primary source of drinking water for over two million people), what additional protections will be implemented beyond what is normally required for wastewater discharge permits?
- What protections will be implemented for area wells drawing from the Trinity Aquifer?
- Relative to other discharge permits in the Hill Country, 600,000 gallons per day represents a very high volume of effluent. Why such a high volume on this permit application? What development is this plant intended to support?
- Considering the proximity to EARZ and ultimate flow into the Comal River, what alternatives (such as land use application, beneficial reuse, or enhanced treatment/reduced volume) have been considered?
- A thorough environmental impact assessment should be performed to assess the possible negative impact on the many area caves and caverns.

Without further information and impact surveys, this permit application should be denied. At a very minimum, a public meeting should be held to give the developer and TCEQ an opportunity to present useful information to the public about their proposed plans.

Sincerely,



David A. Drewa

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, March 2, 2023 1:49 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: LDominickPM@gmail.com <LDominickPM@gmail.com>
Sent: Wednesday, March 1, 2023 7:34 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Leon Dominick

EMAIL: LDominickPM@gmail.com

COMPANY:

ADDRESS: 311 CLEAR LAKE DR
NEW BRAUNFELS TX 78132-1847

PHONE: 2817847885

FAX:

COMMENTS: I live in the area of the permit request and have a water well that my affect my water if approve. I request a a public meeting on this wastewater Discharge as well as a contested case review. Thank you. Leon Dominick.

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Don Everingham

Mailing Address: 601 Pfeiffer Rd

Physical Address (if different): —

City/State: Buchverue, TX. **Zip:** 78163

This information is subject to public disclosure under the Texas Public Information Act

Email: dlltexas@gvtc.com

Phone Number: (830) 438-3371

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

written Concerning Harrison Plant WWTP PERMIT # WQ0016711001.
By Don Ensingham Comal County Texas.

At this point in time Nothing pertaining to the permit is approved and most likely should remain that way. Given that accumulative impact of Contamination and multiple facilities Could be present. Karst are stated to have been Considered, but most likely ignored. Who the operator is or will be is not determined and needs to be resolved if this permit is to move forward. wells are Currently impacted by Karst Contamination with some known Contamination in the area. No plume apparently have been Considered for failure or for extreme flooding which are both real possibilities. The Quarry is an added problem that opens the possibility to major Contamination problems for the Edwards Aquafer The TCEQ has failed several times in Central Comal to properly evaluate the Karst formations and the resulting problems for the Aquafer and recharge land. Personal property Conservation and way of life is a major Concern for all in the area of this proposed permit. TCEQ needs to protect the land owners, and way of life in the Hill Country. The agency has on many occasions failed to do the job they should do. Hopefully the will of the people will be heard and this development and permit will end tonight.

No one has looked at the whole picture of the Hill Country and what it means to the citizens of Comal County.

Thank you for the opportunity to comment.

Don Ensingham

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, March 1, 2023 2:12 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: nhfitzpatrick@gvtc.com <nhfitzpatrick@gvtc.com>
Sent: Wednesday, March 1, 2023 6:54 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Nancy Fitzpatrick

EMAIL: nhfitzpatrick@gvtc.com

COMPANY:

ADDRESS: 648 RIVER CHASE WAY
NEW BRAUNFELS TX 78132-6300

PHONE: 8302267218

FAX:

COMMENTS: REQUEST A PUBLIC MEETING

Kimberly Muth

From: PUBCOMMENT-OCC
Sent: Wednesday, June 14, 2023 9:05 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001
Attachments: TCEQ Harrison WWTP application 0613231.pdf

From: jdflood@tutanota.com <jdflood@tutanota.com>
Sent: Tuesday, June 13, 2023 5:33 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: JOHN D FLOOD

EMAIL: jdflood@tutanota.com

COMPANY:

ADDRESS: 338 VUELO ST
NEW BRAUNFELS TX 78132-0162

PHONE: 3256654399

FAX:

COMMENTS: Please see comments in attached file.

June 13, 2023

Office of the Chief Clerk, MC 105

TCEQ

PO Box 13087

Austin, Texas 78711-3087

RE: Proposed Wastewater Treatment System Permit WQ0016211001

Chief Clerk,

I have reviewed the referenced permit application and have the following questions and comments.

1. J.A Wastewater LLC shows a business address of 5765 Fig Way, Arvada, Colorado 80002. A Google map review shows this to be a residence. J.A Wastewater is owned by Jamie Miller and appears to have one employee, Michael McMinimee. As a small, out-of-state business, I would like to know more about JA's experience designing, building and permitting wastewater treatment facilities in Texas. Please provide a list of operating projects that JAW has overseen and a summary of their operational history.
2. What is the backup power supply source for the plant?
3. In the event of a main power outage, will the backup power supply be able to support all plant electrical demand to assure compliant operation of the facility?
4. How will UV disinfection occur during an electrical power outage?
5. What is the potable water source for the facility?
6. How will potable water be supplied to the facility during an electrical power outage?
7. Does water in the Dry Comal Creek percolate into the aquifer?
8. Where does the Meyer Ranch WWTP effluent discharge?
9. Has the Meyer Ranch WWTP maintained operation compliance since it began operation?
10. The answer to question 6 on page 18 is incomplete. Please describe the depth of excavation and sealing cave or other karst features that may be encountered during construction.
11. Pg 6 of 80, question 3, Grit Disposal, is not answered.
12. Pg 7 of 80, question 1 from page 6 of 80, "Does the facility have an approved pretreatment program under 40 CFR Part 403", is not answered.
13. What chemicals and quantities will be used at the facility?
14. Will the chemicals be reported on a Tier II report?

15. What solid and hazardous wastes will be generated and in what estimated quantities?
16. Who will apply for the Notice of Registration for the facility?
17. Where will WWTP sludge be stored prior to disposal?
18. What contingency will be in place in the event of a sludge basin breach?
19. Will the facility need a SPCC plan?
20. Were individual septic wastewater treatment systems considered as an option for the subdivision homes?
21. What is Ronnie Rodriguez background?
22. Des Mr. Rodriguez have sufficient training to manage onsite chemical storage and usage, and emergency response training in the event of a chemical, raw sewage or sludge release?
23. How many additional employees will be hired for day-to-day operations?
24. It is stated that, "It is the intent of the facility to provide capacity for future regional development other than the Harrison Tract subdivision." Please describe the future development plan.
25. During the June 8, 2023 public meeting, it was stated, "When we submitted the application to the TCEQ, we also submitted a 210 Reuse Permit," said Helen Gilbert, an attorney for law firm Barton Benson Jones. "A reuse authorization application, the intent is to reuse 100% of the water on the site and not discharge anything." Has the Reuse permit application been reviewed and approved by TCEQ?

Thank you for the opportunity to comment on this proposed permit. I look forward to your responses and can be reached at jdflood@tutanota.com if you have any questions.

Sincerely,

John Flood

John Flood

(8)

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Jerry & Nancy Ford (8)

Mailing Address: 58 Guada Coma

Physical Address (if different): _____

City/State: New Braunfels Tx **Zip:** 78130

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: nford10@satx.rr.com

Phone Number: (830) 708-4968

- Are you here today representing a municipality, legislator, agency, or group? ☒ Yes ☐ No

  If yes, which one? City of New Braunfels Resident

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

☑ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

I am opposed to any discharge of any kind into the aquifer and/or Dry Comal that will end up in the Comal River. This is very bad!

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, March 1, 2023 2:11 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: HoneyBeeBisou@gmail.com <HoneyBeeBisou@gmail.com>
Sent: Tuesday, February 28, 2023 10:41 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Christine Garcia

EMAIL: HoneyBeeBisou@gmail.com

COMPANY:

ADDRESS: 363 SUGARCANE
NEW BRAUNFELS TX 78132-0151

PHONE: 6199719898

FAX:

COMMENTS: I strongly oppose this permit. The dumping of this treated waste water can place off balance into the dry Comal creek and endanger the home of seven endangered species unique biota, thousands of natural springs, and the creeks and rivers they feed. Even if the water is cleaned, it is cleaned and sanitized with an abundance of chemicals, which are supposed to kill of bacteria, fungus and organic compounds. The wildlife and fish feed off these compounds which will ultimately push out wildlife and ruin city / county parks which so much of the population picked New

Braunfels as their home. This is not good for Comal County, New Braunfels or for Texas. Texas hill country was the reason I moved to New Braunfels. Texas hill country is known for its wildlife. Driving away the wildlife will not only be detrimental to the ecosystem, but also detrimental for the people. Hunting, fishing and wildlife watching will slowly decline with the approval of this permit. This is the reason why so many coastal cities around the country have ceased to continue the practice of dumping treated waste water into the ocean. This water, although cleaned can throw the ecosystem off. Please for our future and the future of our children, reconsider the environmental impact this could have a deny this permit.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 1:15 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: Diedregoodchild@gmail.com <Diedregoodchild@gmail.com>
Sent: Monday, February 27, 2023 12:48 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Diedre Goodchild

EMAIL: Diedregoodchild@gmail.com

COMPANY:

ADDRESS: 2130 ACACIA PKWY
SPRING BRANCH TX 78070-5658

PHONE: 2536539089

FAX:

COMMENTS: I request a public meeting. I am on a private well and depend on clean water. I am an affected person because of the location. This permit application should be denied. It is detrimental to the well being of the county. negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). negative impact on area streams and rivers (Dry Comal Creek, Comal River, Guadalupe River). No plan for beneficial reuse or land application (TLAP). Potential negative impact on area caves and caverns.

(5)

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Anna Goodwin

Mailing Address: 1227 MYSTIC CANYON, SPRING BRANCH, TX

Physical Address (if different): _____

City/State: SPRING BRANCH **Zip:** 78070

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: AVGOODWIN@hotmail.com

Phone Number: (830) 388-5617

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☐ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, June 7, 2023 3:10 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: gstar@gvtc.com <gstar@gvtc.com>
Sent: Wednesday, June 7, 2023 3:03 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Terry Graham

EMAIL: gstar@gvtc.com

COMPANY:

ADDRESS: 714 LOMA DOBLE
SPRING BRANCH TX 78070-6065

PHONE: 2107050485

FAX:

COMMENTS: Permit application should be denied. Potential negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). Potential negative impact on area springs, streams, and rivers (Dry Comal Creek, Comal River, Guadalupe River). A beneficial reuse or land application permit (TLAP) would be much better than a discharge permit. Potential negative impact on area caves and caverns.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 2:00 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: stacgreene3@gmail.com <stacgreene3@gmail.com>
Sent: Monday, February 27, 2023 8:23 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Stacie Greene

EMAIL: stacgreene3@gmail.com

COMPANY:

ADDRESS: 9039 OZARK TER
SAN ANTONIO TX 78266-2658

PHONE: 2816825518

FAX:

COMMENTS: I am requesting that this application be brought forward for a public meeting and not approved without hearing from affected residents. I am on a well water system that could be affected by the approval of this permit. The public needs to be informed and consulted in this approval process.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:35 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: Jgruesbeck@gmail.com <Jgruesbeck@gmail.com>
Sent: Saturday, February 25, 2023 12:09 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: JEANNE MARIE GRUESBECK

EMAIL: Jgruesbeck@gmail.com

COMPANY:

ADDRESS: 30043 CLOUD VIEW DR
BULVERDE TX 78163-4031

PHONE: 8309805875

FAX:

COMMENTS: I'm on a private well. This will directly affect me. Stop this from contaminating our area, we are not a dumping ground!

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 1:49 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: sheri_hannasch@outlook.com <sheri_hannasch@outlook.com>
Sent: Tuesday, February 28, 2023 7:22 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Sheri Ann Hannasch

EMAIL: sheri_hannasch@outlook.com

COMPANY:

ADDRESS: 1477 CHIANTI
NEW BRAUNFELS TX 78132-2947

PHONE: 2103732477

FAX:

COMMENTS: I am contacting you to ask you request a public meeting on TCEQ permit WQ0016211001. Dumping up to 600,000 gallons of treated sewage—every day—into the West Fork Dry Comal Creek and Dry Comal Creek, which flow into the Comal River in New Braunfels would be in adjacent with the Edwards Aquifer contributing zone and just 2000 feet upstream from the recharge zone treated sewage flowing into the Dry Comal Creek, and over the Edwards Aquifer, every single day!

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Denise Harris

Mailing Address: 1670 South Cranes Mill Road, New Braunfels TX 78130

Physical Address (if different):

City/State: New Braunfels, TX **Zip:** 78132

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: edharris55@yahoo.com

Phone Number: (830) 624-5050

- Are you here today representing a municipality, legislator, agency, or group? ☒ Yes ☐ No

  If yes, which one? Friends of Dry Comal Creek

☐ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.

(Written comments may be submitted at any time during the meeting) (See Back)

Please give this form to the person at the information table. Thank you.

I was involved in the Myer Ranch sewer treatment plant. TCEQ Docket No 2015-1624-MWD Docket No. 582-16-2586

This document was the settlement arbutrated with our group. My well is monitored by the Myer Ranch under the provisions in section 3.07 of this document. During testing, ecori and total coliform is high after the plant started operations. The Myer ranch permit holder for sewer treatment plant has refused to put a clorinator on my well. There are two other wells monitored which are on the Myer Ranch who always test negative. My well is down stream and has tested positive meultiple times. This permit is the same as the the Myer Ranch and the TCEQ is relying on an operater to report electronically results, but the operator always seems on the next round of testing to be negative. This well is tested once a year. I would deny this permit until TCEQ corrects their monitoring of sewage treatment plants.

DA.

(1)

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: ED HARRIS

Mailing Address: 1670 S CRAVES MILL RD

Physical Address (if different): _____

City/State: NEW BRAUNFELS **Zip:** 7813-

This information is subject to public disclosure under the Texas Public Information Act

Email: EDHARRIS58@YAHOO.COM

Phone Number: (210) 602 3899

- Are you here today representing a municipality, legislator, agency, or group? ☒ Yes ☐ No

  If yes, which one? FRIENDS OF DRY COMAL CREEK

☐ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:47 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: rob.hernandez911@gmail.com <rob.hernandez911@gmail.com>
Sent: Saturday, February 25, 2023 9:01 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Robert Hernandez

EMAIL: rob.hernandez911@gmail.com

COMPANY:

ADDRESS: 1623 MOUNTAIN SPGS
CANYON LAKE TX 78133-2362

PHONE: 2107104158

FAX:

COMMENTS: I request a public meeting.

(3)

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Richard Hillyer

Mailing Address: 393 Guada Coma

Physical Address (if different): _____

City/State: NB **Zip:** 78130

This information is subject to public disclosure under the Texas Public Information Act

Email: RDHillyer@hotmail.com

Phone Number: (713) 254-2459

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, June 7, 2023 2:12 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: davidmichaelhixon@gmail.com <davidmichaelhixon@gmail.com>
Sent: Wednesday, June 7, 2023 12:48 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: David M Hixon

EMAIL: davidmichaelhixon@gmail.com

COMPANY:

ADDRESS: 1205 KINNEY AVE Apt. E
AUSTIN TX 78704-2156

PHONE: 2105080650

FAX:

COMMENTS: Please do not approve this permit application, it would be environmentally disastrous. The proposed effluent path will flow from West Fork Dry Comal Creek, thence to Dry Comal Creek, thence to the Comal River at a volume of 600,000 gallons per day. According to the 2022 Texas Integrated Report, a TCEQ review summarizing the condition of Texas' surface waters, both Dry Comal Creek and Comal River are flagged as impaired waterbodies; meaning both these waterbodies' effluent limitations are not stringent enough to implement water quality standards. In 2010, Dry Comal Creek (Segment 1811A_01) was listed as impaired for bacteria in water (recreation use), and in 2016 Comal River (Segment 1811_01) was listed as impaired for bacteria in water (recreation use) as well. To address these

high bacteria levels, the Dry Comal Creek and Comal River Watershed Protection Plan (WPP) was developed to implement best management strategies (BMPs) to improve the water quality and quantity across this watershed area. Both the Dry Comal Creek and Comal River are essential natural resources in this geographic area, supporting economic development and recreation in New Braunfels, as well as agriculture operations throughout the area. GEAA encourages the protection and preservation of these two waterbodies and does not support activities that would further degrade the water quality and increase the quantity of low-quality water in this watershed region.

TCEQ Registration Form
June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Thomas Hodge

Mailing Address: 1951 Hunter Rd #17107

Physical Address (if different): _____

City/State: San Marcos TX **Zip:** 78666

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: tom.hodge@txwaterco.com

Phone Number: (830) 312-4600

- Are you here today representing a municipality, legislator, agency, or group? ☒ Yes ☐ No

  If yes, which one? Texas Water Company

☐ **Please add me to the mailing list.**

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

I support issuance of this permit as drafted. The draft permit is more than adequate to protect the environment.

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, June 8, 2023 12:22 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001
Attachments: TCEQ COMMENT.pdf

Please note, the attached pdf is a corrupted file and will not open. Matthew is sending us a scanned version in a separate email.

From: District09@edwardsaquifer.org <District09@edwardsaquifer.org>
Sent: Thursday, June 8, 2023 11:45 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: MR Matthew Edwin Hoyt

EMAIL: District09@edwardsaquifer.org

COMPANY: Edwards Aquifer Authority

ADDRESS: 900 E QUINCY ST
SAN ANTONIO TX 78215-1440

PHONE: 2547440312

FAX:

COMMENTS: Please see attached letter.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, June 8, 2023 12:33 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Cc: Laurie Gharis; Deornette Monteleone
Subject: FW: Comments on application

From: District 09 - Comal & Guadalupe Counties <district09@edwardsaquifer.org>
Sent: Thursday, June 8, 2023 12:20 PM
To: Brad Patterson <Brad.Patterson@tceq.texas.gov>
Subject: Comments on application

EDWARDS AQUIFER
AUTHORITY

June 8, 2023

Commissioners
Jon Niermann
Emily Lindley
Bobby Janecka
12100 Park 35 Circle
Austin, TX 78753
Case: WQ0016211001

As the Director of District 9 of the Edwards Aquifer Authority, as a former New Braunfels City Councilman, and as an owner of a business on the Comal River, I am opposed to Mr. Harrison's request for a new Texas Pollutant Discharge Elimination System.

Approval of this permit puts at risk not only a the fragile ecosystem of endangered species that rely upon a healthy aquifer, springs, and river, but also the businesses that rely on a clean river that is the lifeblood of the tourism industry in Comal County, New Braunfels and Western Guadalupe County.

Approval of this permit is anti-business, anti-environment, and anti-New Braunfels. Our community has worked hard to self-police, implementing such measures as the Disposable Container Ordinance, in order to protect wildlife, keep our rivers clean, and help us be good neighbors to our friends and partners downstream. Approval of this one application, from one person, could do more damage to the hill country and to our water system, than any other.

As you know The Texas Commission on Environmental Quality's Mission Statement is to "protect our state's public health and natural resources consistent with sustainable economic development. Our goal is clean air, clean water, and the safe management of waste." Approval of this permit would be in direct contradiction to the Commission's mission.

Please contact me if I can be of any assistance.

Sincerely,

Matthew E. Hoyt
Director- District 9

900 Quincy Street San Antonio, Texas 78215 254.744.0312

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Donna Hull

Mailing Address: 1870 Shearer Rd

Physical Address (if different): _____

City/State: Bulverde TX **Zip:** 78163

This information is subject to public disclosure under the Texas Public Information Act*

Email: donnalhull@hotmail.com

Phone Number: (210) 807-1500

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☐ No

  If yes, which one? _____

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

☒ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**
What do you consider a little amount is not harmful?
How is this regulated? Private/or Public see back

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

~~If~~

- Once you identify how many caves/caverns are on property, what is the distance that leads to the aquafer.

- How long will the existing wells be tested to ensure drinking water is safe and who will test the wells?
- What control is used during any floods not just the 100yr floor
- Is the public notified of test results taken by an "accredited TCEQ" personnel especially if results considered harmful.
- Is TCEQ paid by the plant?
- What if the permitee is not granted the reuse permit?
- Show me that the "microbiom" filtration to clarify the water is the highest standards according to the lady stated.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 2:20 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: ssrubar@hotmail.com <ssrubar@hotmail.com>
Sent: Monday, February 27, 2023 3:13 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Shelly Humphrey

EMAIL: ssrubar@hotmail.com

COMPANY:

ADDRESS: 5532 STRAUB RD
COLLEGE STATION TX 77845-6954

PHONE: 3617715240

FAX:

COMMENTS: I respectfully ask that you request a public meeting from TCEQ on wastewater discharge permit WQ0016211001. Some of my unanswered questions include: 1. Since the effluent will be flowing into and over the Edwards Aquifer Recharge Zone, what additional protections will be implemented? 2. Relative to other discharge permits in the Hill Country, 600,000 gallons per day represents a very high volume of effluent. Why such a high volume on this permit application? 3. Considering the proximity to EARZ and ultimate flow into the Comal River, what

alternatives (such as land use application or enhanced treatment/reduced volume) have been considered? A public meeting would give the developer and TCEQ an opportunity to present useful information to the public about their proposed plans. The public deserves to hear more about this before it's rubber stamped and our tourists are literally swimming in effluent. Thanks.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:46 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: callahantjordan@gmail.com <callahantjordan@gmail.com>
Sent: Saturday, February 25, 2023 8:10 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Cal Jordan

EMAIL: callahantjordan@gmail.com

COMPANY:

ADDRESS: 1800 FM 3424
CANYON LAKE TX 78133-2218

PHONE: 7138151365

FAX:

COMMENTS: The Comal River brings in a lot of tourism dollars to the town. Tourism is the main industry in New Braunfels, and I don't think many people would want to float the river knowing that a substantial amount of wastewater, even if treated, was being dumped in it. Treatment does not filter out all contaminants such as phosphorus or all E. Coli. These would be harmful to our beautiful clear river and the people who float it. Not to mention all of the native species in the river. The water would be threatened by algae caused by phosphorus, thus making it even more

unwelcoming to swim in. Our community wants answers and I think a public meeting would be very beneficial. I believe we need to protect our natural resources and keep New Braunfels beautiful.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, June 8, 2023 8:28 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: lisalosassojackson@gmail.com <lisalosassojackson@gmail.com>
Sent: Thursday, June 8, 2023 7:21 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: MRS Lisa Jackson

EMAIL: lisalosassojackson@gmail.com

COMPANY:

ADDRESS: 839 MISSION HILLS DR
NEW BRAUNFELS TX 78130-6673

PHONE: 5122177408

FAX:

COMMENTS: Edwards Aquifer contributing and recharge zones are the worst place to dump 600,000 gallons (an Olympic-size swimming pool) of treated sewage every day. This doesn't even make sense. The Hill Country will be known as Waste Country and maybe even worse. How about Poop Zone? How about S*#t Country? The point is that this idea is so outrageously irresponsible that it's hard to fathom a logical explanation. Oh, except money. Some are making a ton of it. TCEQ needs to do the job of protecting our environment. Because, that's what you're supposed to do. This area is known for its beauty. The unprecedented growth and tourism are connected to its appeal. We must protect it. What is the end game? Destruction of our natural resources? There are unanswered questions - this is unacceptable, negligent,

and irresponsible. Permit application should be denied. Why? Because of the potential negative impact on our area water wells, Edwards Aquifer, Trinity Aquifer, streams, and rivers. This could also affect caves and caverns. What if any analysis has been done on the potential impact? What are the short term and long term affects? How will dumping treated sewage every day benefit this area? From what I understand, there are multiple errors in the permit application. How well did TCEQ review? The Hill Country is already being destroyed by quarries. Is the intention to turn this area into the destruction zone? Wasteland? People will not live OR visit here and enjoy its beauty if we don't do everything we can to protect it. That has financial implications as well. How will this affect the overall ecosystem? Destroy, build, and leave is the approach to all of this development. This must stop.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:01 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: thekantars@yahoo.com <thekantars@yahoo.com>
Sent: Sunday, February 26, 2023 12:42 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Erica Kantar

EMAIL: thekantars@yahoo.com

COMPANY:

ADDRESS: 245 OAK RIDGE DR
NEW BRAUNFELS TX 78132-3026

PHONE: 9167176600

FAX:

COMMENTS: I am requesting a public meeting. Please deny this permit because it would allow pollution of our drinking water. No amount of money is worth that.

TCEQ Registration Form
June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Colleen Kilford

Mailing Address: 1330 Stonewall

Physical Address (if different): _____

City/State: NB **Zip:** 78130

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: CKilford.48@gmail.com

Phone Number: (512) 626-8028

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☑ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Who vetted Doug Harrison to be operator/owner of treatment plant — the monitoring of 3-5yr is completely inadequate they monitor themselves!!!

Please give this form to the person at the information table. Thank you.

Jennifer Cox

From:	PUBCOMMENT-OCC
Sent:	Tuesday, October 8, 2024 1:10 PM
To:	PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject:	FW: Public comment on Permit Number WQ0016211001

From: ryan_klebba@steris.com <ryan_klebba@steris.com>
Sent: Saturday, October 5, 2024 8:31 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Ryan Klebba

EMAIL: ryan_klebba@steris.com

COMPANY:

ADDRESS: 1522 CIRCOLARE
NEW BRAUNFELS TX 78132-1887

PHONE: 5122894469

FAX:

COMMENTS: The discharge limit granted is way over necessary and should match that of Meyer Ranch at 100%. This is irresponsible for our creeks and groundwater which serves over 2 million people in the Austin San Antonio I-35 corridor. If this is granted the ramifications after the dumping will be great and it will be too late to address the issue as the damage will already be done. Hold these companies responsible to protect the citizens that so heavily depend on good water conditions.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, March 1, 2023 2:14 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: Bonjermama@hotmail.com <Bonjermama@hotmail.com>
Sent: Wednesday, March 1, 2023 9:43 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Chris Kostrzewa

EMAIL: Bonjermama@hotmail.com

COMPANY:

ADDRESS: 709 DEEP WATER DR
SPRING BRANCH TX 78070-6049

PHONE: 5126300433

FAX:

COMMENTS: We are residents of Comal county and respectfully request a public meeting to address the referenced permit to discharge waste water into Dry Comal Creek. We are in opposition to this permit based in the negative effect it will have on the precious water resources in the hill country.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, March 2, 2023 1:50 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: Bonjermama@hotmail.com <Bonjermama@hotmail.com>
Sent: Wednesday, March 1, 2023 9:53 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Chris Kostrzewa

EMAIL: Bonjermama@hotmail.com

COMPANY:

ADDRESS: 709 DEEP WATER DR
SPRING BRANCH TX 78070-6049

PHONE: 5126300433

FAX:

COMMENTS: We are residents of Comal county and respectfully request a public meeting to address the referenced permit to discharge waste water into Dry Comal Creek. We are in opposition to this permit based in the negative effect it will have on the precious water resources in the hill country.

Jennifer Cox

From:	PUBCOMMENT-OCC
Sent:	Tuesday, October 8, 2024 1:10 PM
To:	PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject:	FW: Public comment on Permit Number WQ0016211001

From: Jkoosh50@yahoo.com <Jkoosh50@yahoo.com>
Sent: Saturday, October 5, 2024 8:33 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: John C Kucewicz, JR

EMAIL: Jkoosh50@yahoo.com

COMPANY:

ADDRESS: 1659 STATE HIGHWAY 46 W #115-602
NEW BRAUNFELS TX 78132-4744

PHONE: 8308854555

FAX:

COMMENTS: I stand in opposition to the current permit allowances. They are too high for discharge amounts of volumes and constituents. I am a master degreed Earth Scientist having worked both for and against projects that involve these very characteristics

(4)

TCEQ Registration Form

June 8, 2023

#4

Speaker #4

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Brandon Kuhn

Mailing Address: 8625 FM 1863 #2 San Antonio, TX 78266

Physical Address (if different): _____

City/State: SA **Zip:** 78266

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: SpiritControl7@gmail.com

Phone Number: (830) 730-2405

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☐ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.** #4

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

(19)

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT (19)

Name: Helen + Danny Lammert

Mailing Address: 105 Gentry Point Hutto, Texas 78634

Physical Address (if different): Ranch at FM 1863

City/State: Bulverde **Zip:** 78266

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: helen_lammert@hotmail.com

Phone Number: (512) 944-7408

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☒ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

WQ0016211001

& Uecker

Schinedanz, Zuercher, Froboese probably means little to the majority of you present this evening. Those are my ancestors who established our family ranch which has been in the family for more than 150 years.

Reviewed By Gaw

AUG 20 2024

Today, our family ranch is owned by a Froboese, a Kuhn and a Lammert, but to me it will always be known as the Zuercher Ranch in honor of my grandfather and great-grandfather. The ranch was their heart and soul.

Today, it is being threatened once again by a water permit releasing 600,000 gallons of treated water every day into the Dry Comal Creek which bisects our ranch.

This decision threatens the equality & quantity of our water in our

5 private water wells as well as the water flows downstream to New Braunfels.

Is this treated water safe for our cattle, goats, dogs, chickens? If it is safe, why not use the treated water to water the lawns or other uses in the subdivision? Our family ranch is home to several caves. I personally was in one cave in 1973, going down by rope ladder 60 feet to dry rocks and bat guano. Last year, I once again entered the cave using more modern equipment from our local Grotto club. My hope was to see a beautiful waterfall, discovered by my nephew, John. My ultimate goal was to see the waterfall and to drink a sip of pure water as my nephew had stated it was some of the best water he'd tasted. When I finally got close to my goal, I felt going down a narrow opening and then using a rope to get to the Faith Room, as named by my nephew, was more than my strength could endure. I didn't make it to that fresh

clean water he'd spoken of. What will this release do to that groundwater?

Speaking of the water flow, what will the releases do to our fences? I'm not sure how many in this audience have built fence but my family has. One of the more difficult sections to fence is the areas that cross the creekbeds like the Dry Comal and the Cibolo. We call them water gaps and have to bust rock to create holes for the permanent fence posts and string up sections of fence that are designed to blow open during the times when the water comes down the creeks such as heavy rains and floods. Will these releases create a need for constant fence repair? Has TCEQ ever built fence? Will they come fix our fence after every release? Or have they not even considered the impacts their plant will have on the surrounding area?

Helen Lamment
512-444-7408
~~FM~~ 7490 FM 1863
83-- FM 1863
helen-lamment@hotmail

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

August 20, 2024

Brad Patterson
Office of the Chief Clerk
Texas Commission on Environmental Quality
P.O. Box 13087, MC-105
Austin, Texas 78711-3087

Reviewed By GCM
AUG 20 2024

RE: Correspondence Update

TPDES Permit No. WQ0016211001

Dear Mr. Patterson:

Attached to this cover page is additional contact information for Helen Lammert which was provided to ED staff at the public meeting for the application TPDES Permit WQ0016211001. Please include the contact information for your records.

Sincerely,

Cole Malley, Staff Attorney - Environmental Law Division

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
2024 AUG 20 PM 1:52
CHIEF CLERKS OFFICE

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 1:48 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: Mmlantzy@hotmail.com <Mmlantzy@hotmail.com>
Sent: Tuesday, February 28, 2023 8:35 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Missy Lantzy

EMAIL: Mmlantzy@hotmail.com

COMPANY:

ADDRESS: 20515 WAHL LN
GARDEN RIDGE TX 78266-2550

PHONE: 2106513531

FAX:

COMMENTS: There should be a public meeting before moving forward. This permit should not even be considered without public input.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:38 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: mlensink@icloud.com <mlensink@icloud.com>
Sent: Saturday, February 25, 2023 1:03 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Michael Lensink

EMAIL: mlensink@icloud.com

COMPANY:

ADDRESS: 2238 PINOT BLANC
NEW BRAUNFELS TX 78132-4800

PHONE: 8473669751

FAX:

COMMENTS: Hello, Please have a public meeting on this matter. As a citizen close to Dry Comal Creek, we have concerns about the impact of this wastewater discharge. There are many unanswered questions regarding the environmental impact that this discharge will have. Some of these concerns are as follows: Potential negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). Potential negative impact on area streams and rivers (Dry Comal Creek, Comal River, Guadalupe River). No plan for beneficial reuse or land application (TLAP). Potential

negative impact on area caves and caverns. We feel this permit should be denied. Thank you for your consideration, Michael and Terrie Lensink.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Friday, June 9, 2023 9:08 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: manuel34@satx.rr.com <manuel34@satx.rr.com>
Sent: Thursday, June 8, 2023 4:04 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: MANUEL B LONGORIA

EMAIL: manuel34@satx.rr.com

COMPANY:

ADDRESS: 31035 RETAMA RDG
BULVERDE TX 78163-4155

PHONE: 2106699558

FAX:

COMMENTS: i live in comal county,, RIm Rock Ranch,, what i am hearing about this company ,,, i would not recommend this company,,, get another one,,

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:04 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: Michael.lothrop@sbcglobal.net <Michael.lothrop@sbcglobal.net>
Sent: Sunday, February 26, 2023 2:56 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Christina Lothrop

EMAIL: Michael.lothrop@sbcglobal.net

COMPANY:

ADDRESS: 8003 CORNWALL DR
SPRING BRANCH TX 78070-7224

PHONE: 2108007598

FAX:

COMMENTS: I do not approve and deny this application

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, June 8, 2023 12:18 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: gmalatek@newbraunfels.gov <gmalatek@newbraunfels.gov>
Sent: Thursday, June 8, 2023 10:00 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: MR Greg A. Malatek

EMAIL: gmalatek@newbraunfels.gov

COMPANY: City of New Braunfels

ADDRESS: 550 LANDA ST
NEW BRAUNFELS TX 78130-6110

PHONE: 8302214025

FAX:

COMMENTS: The City of New Braunfels, along with local stakeholders, has developed and is currently implementing a Watershed Protection Plan (WPP) for both the Dry Comal Creek and Comal River. Both waterways are currently listed in the 2022 Texas Integrated Report of Surface Water Quality for Clean Water Act Sections 305(b) and 303(d) report as being impaired by bacteria for contact recreational use. The development phase of the WPP began in 2015 and implementation phase began in 2018. Both phases of WPP have been partially funded by the Texas Commission on Environmental Quality and the United States Environmental Protection Agency. As a part of the Clean Rivers Program, the Guadalupe Blanco River Authority samples these waterways monthly and provides bacteria count data to the City.

The data collected is utilized to guide the implementation efforts of the WPP. The City is requesting clarification on how this proposed discharge will affect the developed WPP.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Friday, June 9, 2023 9:05 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: mannyovnpoa@gmail.com <mannyovnpoa@gmail.com>
Sent: Thursday, June 8, 2023 4:56 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Manuel Maldonado

EMAIL: mannyovnpoa@gmail.com

COMPANY: Bulverde Neighborhood Alliance

ADDRESS: 4852 SPREADING OAK DR
BULVERDE TX 78163-2763

PHONE: 5124703829

FAX:

COMMENTS: We, the Bulverde Neighborhood Alliance, formally submit our comments to voice our concerns regarding the wastewater treatment plant for the Harrison Ranch (Permit Application# WQ0016211001). The Bulverde Neighborhood Alliance is an environmental group dedicated to upholding the water, land, and air quality of the Greater Bulverde, Texas area. Many of our members rely on well water and/or minimally treated water pumped from the Glen Rose, Trinity, and Edwards Aquifers which lie beneath the discharge point. Our wells are classified by the TCEQ as GUI or "groundwater under the influence of surface water," so discharge will most likely affect our bathing and drinking water, as well as our way of life. These wells service the community of Oak Village North, a subdivision with 700+ homes that

serves roughly 2500 residents. The applicant has not provided evidence as to how they will protect known karst and recharge features downstream from the proposed building and discharge sites, as per determined by Dr. George Veni of the National Cave and Karst Research Institute. The applicant has not demonstrated that the discharge is protective of surface water quality. The discharge will flow into sensitive recharge areas. The discharge will potentially worsen this impairment of bacteria, and will potentially cause or contribute to eutrophication of sensitive hill country streams. The discharge will also potentially degrade water quality due to the discharge of per- and polyfluoroalkyl substances (PFAS). The discharge of these constituents has not been adequately addressed in the permit. The applicant, nor the TCEQ, have not taken into account the cumulative effects of effluent discharge into tributaries and creeks of the Cibolo Creek watershed, a known aquifer recharge zone. As of today, wastewater treatment plants built in the Bulverde ETJ over the past ten years are poised to dump up to 2,805,000 gallons of treated wastewater per day. This permit would push this number up to 3,405,000 gpd of treated wastewater. This number does not take into account the Copper Canyon Subdivision, just south of the Bulverde ETJ. The applicant has not demonstrated that the proposed facility is compliant with the regionalization policy of the Texas Water Code and the TCEQ. Applicant has not demonstrated that a need exists for the facility and discharge. Odor created by the wastewater has also not been adequately addressed. The applicant has not demonstrated that the facility complies with the suitability requirements of 30 TAC § 309.13. Applicant has not demonstrated that this regulation is met with regards to the proximity of the facility to the flood plain, aquifer recharge zones, or odor control. The applicant has not demonstrated that the proposed discharge is protective of subterranean aquatic life or wildlife, including endangered and threatened species. OVER 100 HOMES ARE SET TO BE BUILT IN A KNOWN FLOOD PLAIN. The discharge will also bring unwanted wildlife to the area, such as wild hogs, and increase the toxicity levels or rainwater runoff caused by concentrated feces, carcasses, and other animal debris.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:03 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: lcmcmurray@hotmail.com <lcmcmurray@hotmail.com>
Sent: Sunday, February 26, 2023 2:02 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Lynda McMurray

EMAIL: lcmcmurray@hotmail.com

COMPANY:

ADDRESS: 2317 LOMBARDY
NEW BRAUNFELS TX 78132-1872

PHONE: 7033040757

FAX:

COMMENTS: I am requesting a public meeting on this permit before it is approved. The Permit application should be denied. Potential negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). Potential negative impact on area streams and rivers (Dry Comal Creek, Comal River, Guadalupe River). No plan for beneficial reuse or land application (TLAP). Potential negative impact on area caves and caverns.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Friday, June 9, 2023 11:22 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: dkmcpheeters@aol.com <dkmcpheeters@aol.com>
Sent: Friday, June 9, 2023 11:11 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Debbie McPheeters

EMAIL: dkmcpheeters@aol.com

COMPANY:

ADDRESS: PO BOX 278
BULVERDE TX 78163-0278

PHONE: 2104143576

FAX:

COMMENTS: I attended the public meeting on June 8th. I didn't hear of any preperations made for the loss of power or the danager of flooding. Will there be any generators for the pumping station or a cemented retention pond on the property? I understand the small amount in the creek but I would like to point out that every subdivision will add to that until there is a real problem. I think it should be a requirement to have the ponds on the property and generators for the pumping station. I would also think that the wastewater company should be a local company not out of CO. We need and should demand a watchful eye that has an interest in our water. I would like to know why the wastewater company is allowed to do there on testing? Isn't that like the fox watching the hen house? This permit should be denied until

these measures are addressed and the public is aware of the measures. If one subdivision is allowed to get by with this then others will follow. We should all be responsible landowners. My experieince with the people that move into county subdivisions has shown that the people have no knowledge of the environment or problems that can be caused by treating the property like it is a city subdivision. When we moved into the hill country some 25+ years ago we had to manage water and waste on our own property as not to harm neighbors or the community the subdivision should have to do the same. Meyers Ranch was noted to be a problem do we really want to repeat the mistake? This permit should be denied.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, June 8, 2023 1:39 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: dkmcpheeters@aol.com <dkmcpheeters@aol.com>
Sent: Thursday, June 8, 2023 12:50 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Debbie McPheeters

EMAIL: dkmcpheeters@aol.com

COMPANY:

ADDRESS: PO BOX 278
BULVERDE TX 78163-0278

PHONE: 2104143576

FAX:

COMMENTS: This is a personal issue for me due to my waterwell. I would like to comment on the following items. 1)Permit application should be denied. 2)Potential negative impact on area springs, streams, and rivers. 3)Potential negative impact on groundwater quality. 4)Potential negative impact on area caves and caverns. 5)What endangered species will be impacted? 6)Multiple errors in permit application. How well did TCEQ review? We must wake up just because you can doesn't mean you should. One landowner should not be allowed to trump all other landowners rights. You are jepordizing my quality of life, my water, the wildlife and caverens. What will happen when we have the next flood? How will that damage be contained? It won't and the people that approve this will not be affected and will not do

anything about it. This permit should be deniied and TCEQ should have better guide lines for this type of action. You will not be able to correct the actions of your approval the land will never be the same and you will damage the land and the water. Will you pay for my new well or supply a means of clean drinking water? I didn't think so. The subdivision is going to cut the amount of water that would have gone into the recharge zone. What will the next drought look like? Do what is right for the future generations. We continue to build in this area which means more people more schools more stores but will the water supply all that. And everytime we build subdivisions we need new schools which increase our taxes(which happen to be very high) so they can be maintained. This horrible circle is insane. Destroying our land and water resources is insane. For our future you must stop this!

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, March 1, 2023 2:15 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: dkmcpheeters@aol.com <dkmcpheeters@aol.com>
Sent: Wednesday, March 1, 2023 11:25 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Debbie McPheeters

EMAIL: dkmcpheeters@aol.com

COMPANY:

ADDRESS: PO BOX 278
BULVERDE TX 78163-0278

PHONE: 2104143576

FAX:

COMMENTS: Permit application should be denied. Potential negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). Potential negative impact on area streams and rivers (Dry Comal Creek, Comal River, Guadalupe River). No plan for beneficial reuse or land application (TLAP). Potential negative impact on area caves and caverns.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:08 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: falloutsis@yahoo.com <falloutsis@yahoo.com>
Sent: Monday, February 27, 2023 8:20 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Gloria Meehan

EMAIL: falloutsis@yahoo.com

COMPANY:

ADDRESS: 828 RAMBLEWOOD DR
CANYON LAKE TX 78133-4713

PHONE: 9178480467

FAX:

COMMENTS: I am requesting a public meeting regarding this proposed permit. Although I do not live in the area directly affected by this proposed discharge location, that would potentially be right over the Edwards Aquifer contributing zone and just 2000 feet upstream from the recharge zone, to try and push this plan through without even holding a public meeting is uncalled for! Regardless, this permit application should be denied for the following reasons, among others: The potential negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). Potential

negative impact on area streams and rivers (Dry Comal Creek, Comal River, Guadalupe River). There is no plan for beneficial reuse or land application (TLAP). Potential negative impact on area caves and caverns. Deny this permit and protect our water sources.

(9)

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Sarah Mercer

Mailing Address: 106 Cielo Vista, Canyon Lake, TX 78133

Physical Address (if different): _____

City/State: _____ **Zip:** _____

This information is subject to public disclosure under the Texas Public Information Act

Email: Smercer07@outlook.com

Phone Number: (512) 796-518

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☒ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, June 7, 2023 9:08 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: saveourhillcountry@gmail.com <saveourhillcountry@gmail.com>
Sent: Wednesday, June 7, 2023 9:06 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Sarah Mercer

EMAIL: saveourhillcountry@gmail.com

COMPANY:

ADDRESS: 1659 STATE HIGHWAY 46 W STE 115 #449
NEW BRAUNFELS TX 78132-4745

PHONE: 2105706262

FAX:

COMMENTS: As noted in the Notice of Receipt of Application, Intent to Obtain Water Quality Permit, Notice of Application, and Preliminary Decision for TPDES Permit for Municipal Wastewater, the proposed discharge route is from the plant site to West Fork Dry Comal Creek, thence to Dry Comal Creek, thence to the Comal River in Segment No. 1811 of the Guadalupe River Basin According to the 2022 Texas Integrated Report, a TCEQ review summarizing the condition of Texas' surface waters, both Dry Comal Creek and Comal River are flagged as impaired waterbodies; meaning both these waterbodies' effluent limitations are not stringent enough to implement water quality standards. In 2010, Dry Comal Creek (Segment 1811A_01) was listed as impaired for bacteria in water (recreation use), and in 2016 Comal River

(Segment 1811_01) was listed as impaired for bacteria in water (recreation use) as well. To address these high bacteria levels, the Dry Comal Creek and Comal River Watershed Protection Plan (WPP) was developed to implement best management strategies (BMPs) to improve the water quality and quantity across this watershed area. You can read the WPP at https://bit.ly/ComalWPP. the location of the facility is in the Edwards Aquifer Contributing Zone (about 2000 feet from the Edwards Aquifer Recharge Zone). There is a cave on the Harrison property and more caves on surrounding properties. It is very likely if an Olympic-sized swimming pool of sewage is discharged into the area a day, at least some of it would end up in the aquifer due to erorison and dissolution. A map of these features can be found at https://bit.ly/harrisongeomap. Comal Springs that feed the headwaters of the Comal River is water from the Edwards Aquifer. In July 2020, the City of San Antonio Parks and Recreation Department, the Edwards Aquifer Protection Program, and the San Antonio River Authority commissioned a study by the Southwest Research Institute to create a flow model for how discharge from a TDPES on the Edwards Aquifer contributing and recharge zones in Bexar County, which is experiencing similar development pressures. They presented an integrated hydrologic transport representation that provides the means to simulate solute transport and evaluate the scenarios needed for wastewater disposal facility evaluation in the Contributing Zone that should be considered. You can find this modeling at You can find this modeling at https://bit.ly/EAPPmodel. Dry Comal Creek and Comal River are essential natural resources for this geographic area that are public water supplies. supporting economic development and the surface primary contact recreation as well as agriculture operations throughout the area. The approval of this permit as-is will most likely result in the degradation of these three bodies of water in violation of and supported by the WPP and EAPP modeling. A tier 2 anti-degradation review should be conducted on this project to ensure it will not result in an increase in pollution on Dry Comal Creek and the Comal River to ensure further impairment of these surface bodies of water. Rule 30 TAC §307.5 states discharges that cause pollution that are authorized by the Texas Water Code, the Federal Clean Water Act, or other applicable laws must not lower water quality to the extent that the Texas Surface Water Quality Standards are not attained. The Edwards Aquifer is the primary source of drinking water for two million people in the San Antonio area, so contamination of this resource would have a resounding impact far beyond the Harrison Tract site). TCEQ has a duty under TWC 26.401 to ensure discharges of pollutants, disposal of wastes, or other activities subject to regulation by state agencies be conducted in a manner that will maintain present uses and not impair potential uses of groundwater or pose a public health hazard.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, June 6, 2023 10:11 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001
Attachments: Harrison TPDES Map.pdf

From: smercer07@outlook.com <smercer07@outlook.com>
Sent: Monday, June 5, 2023 11:19 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Sarah Mercer

EMAIL: smercer07@outlook.com

COMPANY:

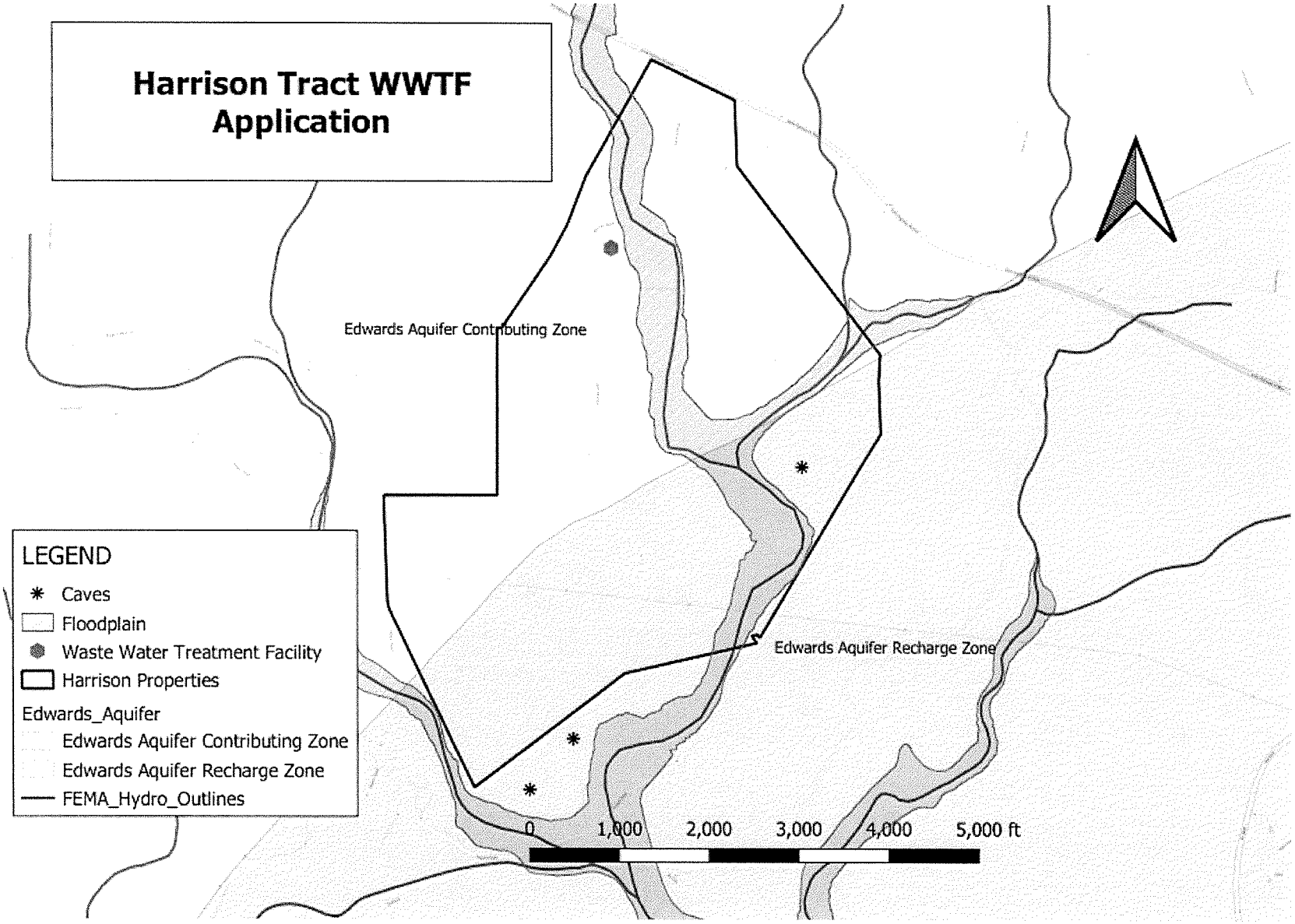
ADDRESS: 1659 STATE HIGHWAY 46 W STE 115 #449
NEW BRAUNFELS TX 78132-4745

PHONE: 2105706262

FAX:

COMMENTS: 30 Texas Administrative Code Chapter 309 Subchapter B establishes minimum standards for the location of domestic wastewater treatment facilities. 30 TAC §309.11 defines the following: "Active geologic processes" are "any natural process which alters the surface and/Accor subsurface of the earth, including, but not limited to, erosion (including shoreline erosion along the coast), submergence, subsidence, faulting, karst formation, flooding in alluvial flood wash zones, meandering river bank cutting, and earthquakes. "Aquifer" is "a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs." "Erosion"

is "the group of natural processes, including weathering, deterioration, detachment, dissolution, abrasion, corrosion, wearing away, and transportation, by which earthen or rock material is removed from any part of the earth's surface." In July 2020, the City of San Antonio Parks and Recreation Department, the Edwards Aquifer Protection Program, and the San Antonio River Authority commissioned a study by the Southwest Research Institute to create a flow model for how discharge from a TDPES on the Edwards Aquifer contributing and recharge zones in Bexar County, which is experiencing similar development pressures. They presented an integrated hydrologic transport representation that provides the means to simulate solute transport and evaluate the scenarios needed for wastewater disposal facility evaluation in the Contributing Zone that should be considered. You can find this modeling at bit.ly/EAPPmodel. There is a cave on the Harrison property and more caves on surrounding properties. Also, the location of the facility is in the Edwards Aquifer Contributing Zone (about 2000 feet from the Edwards Aquifer Recharge Zone). A map of these features can be found at https://bit.ly/harrisongeomap. The commission should not issue a permit for a new facility unless it finds that the proposed site when evaluated in light of the proposed design, construction, or operational features, minimizes possible contamination of water in the state. The Edwards Aquifer is the primary source of drinking water for two million people in the San Antonio area, so contamination of this resource would have a resounding impact far beyond the Harrison Tract site. In making this determination, the commission should consider the following factors before issuing the permit under rule 30 TAC §309.12: (1) active geologic processes; (2) groundwater conditions such as groundwater flow rate, groundwater quality, length of the flow path to points of discharge, and aquifer recharge or discharge conditions; (3) soil conditions such as stratigraphic profile and complexity, hydraulic conductivity of strata, and separation distance from the facility to the aquifer and points of discharge to surface water in the state; and (4) climatological conditions. Caves are formed by the active geological processes of erosion and dissolution. Erosion occurs when natural forces, such as water, wind, and ice, wear away the surface of rocks and soil. Dissolution occurs when certain types of rocks, such as limestone or dolomite, are dissolved by water containing carbon dioxide, forming caves. The dissolution process is responsible for the formation of most caves. When rainwater seeps through the ground, it absorbs carbon dioxide from the soil and becomes slightly acidic. This acidified water can dissolve minerals from the rock, creating small openings in the ground. Over time, these openings can become larger, eventually leading to the formation of caves. Erosion also plays a role in the formation of caves. The movement of water and other natural forces can wear away the surface of the rock, creating cracks and crevices that may eventually become caves. Erosion can also contribute to the widening and shaping of existing caves. Evaluation of the site to ensure water in the state is protected should include, but not be limited to the following analyses: Hydrogeological Survey: A hydrogeological survey is required to evaluate the groundwater resources near the wastewater facility. This survey will provide information on the characteristics of the aquifer, including its depth, extent, quality, and recharge rates. Soil Analysis: A soil analysis is performed to determine the capacity of the soil to absorb and treat wastewater discharged from the facility. This analysis evaluates the soil's texture, structure, permeability, moisture, and nutrient content. Geologic Evaluation: A geologic evaluation assesses the geologic characteristics of the area where the wastewater facility will be located. This evaluation will identify any geological hazards, such as unstable or reactive soils, karst formations, or fault lines. Stormwater Analysis: A stormwater analysis determines the impact of runoff from the wastewater facility on the environment. This analysis assesses the potential for erosion and sedimentation, as well as the potential for contaminant transport to surface waters. Fate and Transport Modeling: Fate and transport modeling is a process used to predict the behavior of wastewater contaminants in the environment. This modeling evaluates the potential for groundwater contamination, as well as the concentration and fate of pollutants in surface water bodies.


Harrison Tract WWTF Application
Edwards Aquifer Contributing Zone
Edwards Aquifer Recharge Zone
LEGEND
Caves
Floodplain
Waste Water Treatment Facility
Harrison Properties
Edwards_Aquifer
Edwards Aquifer Contributing Zone
Edwards Aquifer Recharge Zone
FEMA_Hydro_Outlines
0
1,000
2,000
3,000
4,000
5,000 ft

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, May 31, 2023 7:21 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: smercer07@outlook.com <smercer07@outlook.com>
Sent: Tuesday, May 30, 2023 11:10 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Sarah Mercer

EMAIL: smercer07@outlook.com

COMPANY:

ADDRESS: 1659 STATE HIGHWAY 46 W STE 115 #449
NEW BRAUNFELS TX 78132-4745

PHONE: 2105706262

FAX:

COMMENTS: According to TCEQ's own instructions for TPDES permits, whoever has overall responsibility for the operation of the facility must apply for the permit as a co-applicant with the facility owner (30 TAC §305.43). Mr. Harrison is listed as the owner of the facility in Section 9 of the permit, which is not accurate. SJWTX, Inc. appears to be the one who will be operating the plant based off the SPIF. Because SJWTX, Inc. will be operating the facility, they should be listed on the application. Otherwise, who would be held responsible for carrying out the standards of the permit? This application is inadequate and should be denied. (For reference - TCEQ Instructions for completing a TPDES permit https://www.tceq.texas.gov/downloads/permitting/wastewater/forms-tools/10053ins.docx)

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, May 31, 2023 7:20 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001
Attachments: Species List_ Austin Ecological Services Field Office.pdf

From: smercer07@outlook.com <smercer07@outlook.com>
Sent: Tuesday, May 30, 2023 11:43 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Sarah Mercer

EMAIL: smercer07@outlook.com

COMPANY:

ADDRESS: 1659 STATE HIGHWAY 46 W STE 155 #449
NEW BRAUNFELS TX 78132-4748

PHONE: 2105706262

FAX:

COMMENTS: Has TCEQ ensured that the proposed activity will not jeopardize the continued existence of any listed species or destroy or adversely modify any designated critical habitat.? Failure to comply with ESA regulations can result in legal consequences, enforcement actions, and penalties. Attached is an official species list, which is a letter from the local U.S. Fish and Wildlife Service field office that assists in the evaluation of potential impacts of this project. It includes a list of species that should be considered under Section 7 of the Endangered Species Act (ESA), a project tracking number, and other pertinent information from the field office. The purpose of the Act is to provide a means whereby

threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat. The ESA protects endangered and threatened species and their habitats by prohibiting the "take" of listed animals and the interstate or international trade in listed plants and animals, including their parts and products, except under federal permit. It is unlawful for a person to take a listed animal without a permit. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." Through regulations, the term "harm" is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12. If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF. You can view an online version of the information used to create the letter here: https://ipac.ecosphere.fws.gov/project/YUKSUZFZ2BB2PMTYT24KZLQXZU/index

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Austin Ecological Services Field Office
1505 Ferguson Lane
Austin, TX 78754-4501
Phone: (512) 937-7371

In Reply Refer To:
Project Code: 2023-0087547
Project Name: Harrison Tract WWTF

May 31, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Austin Ecological Services Field Office
1505 Ferguson Lane
Austin, TX 78754-4501
(512) 937-7371

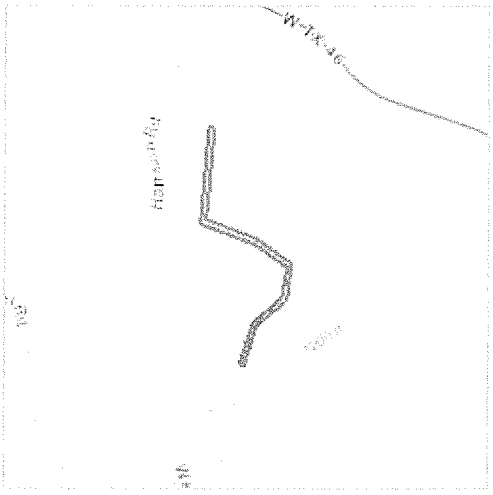
PROJECT SUMMARY

Project Code: 2023-0087547
Project Name: Harrison Tract WWTF
Project Type: Wastewater Facility - New Construction
Project Description: There is a proposed permit for a new wastewater facility in this area. The mapped area is for about 1 mile of discharge into the West Fork of Dry Comal Creek. Typically, TCEQ who is issuing this permit on behalf of the US EPA (FRS # is 1100071335567), only considers one mile for the affected party zone (even though that is not any documented rule or statute).

This is a very sensitive area include the Edwards Aquifer contributing and recharge zones. You can read about the sensitive nature of the watershed at https://bit.ly/ComalWPP. An olympic-sized dump of treadted sewage daily is going to have profound consequences for this currently thriving ecosystem. Can you please look into this?

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@29.77149745,-98.32163221477094,14z



Counties: Comal County, Texas

ENDANGERED SPECIES ACT SPECIES

There is a total of 14 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Golden-cheeked Warbler *Setophaga chrysoparia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/33	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

AMPHIBIANS

NAME	STATUS
San Marcos Salamander *Eurycea nana* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6374	Threatened

FISHES

NAME	STATUS
Fountain Darter *Etheostoma fonticola* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5858	Endangered

CLAMS

NAME	STATUS
False Spike *Fusconaia mitchelli* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3963	Proposed Endangered
Guadalupe Orb *Cyclonaias necki* Population: There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.	Proposed Endangered

INSECTS

NAME	STATUS
Comal Springs Dryopid Beetle *Stygoparnus comalensis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7175	Endangered
Comal Springs Riffle Beetle *Heterelmis comalensis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3403	Endangered
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRUSTACEANS

NAME	STATUS
Peck's Cave Amphipod *Stygobromus (=Stygonectes) pecki* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8575	Endangered

FLOWERING PLANTS

NAME	STATUS
Bracted Twistflower *Streptanthus bracteatus*	Threatened
There is **final** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/2856	
Texas Wild-rice *Zizania texana*	Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/805	

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Sarah Mercer
Address: 1659 State Hwy. 46 W 115
Address Line 2: Ste. 449
City: New Braunfels
State: TX
Zip: 78132
Email smercer07@outlook.com
Phone: 2105706262

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Environmental Protection Agency
Name: Greg Valentine
Email: valentine.greg@epa.gov

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:35 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: ellen.meyer415@gmail.com <ellen.meyer415@gmail.com>
Sent: Saturday, February 25, 2023 12:15 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Ellen Meyer

EMAIL: ellen.meyer415@gmail.com

COMPANY:

ADDRESS: 1020 MOUNTAIN LAUREL DR
NEW BRAUNFELS TX 78132-3482

PHONE: 7134090313

FAX:

COMMENTS: I have a private well on my property and my water comes from the Edwards Aquifer. I respectfully ask that you request a public meeting from TCEQ on wastewater discharge permit WQ0016211001 as the wastewater discharge could affect my water quality. Thank you.

Jennifer Cox

From:	PUBCOMMENT-OCC
Sent:	Tuesday, October 8, 2024 1:10 PM
To:	PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject:	FW: Public comment on Permit Number WQ0016211001

From: MONAHANPEM@gmail.COM <MONAHANPEM@gmail.COM>
Sent: Saturday, October 5, 2024 9:27 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Patrick Monahan

EMAIL: MONAHANPEM@gmail.COM

COMPANY:

ADDRESS: 2505 JANE ADDAMS DR
SCHERTZ TX 78154-1164

PHONE: 4104046511

FAX:

COMMENTS: Development in the area is nearing the point it will kill the golden goose. I grew up swimming the Comal and Guadalupe through New Braunfels and am saddened by the direction and level at which officials are permitting these resources to be endangered (through this and the odious approval decisions on the 3009 Vulcan Quarry).

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 1:45 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: derekmorehead@yahoo.com <derekmorehead@yahoo.com>
Sent: Tuesday, February 28, 2023 8:55 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Derek Morehead

EMAIL: derekmorehead@yahoo.com

COMPANY:

ADDRESS: 10015 CREEKWOOD PASS
SPRING BRANCH TX 78070-7027

PHONE: 8308853929

FAX:

COMMENTS: As a member of this surrounding community being directly affected by this permit, I request that this permit be DENIED! This permit will contribute to negative impacts on groundwater quality, area streams and rivers, caves and caverns, area wells, the Edwards and Trinity Aquifers, and ground wells of area residents. THere is no plan for beneficial reuse or land application. Please deny this permit. I am requesting a public meeting to discuss these impacts of this permit.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 1:45 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: jmolivier@sbcglobal.net <jmolivier@sbcglobal.net>
Sent: Tuesday, February 28, 2023 8:54 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Jack Olivier

EMAIL: jmolivier@sbcglobal.net

COMPANY:

ADDRESS: 1509 CABERNET
NEW BRAUNFELS TX 78132-2768

PHONE: 8308855476

FAX:

COMMENTS: I request a Public Meeting for this proposed permit. The discharge point of up to 600,000 gallons per day of treated wastewater directly into the West Fork is too close to the Edwards Aquifer Recharge Zone. The number of caves present in the immediate area is an indication of how quickly surface contamination will be able to enter the aquifer with little-to-no additional natural cleaning or filtration. A Public Meeting is needed to discuss potential

alternatives, such as a reduction in total volume, a decrease in lot density, and the addition of beneficial water reuse and/or land application (TLAP).

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Mark and Susan Peteete

Mailing Address: 2631 Bretzke Ln

Physical Address (if different): _____

City/State: New Braunfels TX **Zip:** 78132

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: peteete@att.net

Phone Number: (830) 708 4726

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Who tests the water in the Comal river? At what spots is it tested? How often is it tested? Where can the results be found? Who reviews the test results? At ~~what~~ some point ~~does~~ who makes the decision ~~that~~ when there is too much bacteria?

Susan Peteete

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:38 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: dellisphelps@gmail.com <dellisphelps@gmail.com>
Sent: Saturday, February 25, 2023 1:49 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Debra C Phelps

EMAIL: dellisphelps@gmail.com

COMPANY:

ADDRESS: 5451 MEADOW LARK DR
BULVERDE TX 78163-2317

PHONE: 8305159204

FAX:

COMMENTS: I request a public meeting prior to the issue of this permit which, if given, has potential negative effects on area groundwater, we'll, rivers, caves, structures, citizen health, and much more.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, June 7, 2023 4:34 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: poffsrus@gmail.com <poffsrus@gmail.com>
Sent: Wednesday, June 7, 2023 4:12 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: MR Mike Poffenberger

EMAIL: poffsrus@gmail.com

COMPANY:

ADDRESS: 1940 PINOTAGE
NEW BRAUNFELS TX 78132-1857

PHONE: 7134923935

FAX:

COMMENTS: This permit should be declined for the following reasons: - EARZ is a very environmentally sensitive area due to numerous karst features (caves, sinkholes, dissolved fractures, etc.) in the limestone which allows for water to drain into the recharge zone without being filtered. There are known caves and sinkholes directly adjacent to the property. As such, the waste water will negatively impact the quality of the water in aquifer. - Waste water plant is within 2000' of the EARZ so it is unlikely that discharge will be filtered or diluted before entering the EARZ and therefore will likely degrade the quality of the water entering the EARZ. This is supported by scientific modeling in a recent study by the Southwest Research Institute Study commissioned by the City of San Antonio Parks and Recreation Department,

the Edwards Aquifer Protection Program, and the San Antonio River Authority in Bexar County on Helotes Creek (October 2020). - Any flooding that might take place in the vicinity of the waste water treatment plant (it is near the 100 year floodplain) has the potential to flush untreated discharge into the drainage area. This area is prone to flash flooding so this is certainly a possibility. - Waste water plant is oversized for the size of the development. A nearby subdivision, Meyer Ranch, had a similar number of homes proposed so the originally waste water treatment plant only had a capacity of 390,000 gallons which is much less that the 600,000 gallons proposed for Harrison Ranch. - Precedent was set in Meyer Ranch (also a high density on the EARZ) where they changed the permit from the TPDES to 100% beneficial reuse after litigation in 2016. It include provisions for 100% beneficial reuse and groundwater monitoring for runoff As such, it should be requested to convert to a land application permit (The Grove, Vintage Oaks) or 100% beneficial reuse as indicated above for Meyer Ranch and NOT a TPDES as requested for Harrison Ranch. - The Edwards Aquifer provides drinking water for 2 million people that live in and around San Antonio. The Dry Comal Creek and Comal River are essential natural resources in Comal and Guadalupe Counties, supporting economic development, recreational activities, and agricultural operations in the area. The Dry Comal Creek was listed as having impaired water quality issues dating back to 2010, and the proposed permit application only adds to the challenges facing these invaluable and irreplaceable resources. As such this permit should be declined.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:47 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: poffsrus@gmail.com <poffsrus@gmail.com>
Sent: Saturday, February 25, 2023 8:15 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Mike Poffenberger

EMAIL: poffsrus@gmail.com

COMPANY:

ADDRESS: 1940 PINOTAGE
NEW BRAUNFELS TX 78132-1857

PHONE: 7134923935

FAX:

COMMENTS: This permit should be denied. The Edwards aquifer recharge zone is one of the most sensitive areas in this part of the Hill Country. Treated waste water dumped into the nearby creeks will get into the water supply as this is directly over the recharge zone. Regardless of treated water, you will still have contamination in the aquifer (nitrogen and phosphorus). In addition, high density housing over the recharge zone limits surface area for rainwater to get into the aquifer. Obvious spills of auto fluids as well as fertilizers and other chemicals applied on lawns from a high density

neighborhood will add to the problems of wastewater contamination. 600,000 gals of treated waste water equates to an Olympic sized swimming pool being discharged daily. This should not be deemed acceptable. Area wells will certainly be affected. I urge you to reject this permit.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:04 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: swrandolph@gmail.com <swrandolph@gmail.com>
Sent: Sunday, February 26, 2023 2:42 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Susan W Randolph

EMAIL: swrandolph@gmail.com

COMPANY:

ADDRESS: 1463 REDCLOUD PEAK
CANYON LAKE TX 78133-5994

PHONE: 7144692195

FAX:

COMMENTS: I am writing to ask you to conduct a public meeting regarding the proposed daily dumping of up to 600,000 gallons of treated sewage into the West Fork Dry Comal Creek and Dry Comal Creek, which flow into the Comal River in New Braunfels. My specific questions I would like addressed by TCEQ are: Since the effluent will flow into and over the Edwards Aquifer Recharge Zone, what additional protections will be implemented? Relative to other discharge permits in the Hill Country, 600,000 gallons per day represents a very high volume of effluent. Why such a high volume on this

permit application? Considering the proximity to EARZ and ultimate flow into the Comal River, what alternatives such as land use application or enhanced treatment/reduced volume have been considered? Both the Dry Comal Creek and Comal River are essential natural resources in this geographic area, supporting economic development and recreation in New Braunfels, as well as agriculture operations throughout the area. These two bodies of water need protection and preservation and should not be subject to activities that would further degrade the water quality and increase the quantity of low-quality water in this watershed region. I respectfully urge you to hold a Public Meeting regarding this permit application. This will allow the public to benefit from a fuller discussion of the facts surrounding this environmentally sensitive project.

~~13~~ 14

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Pam Reitz

Mailing Address: 605 Springs Nursery

Physical Address (if different): _____

City/State: New Braunfels TX **Zip:** 78130

****This information is subject to public disclosure under the Texas Public Information Act*****

Email: pamela reit pamelareit2@gmail.com

Phone Number: (713) 252-5296

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☑ No

  If yes, which one? _____

☑ **Please add me to the mailing list.**

☑ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, June 7, 2023 2:14 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: pamelareitz@gmail.com <pamelareitz@gmail.com>
Sent: Wednesday, June 7, 2023 11:05 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Pamela Reitz

EMAIL: pamelareitz@gmail.com

COMPANY:

ADDRESS: 605 SPRINGS NURSERY
NEW BRAUNFELS TX 78130-5537

PHONE: 7132525896

FAX:

COMMENTS: PLEASE...do not even consider this application. It could be an environmental disaster. I live in Town Creek which is built along the Dry Comal Creek and the idea scares me. I also enjoy being in the Comal River and can't imagine what could happen to our beautiful rivers if there was an "accident". There have been too many problems with our nation's rivers...don't let it happen to our rivers. We do not need another huge development in our sensitive area. Please...stand up for us! Thank you for your consideration, Pam Reitz

Jennifer Cox

From:	PUBCOMMENT-OCC
Sent:	Tuesday, October 8, 2024 1:10 PM
To:	PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject:	FW: Public comment on Permit Number WQ0016211001

From: djkarichardson@yahoo.com <djkarichardson@yahoo.com>
Sent: Saturday, October 5, 2024 8:33 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: David Richardson

EMAIL: djkarichardson@yahoo.com

COMPANY:

ADDRESS: 1211 CHABLIS
NEW BRAUNFELS TX 78132-2767

PHONE: 8308329566

FAX:

COMMENTS: Wastewater discharge rate is 600,000 gpd, which is 2 times higher than necessary. Harrison has filed for Beneficial Reuse of treated wastewater, but the percentage is not specified. At Meyer Ranch, the TPDES was negotiated to 100% Beneficial Reuse and 2 water-quality monitoring wells. This 100% Beneficial Reuse should be included for Harrison Ranch, plus monitoring wells, a lower density subdivision platting, and a reduction in total discharge rate. The article in the SA Express News

clearly indicates the impacts to all local rivers and environment. Destroying the Hill Country assets. You can not let this happen on your watch.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:06 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: kimberlysdiamond@gmail.com <kimberlysdiamond@gmail.com>
Sent: Sunday, February 26, 2023 9:21 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Kim Russell

EMAIL: kimberlysdiamond@gmail.com

COMPANY:

ADDRESS: 1621 ANGOLO
NEW BRAUNFELS TX 78132-2782

PHONE: 7607161432

FAX:

COMMENTS: This will negatively impact my water, my well water. I oppose this action of treated sewage water being dicharged into our water sources

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, June 8, 2023 8:28 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: cdsarubbi@gmail.com <cdsarubbi@gmail.com>
Sent: Wednesday, June 7, 2023 5:36 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Craig Sarubbi

EMAIL: cdsarubbi@gmail.com

COMPANY:

ADDRESS: 7806 RIVER RD
NEW BRAUNFELS TX 78132-3112

PHONE: 2819484579

FAX:

COMMENTS: As an affected land owner with 2 properties in Comal County, I wish to state my disapproval of the Harrison Tract Wastewater Treatment Facility Application. Much lower development density should be required as well as a "no-discharge" Texas Land Application Permit (TLAP). It is far past time that TCEQ stop allowing the overuse of water in Comal County and start requiring no discharge for new mass developments.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:08 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: cdsarubbi@gmail.com <cdsarubbi@gmail.com>
Sent: Monday, February 27, 2023 2:24 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Craig Sarubbi

EMAIL: cdsarubbi@gmail.com

COMPANY:

ADDRESS: 7806 RIVER RD
NEW BRAUNFELS TX 78132-3112

PHONE: 2819484579

FAX:

COMMENTS: Requesting a public meeting to contest the proposed wastewater permit. Permit should be denied. I am on a water well in the area and on the waterfront and will be negatively impacted. Aquifer quality, river quality, water levels are over used, and property values will be impacted. County needs to STOP uncontrolled development. Enough is enough. Stop DEPLETING and RUINING the resources. Have some foresight and restraint! Do not allow the environment

to be overused and permanently ruined on YOUR WATCH. Save the environment of Comal County and the Edwards and Trinity Aquifers.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, March 1, 2023 2:04 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: c_a_segovia@yahoo.com <c_a_segovia@yahoo.com>
Sent: Tuesday, February 28, 2023 3:51 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Maria Carmen Segovia

EMAIL: c_a_segovia@yahoo.com

COMPANY:

ADDRESS: 546 ORCHARD WAY
NEW BRAUNFELS TX 78132-2976

PHONE: 6502691547

FAX:

COMMENTS: Request a public meeting. Potential negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). Potential negative impact on area streams and rivers (Dry Comal Creek, Comal River, Guadalupe River). No plan for beneficial reuse or land application (TLAP). Potential negative impact on area caves and caverns.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Thursday, June 8, 2023 12:17 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: rsjustagirl@gmail.com <rsjustagirl@gmail.com>
Sent: Thursday, June 8, 2023 10:25 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: ROBIN SHERMAN

EMAIL: rsjustagirl@gmail.com

COMPANY:

ADDRESS: 1069 PROVENCE PL
NEW BRAUNFELS TX 78132-2769

PHONE: 8505168185

FAX:

COMMENTS: I am writing to contest the permit application WQ0016211001 which seeks to discharge 600,000 gallons of sewage effluent into the Comal river. This permit should be denied on numerous grounds. When my home was built I was required to have an aerobic septic installed - with quarterly mandated inspections - in order to protect the Edwards Aquifer. Why isn't this developer having to meet the same requirements? Why can this development be allowed to discharge effluent into our river, negatively impacting our groundwater, our streams, rivers, caves and caverns? Has this application received adequate review? I am against this permit's approval for the reasons stated above.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 2:20 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: rshermantx@gmail.com <rshermantx@gmail.com>
Sent: Monday, February 27, 2023 3:29 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Robin Sherman

EMAIL: rshermantx@gmail.com

COMPANY:

ADDRESS: 1069 PROVENCE PL
NEW BRAUNFELS TX 78132-2769

PHONE: 8505168185

FAX:

COMMENTS: My family requests a public meeting be held on this permit application. We are affected by this permit as this discharge of over 600,000 GPD of wastewater into the West Fork of the Dry Comal Creek and the Dry Comal Creek will compromise our already threatened water supply from the Edward Aquifer and the Trinity Aquifer. Our area's economy and our livelihood depend on tourism for our area streams and ricers. There is NO plan for beneficial reuse or land application, no thought of the danger to our tourism attractions like the caves and caverns. If the bats living in the

caves are endangered the tons of insects they eat every night will flourish. Approving this permit - especially without hearing from the stakeholders is a reckless and dangerous dereliction of duty.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 11:35 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: snsimpson@toast.net <snsimpson@toast.net>
Sent: Saturday, February 25, 2023 12:03 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Nancy Simpson

EMAIL: snsimpson@toast.net

COMPANY:

ADDRESS: PO BOX 416
BULVERDE TX 78163-0416

PHONE: 2103153753

FAX:

COMMENTS: We need to protect the Edward's Aquifer as well as well water for people living in the area. If this is safe, please have a public meeting to explain to the parties in the area how this will not affect our water supply. That is the least you can do especially after what the people are going through in Ohio right now. Thank you.

Did not speak

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Tody Sindelar

Mailing Address: 105 E Edgewater Ter

Physical Address (if different): _____

City/State: NB TX **Zip:** 78130

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: Todyville@gmail.com

Phone Number: (830) 708-8009

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☒ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Please give this form to the person at the information table. Thank you.

From: Tody Sindealr todyville@gmail.com
Subject:
Date: June 8, 2023 at 5:24 PM
To:

Submitted by
Tody Sindelar
6/8/2023

My name is Tody Sindelar
105 E Edgewater Ter,
New Braunfels, 78130
I live on the Comal River.

I have one question for the board, but primarily for Mr Harrison.

Would you allow your children and your grandchildren to swim in a pool which was filled with GRAY WATER????

That is what you are proposing to do to the people of New Braunfels and the tourists on which our economy relies.

It will be a DOMINO EFFECT. First your subdivision, then each ranch between here and New Braunfels will be dumping their GRAY WATER into the Dry Comal, so that it can make its way to the Comal.

Tody Sindelar
105 E Edgewater Tor
NB, TX 78130

DOES ~~Do~~ it have any effect on the decision to permit that this many people showed up OPPOSED to the permit?

RECEIVED
JUN 05 2023
AT PUBLIC MEETING

(7)

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: John Spence

Mailing Address: 114 E. Lincoln

Physical Address (if different): _____

City/State: New Braunfels **Zip:** 78310

*****This information is subject to public disclosure under the Texas Public Information Act*****

Email: Jspence49@Gmail.Com

Phone Number: (512) 565-0064

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☒ No

  If yes, which one? _____

☒ **Please add me to the mailing list.**

☒ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

☐ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**

(Written comments may be submitted at any time during the meeting)

Against Discharge.

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

Please give this form to the person at the information table. Thank you.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Friday, March 3, 2023 9:12 AM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: bonadventure@hotmail.com <bonadventure@hotmail.com>
Sent: Thursday, March 2, 2023 4:38 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Bonnie Jean Stewart

EMAIL: bonadventure@hotmail.com

COMPANY:

ADDRESS: 6106 CRESCENT FLS
WINDCREST TX 78239-2638

PHONE: 2103670757

FAX:

COMMENTS: I request a public meeting to discuss the permit allowing 600,000 gallons of treated sewage to flow into the West Fork Dry Comal Creek and Dry Comal Creek. This is of utmost importance and requires a public meeting to throughly discuss this issue.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:04 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: mcsi29@yahoo.com <mcsi29@yahoo.com>
Sent: Sunday, February 26, 2023 2:52 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: MS Michele C Sobeck

EMAIL: mcsi29@yahoo.com

COMPANY:

ADDRESS: 525 VILLAGE VIEW DR
CANYON LAKE TX 78133-5524

PHONE: 7138905156

FAX:

COMMENTS: This water dump is unacceptable. When will TCEQ respect the needs of the community over capital gains?

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, March 6, 2023 10:35 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: looksbytara@yahoo.com <looksbytara@yahoo.com>
Sent: Sunday, March 5, 2023 8:47 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: TARA Songey

EMAIL: looksbytara@yahoo.com

COMPANY:

ADDRESS: 421 CHINKAPIN TRL
NEW BRAUNFELS TX 78132-2979

PHONE: 5126658427

FAX:

COMMENTS: Permit application should be denied. Potential negative impact on groundwater quality (i.e., area water wells, Edwards Aquifer, Trinity Aquifer). Potential negative impact on area streams and rivers (Dry Comal Creek, Comal River, Guadalupe River).

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 2:21 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: vickieasutton@yahoo.com <vickieasutton@yahoo.com>
Sent: Monday, February 27, 2023 3:13 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Vickie Sutton

EMAIL: vickieasutton@yahoo.com

COMPANY:

ADDRESS: 715 SUNRISE TRL
SPRING BRANCH TX 78070-5605

PHONE: 5126948151

FAX:

COMMENTS: Requesting a public meeting

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:07 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: vickieasutton@yahoo.com <vickieasutton@yahoo.com>
Sent: Sunday, February 26, 2023 11:40 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Vickie Sutton

EMAIL: vickieasutton@yahoo.com

COMPANY:

ADDRESS: 715 SUNRISE TRL
SPRING BRANCH TX 78070-5605

PHONE: 5126948151

FAX:

COMMENTS: Requesting a public meeting

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:08 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: matthewjthibeault@gmail.com <matthewjthibeault@gmail.com>
Sent: Monday, February 27, 2023 5:54 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Matthew Thibeault

EMAIL: matthewjthibeault@gmail.com

COMPANY:

ADDRESS: 2085 HOLLAND SPGS
CANYON LAKE TX 78133-6064

PHONE: 8303885063

FAX:

COMMENTS: This permit should be denied. I live in the area effected.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 1:48 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: lcthompson54@gmail.com <lcthompson54@gmail.com>
Sent: Tuesday, February 28, 2023 8:31 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: MR Carl Thompson

EMAIL: lcthompson54@gmail.com

COMPANY:

ADDRESS: 1026 STRADINA
NEW BRAUNFELS TX 78132-2778

PHONE: 7138994247

FAX:

COMMENTS: Please schedule a public meeting on this wastewater discharge application. Issues to be addressed are: Since the effluent will be flowing into and over the Edwards Aquifer Recharge Zone, what additional protections will be implemented? Relative to other discharge permits in the Hill Country, 600,000 gallons per day represents a very high volume of effluent. Why such a high volume on this permit application? Considering the proximity to EARZ and ultimate

flow into the Comal River, what alternatives (such as land use application or enhanced treatment/reduced volume) have been considered? A public meeting is needed.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, June 7, 2023 4:45 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001
Attachments: Comments to TCEQ on Doug Harrison wastewater permit application.pdf

From: waterguy@ix.netcom.com <waterguy@ix.netcom.com>
Sent: Wednesday, June 7, 2023 4:39 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: David Venhuizen

EMAIL: waterguy@ix.netcom.com

COMPANY: David Venhuizen, P.E.

ADDRESS: 5803 GATESHEAD DR
AUSTIN TX 78745-3526

PHONE: 5124424047

FAX:

COMMENTS: Please see the attached document.

Comments to the Texas Commission on Environmental Quality
Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0016211001

TCEQ bureaucrats are never shy about telling us how many applications they are juggling, how stretched their resources are. Here we have a permit application that TCEQ can, and should, summarily dismiss with a single word, "No." No need to further tax the state's limited resources.

Before we even get to the Clean Water Act, the major technical reason this application should be summarily rejected as being non-compliant, we have the matter of the state's resources being hijacked to put in place an "entitlement", for which there is no purpose, other than the applicant's desire to increase the speculative value of his land. TCEQ should consider if raw land speculation, absent any actual intent to install the wastewater system for which a permit is sought, merits encumbering the state's limited resources to consider and adjudicate. Rather, those resources should perhaps be reserved for consideration of actual applications for wastewater systems that would actually serve actual developments. It should be called to question if an applicant who has no intention of building a development on the land in question should have standing to apply for a wastewater system permit to serve an imagined development, solely for the purpose of land speculation.

The genesis of the land plan set forth in the application is opaque, and so far no development approvals have been sought from Comal County, where this project is located. One version of the land plan that has been circulated shows over 100 lots lying in the flood plain, so it appears this project could not be platted as shown. The development plan is a "straw man" project, not an actual basis for setting forth a wastewater system plan to provide wastewater service over this land area.

The applicant is requesting an NPDES permit to discharge up to 600,000 gallons/day into an ephemeral creek, the West Fork of Dry Comal Creek, thence to Dry Comal Creek, then on into the Comal River, then into the Guadalupe River. Without regard to any water quality issues in these water bodies, the propriety of requesting a discharge permit at this point is called to question.

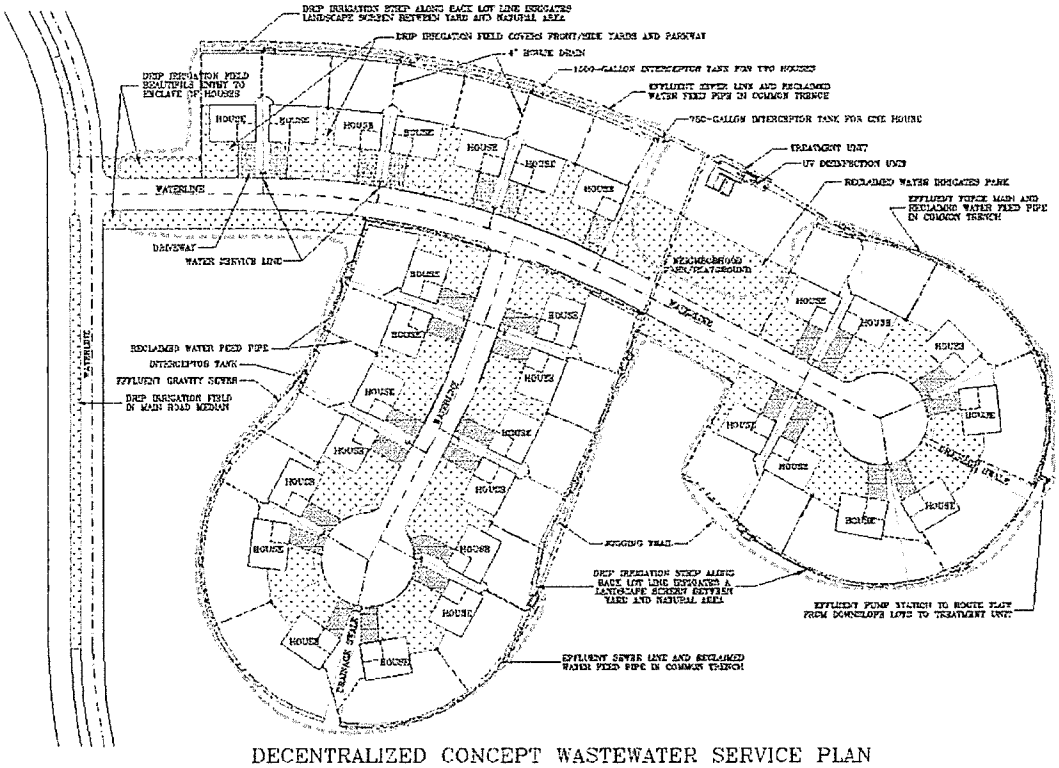
The Clean Water Act (CWA) requires that all "reasonable" options to discharge be considered prior to approving a permit to discharge. In the TCEQ document RG-194, "Procedures to Implement the Texas Surface Water Quality Standards" that requirement is explicitly stated: "An analysis of alternatives to the proposed discharge that could eliminate or reduce the anticipated degradation, and an assessment of cost and feasibility for reasonable alternatives." To date it does not appear that TCEQ has required consideration of ***any*** options to the requested discharge permit. Thus, it would seem that TCEQ may not consider a discharge permit here at all, because NO options, no matter what evaluations of "reasonableness" anyone may assert about them, have been set forth, a violation of the CWA.

Regarding the sorts of "reasonable" options that the applicant could consider, as has been reviewed for TCEQ on multiple occasions, it is suggested that there is a strategy to avoid discharge that could readily be employed, a strategy that is generally described below. A strategy that would deliver high quality water management in a manner that is ***more fiscally reasonable, more societally responsible, and more environmentally benign*** than the course set forth by this applicant.

The "decentralized concept" is the generic name for this strategy, which basically holds that "waste" water is most effectively and efficiently managed, ***as a water resource***, by treating it – and reusing it to the maximum extent practical – as close to where it is generated as practical. The degree of collectivization at any given treatment center is based on judgment of what is indeed most practical, taking into account the nature of the development being served, the topography, the site and soil conditions, etc., but typically it would be at a "neighborhood" level. By distributing the overall wastewater system in this manner, much of the cost of the collection system is obviated, largely

blunting if not eliminating the facilities that compose a large majority of the total cost of the conventional centralized system, the large trunk mains and lift stations. And by making the treated effluent available on a highly distributed basis, much of the cost of the system to redistribute this water resource to points of reuse are similarly avoided. In short, resources are focused on the job that society really needs to have accomplished, beneficial reuse of this water resource, rather than dedicating a large majority of the money to just moving water from place to place.

At https://waterblogue.com/2014/09/24/this-is-how-we-do-it/ (deemed to be part and parcel of this comment) is a general overview of the decentralized concept strategy, as it might be applied to a neighborhood in what appears to be a fairly typical Hill Country subdivision, the very sort of development that this applicant's "straw man" development plan sets forth. A schematic of the system described in that piece is shown below. This decentralized concept strategy would feature effluent sewerage collection systems, distributed "fail-safe" treatment plants – which are not noisy and odiferous and so could be deployed at a neighborhood scale – and dispersal of the treated effluent in subsurface drip irrigation fields, arrayed to the maximum extent practical over areas that would be irrigated as a matter of course, whether the effluent were available to supply that irrigation or not.



DECENTRALIZED CONCEPT WASTEWATER SERVICE PLAN

This strategy, being what might be termed a "modified TLAP", would put in place the "disposal" field and the reuse system in one fell swoop. Those drip irrigation fields – formally they may be called TLAP fields – can be loaded 24/7/365, providing beneficial irrigation through the large majority of the year in this climate when irrigation is beneficial, and very responsibly "disposing" of the effluent into a robust soil system during the small part of the year when the "irrigation" would be a "disposal process". Thus, the resource value of this water would be practically, cost efficiently maximized, right there in the neighborhood where that "waste" water was generated. Quite a "reasonable" proposition.

While the details of how a decentralized concept strategy may be executed in the particular circumstances of the land in question here must be deferred to a bona fide planning process addressing

this land, https://waterblogue.com/2016/09/26/lets-compare/ (deemed to be part and parcel of this comment) offers a review of the ways in which the decentralized concept strategy would be ***more fiscally reasonable, more societally responsible, and more environmentally benign*** than the conventional centralized strategy would be in providing wastewater service to new development in the urban hinterlands, such as is proposed by this applicant. As reviewed there, a decentralized concept system can be expected to have a far lower global life-cycle cost than would a conventional centralized system, perhaps one-half, or *less*. Again, since the water would be routed to beneficial reuse just as a result of the way the system is designed and run, it would practically maximize the beneficial utilization of this water resource.

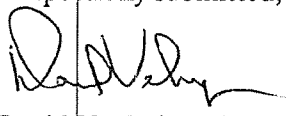
It is understood that there are a number of institutional challenges to implementing the decentralized concept strategy, not the least being that it runs counter to the manner which TCEQ has set forth it expects to see wastewater management executed. Organized and run to essentially "dispose" of a perceived nuisance. Indeed, in this case, the applicant has asserted that a "210" application, to reuse rather than to discharge the water resource to a stream, is being applied for parallel with the NPDES permit. It should be rather obvious that this process too is a "straw man", as no uses or procedures to apply that water resource to serving water uses that would otherwise be supplied by the "original" water supply can be seen. Thus, that is not a "reasonable" option to discharge, and won't be until an actual plan in an actual context is detailed.

TCEQ is blunting any consideration of the decentralized concept strategy, or of any other options to an NPDES permit to discharge this water resource to a stream by not enforcing the CWA provision that all "reasonable" options to discharge – or more strictly correctly, the degradation of water quality a discharge may impart – prior to issuing the NPDES permit. TCEQ appears to be failing in this regard because it expects applicants to adhere to its world view that the "waste" water management process is all about "disposal" of a perceived nuisance, which it expects to be executed under a "regionalization" policy, gathering wastewater from hither and yon to one centralized treatment plant, the more centralized the better, concentrating the problem as much as "practical". It is only when the treated effluent issues from that treatment plant does TCEQ grant that this perceived nuisance is actually indeed a resource, that can be put to work in service of society, using it to defray demands on "original" water supplies, and so saving water for society.

And thus it is that this applicant, and those who are advising him, are proceeding in the manner they perceive TCEQ expects them to. As noted, they are doing so not with the expectation that this applicant would build the development that would generate the asserted flow and would build the wastewater system that would be permitted under this process. Rather, they are doing so solely for the purpose of creating the "entitlement" a wastewater permit is perceived to impart, solely for the purpose of increasing the speculative price of this land.

Please consider if, first, TCEQ should be a willing participant in land speculation schemes at all, and second, that TCEQ should not be considering a permit to discharge into a stream unless and until the applicant has set forth "reasonable" options to discharge as the fate of this water resource, to avoid the water quality degradation that process would impart. This applicant has not made any effort whatsoever to consider ANY options, without regard to anyone's evaluation of how "reasonable" they might be. Thus, unless/until it receives a bona fide review of such options. TCEQ should simply say "No."

Respectfully submitted,



David Venhuizen, P.E.

Ellie Guerra

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Sent: Wednesday, June 7, 2023 4:45 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
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Attachments: Comments to TCEQ on Doug Harrison wastewater permit application.pdf

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REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: David Venhuizen

EMAIL: waterguy@ix.netcom.com

COMPANY: David Venhuizen, P.E.

ADDRESS: 5803 GATESHEAD DR
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PHONE: 5124424047

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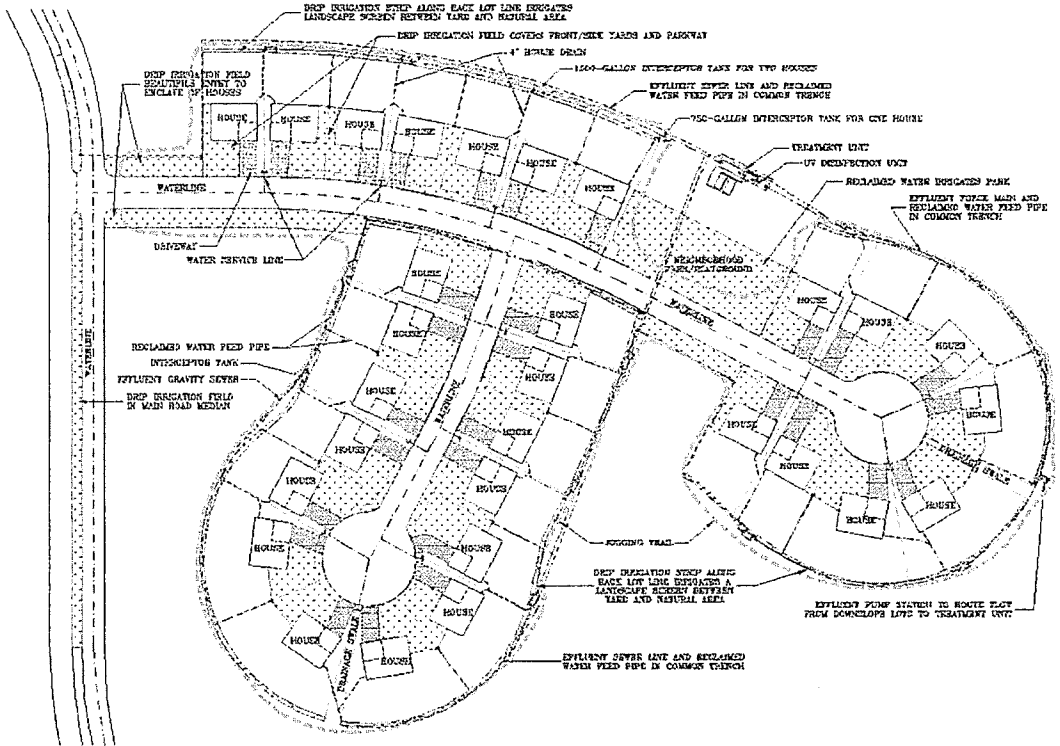

DECENTRALIZED CONCEPT WASTEWATER SERVICE PLAN

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this land, https://waterblogue.com/2016/09/26/lets-compare/ (deemed to be part and parcel of this comment) offers a review of the ways in which the decentralized concept strategy would be ***more fiscally reasonable, more societally responsible, and more environmentally benign*** than the conventional centralized strategy would be in providing wastewater service to new development in the urban hinterlands, such as is proposed by this applicant. As reviewed there, a decentralized concept system can be expected to have a far lower global life-cycle cost than would a conventional centralized system, perhaps one-half, or ***less***. Again, since the water would be routed to beneficial reuse just as a result of the way the system is designed and run, it would practically maximize the beneficial utilization of this water resource.

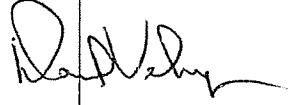
It is understood that there are a number of institutional challenges to implementing the decentralized concept strategy, not the least being that it runs counter to the manner which TCEQ has set forth it expects to see wastewater management executed. Organized and run to essentially "dispose" of a perceived nuisance. Indeed, in this case, the applicant has asserted that a "210" application, to reuse rather than to discharge the water resource to a stream, is being applied for parallel with the NPDES permit. It should be rather obvious that this process too is a "straw man", as no uses or procedures to apply that water resource to serving water uses that would otherwise be supplied by the "original" water supply can be seen. Thus, that is not a "reasonable" option to discharge, and won't be until an actual plan in an actual context is detailed.

TCEQ is blunting any consideration of the decentralized concept strategy, or of any other options to an NPDES permit to discharge this water resource to a stream by not enforcing the CWA provision that all "reasonable" options to discharge – or more strictly correctly, the degradation of water quality a discharge may impart – prior to issuing the NPDES permit. TCEQ appears to be failing in this regard because it expects applicants to adhere to its world view that the "waste" water management process is all about "disposal" of a perceived nuisance, which it expects to be executed under a "regionalization" policy, gathering wastewater from hither and yon to one centralized treatment plant, the more centralized the better, concentrating the problem as much as "practical". It is only when the treated effluent issues from that treatment plant does TCEQ grant that this perceived nuisance is actually indeed a resource, that can be put to work in service of society, using it to defray demands on "original" water supplies, and so saving water for society.

And thus it is that this applicant, and those who are advising him, are proceeding in the manner they perceive TCEQ expects them to. As noted, they are doing so not with the expectation that this applicant would build the development that would generate the asserted flow and would build the wastewater system that would be permitted under this process. Rather, they are doing so solely for the purpose of creating the "entitlement" a wastewater permit is perceived to impart, solely for the purpose of increasing the speculative price of this land.

Please consider if, first, TCEQ should be a willing participant in land speculation schemes at all, and second, that TCEQ should not be considering a permit to discharge into a stream unless and until the applicant has set forth "reasonable" options to discharge as the fate of this water resource, to avoid the water quality degradation that process would impart. This applicant has not made any effort whatsoever to consider ANY options, without regard to anyone's evaluation of how "reasonable" they might be. Thus, unless/until it receives a bona fide review of such options. TCEQ should simply say "No."

Respectfully submitted,



David Venhuizen, P.E.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, February 28, 2023 1:49 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: lornacvilla@gmail.com <lornacvilla@gmail.com>
Sent: Tuesday, February 28, 2023 7:24 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Lorna Villarreal

EMAIL: lornacvilla@gmail.com

COMPANY:

ADDRESS: 1235 YAUPON LOOP
NEW BRAUNFELS TX 78132-2963

PHONE: 7133529703

FAX:

COMMENTS: respectfully ask that you request a public meeting from TCEQ on wastewater discharge Some of my unanswered questions include: Since the effluent will be flowing into and over the Edwards Aquifer Recharge Zone, what additional protections will be implemented? Relative to other discharge permits in the Hill Country, 600,000 gallons per day represents a very high volume of effluent. Why such a high volume on this permit application? Considering the proximity to EARZ and ultimate flow into the Comal River, what alternatives such as land use application

or enhanced treatment/ reduced volume) have been considered? A public meeting would give the developer and TCEQ an opportunity to present useful information to the public about their proposed plans.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Monday, February 27, 2023 12:09 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

PM

From: alexandreginaviola@gmail.com <alexandreginaviola@gmail.com>
Sent: Monday, February 27, 2023 8:32 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Regina Viola

EMAIL: alexandreginaviola@gmail.com

COMPANY:

ADDRESS: 412 CAVY RD
NEW BRAUNFELS TX 78132-3446

PHONE: 7022787982

FAX:

COMMENTS: Request a public meeting.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Wednesday, March 1, 2023 2:13 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

From: tina.warren@gvtc.com <tina.warren@gvtc.com>
Sent: Wednesday, March 1, 2023 8:03 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

FROM

NAME: Tina Warren

EMAIL: tina.warren@gvtc.com

COMPANY:

ADDRESS: 1237 VIA PRINCIPALE
NEW BRAUNFELS TX 78132-2604

PHONE: 8307776400

FAX:

COMMENTS: 1. Since the effluent will be flowing into and over the Edwards Aquifer Recharge Zone (EARZ), what additional protections will be implemented? 2. Relative to other discharge permits in the Hill Country, 600,000 gallons per day represents a very high volume of effluent. Why such a high volume on this permit application? 3. Considering the proximity to EARZ and ultimate flow into the Comal River, what alternatives (such as land use application or enhanced treatment/reduced volume) have been considered? 4. What long-term environmental impacts are expected?

There are several new housing developments going on on Hwy 46, the quarry at Hwy 46/FM3009, and existing developments along the corridor. What environmental impact analysis (along with studies for water source sustainability) has been done?

TCEQ Registration Form

June 8, 2023

Douglas T. Harrison
TPDES PERMIT FOR MUNICIPAL WASTEWATER
PERMIT NO. WQ0016211001

PLEASE PRINT

Name: Julie & Bert Whitaker

Mailing Address: 880 Wiesner Rd, Spring Branch

Physical Address (if different): _____

City/State: Spring Branch, TX **Zip:** 78070

****This information is subject to public disclosure under the Texas Public Information Act*****

Email: rockinw@gvtc.com

Phone Number: ( )

- Are you here today representing a municipality, legislator, agency, or group? ☐ Yes ☐ No

  If yes, which one? _____

RECEIVED
JUN 08 2023
AT PUBLIC MEETING

☒ **Please add me to the mailing list.**

☐ **I wish to provide formal *ORAL COMMENTS* at tonight's public meeting.**

→ They said there is no MUD/PUD but refer to the treatment plant

☒ **I wish to provide formal *WRITTEN COMMENTS* at tonight's public meeting.**
(Written comments may be submitted at any time during the meeting)

The Comal River is one of the few pristine waterways in Texas
How much waste can we continue to dump? refuse from the continuing subdivision growth.
Secondly - water is a growing concern for Comal and surrounding areas.

Please give this form to the person at the information table. Thank you.

Allowing build on/in flood zones put people in jeopardy but also increase contamination of our waterways / flood drainage areas.

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Tuesday, June 6, 2023 10:10 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: Courtneyjwillcox@gmail.com <Courtneyjwillcox@gmail.com>
Sent: Tuesday, June 6, 2023 8:12 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Courtney Willcox

EMAIL: Courtneyjwillcox@gmail.com

COMPANY:

ADDRESS: 5010 S CONGRESS AVE 1408
AUSTIN TX 78745-2203

PHONE: 5126188316

FAX:

COMMENTS: I am extremely against this development. It is unsustainable and it is ruining the great hill country and the beauty that draws people in. Stop destroying the uniqueness of Texas to appease people moving in. It is extremely disheartening that the root of all this destruction is to make a buck. Have some morality and ethics, please!

Ellie Guerra

From: PUBCOMMENT-OCC
Sent: Friday, June 9, 2023 8:59 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001

From: shane@rockinr.com <shane@rockinr.com>
Sent: Thursday, June 8, 2023 6:12 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Shane Wolf

EMAIL: shane@rockinr.com

COMPANY: Hospitality & Visitors Assn

ADDRESS: 1405 GRUENE RD
NEW BRAUNFELS TX 78130-3334

PHONE: 2146167366

FAX:

COMMENTS: On behalf of the board and members of The Hospitality and Visitors Association of Comal County (HAVA) we can not support the current case number without further details on how the proposed discharge will affect our environment, neighbors and visitors. We strive as an organization in pursuing, protecting and building excellence for our businesses, our community and our visitors. We are a supporter of the City of New Braunfels Watershed Protection Plan which has been funded partly by TCEQ and US EPA. We feel more clarification is needed before proceeding.

Thomas Lee

From: PUBCOMMENT-OCC
Sent: Wednesday, July 5, 2023 12:42 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Resolution No. 2023-06-20 CCWRD1
Attachments: Resolution No. 2023-06-20 CCWRD1

Associate to WQ0016211001

From: Info <Info@tceq.texas.gov>
Sent: Wednesday, July 5, 2023 8:32 AM
To: CHIEFCLK <chiefclk@tceq.texas.gov>
Subject: FW: Resolution No. 2023-06-20 CCWRD1

The attached email was received in the External Relations Division "info" email box. If you can assist the customer, please copy info@tceq.texas.gov with your response.

Thank you,

Lisa Robinson
Pollution Prevention and Recycling Team
External Relations Division
Texas Commission on Environmental Quality
(512) 239-5895
lisa.robinson@tceq.texas.gov
www.tceq.texas.gov

How's our Customer service? Please fill out our **Customer Satisfaction Survey**.

Thomas Lee

From: CCWRD#1 Secretary <ccwrd1@gmail.com>
Sent: Friday, June 30, 2023 5:29 PM
To: Info
Subject: Resolution No. 2023-06-20 CCWRD1
Attachments: COMAL COUNTY WATER RECREATIONAL DISTRICT No. 1 (1).pdf

Comal County Water Recreational District No. 1

Island Manager

P.O. Box 310009 New Braunfels, TX 78131-0009

Website: www.ccwrd1.com

Secretary/Treasurer: ccwrd1@gmail.com 720.333.1041
theislandmanager@gmail.com 512.775.4344

To Whom It May Concern,

Please see the attached Resolution passed by Comal County Water Recreational District No. 1 on June 20, 2023.

Thank you,
Amie Sheck
District Secretary
CCWRD No. 1

cc: Richard Yonker, President

COMAL COUNTY WATER RECREATIONAL DISTRICT NO. 1
P.O. Box 310009 New Braunfels, TX 78131-0009
Secretary/Treasurer: ccwrd1@gmail.com (720) 333-1041
General Manager theislandmanager@gmail.com (512) 775-4344

RESOLUTION NO. 2023-06-20
COMAL COUNTY WATER RECREATIONAL DISTRICT NO. 1

RESOLUTION REGARDING A PROPOSED NEW WASTEWATER DISCHARGE INTO THE COMAL RIVER

WHEREAS, Comal County Water Recreational District No. 1 (the "District") is a conservation and reclamation district, created pursuant to Article XVI, Section 59 of the Texas Constitution, Senate Bill No. 419 (Act of March 18, 1937, 45th Leg. R.S.) (the "Act") and Chapter 49 of the Texas Water Code, as amended; and

WHEREAS, the District owns approximately 9.46 acres of land in Comal County, including Spring Island and 15' strips of land on either side of the Comal River, all as identified on that Special Warranty Deed recorded in the official public records of Comal County at 201606014675 on April 11, 2016 ("District Property"); and

WHEREAS, in addition to being the owner of the described property, the District has been charged with "protecting and preserving the purity and sanitary condition of the waters of the Comal River . . . and thereby protecting the health of those residing in such District, and maintaining such waters in good condition for the recreational purposes of swimming and fishing therein and boating thereon by those entitled to do so" as mo.e specifically described in the Act; and

WHEREAS, the District represents an area of the City of New Braunfels that includes over 300 properties, with a roster of 2,200 individuals that have rights to access District Property for recreational purposes on the Comal River and springs; and

WHEREAS, the District has been made aware of a new Texas Pollutant Discharge Elimination System wastewater permit application submitted by Mr. Douglas T. Harrison, number WQ0016211001 (the "Application"), which proposes to discharge up to 600,000 gallons per day of wastewater into a tributary of the Comal River, known as the West Fork Dry Comal Creek; and

WHEREAS, the Board is concerned about the Application and also the precedent it may set to allow new discharges into the Comal River, one of the cleanest and most pristine water bodies in the entire State of Texas, which river is also home to numerous listed endangered species.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the COMAL COUNTY WATER RECREATIONAL DISTRICT NO 1, acting in a duly noticed and called public meeting that:

Section 1. The facts recited above are hereby declared to be true and correct.

Section 2. The Board formally opposes the Application, and respectfully requests that the Texas Commission on Environmental Quality ("TCEQ") deny the Application.

Section 3. The Board's decision to oppose the Application is based on the following considerations:

A. Environmental Impact: The proposed wastewater discharge plan poses environmental risks and potential harm to sensitive ecosystems in the area. It is not clear that the applicant has any experience with the construction or operation of a wastewater treatment plant. If improperly managed, the discharge would introduce pollutants, chemicals, or contaminants into nearby water bodies which would endanger aquatic life, be harmful to recreational users, and disrupting the natural balance of the river ecosystem.

B. Water Quality and Public Health: If not properly managed, the wastewater discharge would have adverse effects on the quality of water resources in the region. This not only affects the ecological integrity of the water bodies but also jeopardizes the health and well-being of people in the local community, which rely on these water sources for drinking, recreational activities, and agricultural purposes.

Section 4. The General Manager and Secretary of the District are hereby authorized to make public a copy of this Resolution and ensure it is properly filed with the TCEQ Chief Clerk.

PASSED AND APPROVED THIS 20TH DAY OF JUNE, 2023.

VOTE: AYES: 2 NO: 1

President, Board of Directors

ATTEST:

Secretary, Board of Directors

(SEAL) COMAL COUNTY WATER RECREATIONAL DISTRICT NO. 1 TEXAS

36592990v.1

Thomas Lee

From: PUBCOMMENT-OCC
Sent: Thursday, July 6, 2023 8:14 AM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: FW: Public comment on Permit Number WQ0016211001
Attachments: COMAL COUNTY WATER RECREATIONAL DISTRICT No. 1 (1) (3)1.pdf

From: ccwrd1@gmail.com <ccwrd1@gmail.com>
Sent: Wednesday, July 5, 2023 3:43 PM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Amie Sheck

EMAIL: ccwrd1@gmail.com

COMPANY: Comal County Water Recreational District No 1

ADDRESS: PO BOX 310009
NEW BRAUNFELS TX 78131-0009

PHONE: 5127754344

FAX:

COMMENTS: Please see the attached Resolution passed by Comal County Water Recreational District No. 1 on June 20, 2023.

COMAL COUNTY WATER RECREATIONAL DISTRICT NO. 1
P.O. Box 310009 New Braunfels, TX 78131-0009
Secretary/Treasurer: ccwrd1@gmail.com (720) 333-1041
General Manager theislandmanager@gmail.com (512) 775-4344

RESOLUTION NO. 2023-06-20
COMAL COUNTY WATER RECREATIONAL DISTRICT NO. 1

RESOLUTION REGARDING A PROPOSED NEW WASTEWATER DISCHARGE INTO THE COMAL RIVER

WHEREAS, Comal County Water Recreational District No. 1 (the "District") is a conservation and reclamation district, created pursuant to Article XVI, Section 59 of the Texas Constitution, Senate Bill No. 419 (Act of March 18, 1937, 45th Leg. R.S.) (the "Act") and Chapter 49 of the Texas Water Code, as amended; and

WHEREAS, the District owns approximately 9.46 acres of land in Comal County, including Spring Island and 15' strips of land on either side of the Comal River, all as identified on that Special Warranty Deed recorded in the official public records of Comal County at 201606014675 on April 11, 2016 ("District Property"); and

WHEREAS, in addition to being the owner of the described property, the District has been charged with "protecting and preserving the purity and sanitary condition of the waters of the Comal River . . . and thereby protecting the health of those residing in such District, and maintaining such waters in good condition for the recreational purposes of swimming and fishing therein and boating thereon by those entitled to do so" as more specifically described in the Act; and

WHEREAS, the District represents an area of the City of New Braunfels that includes over 300 properties, with a roster of 2,200 individuals that have rights to access District Property for recreational purposes on the Comal River and springs; and

WHEREAS, the District has been made aware of a new Texas Pollutant Discharge Elimination System wastewater permit application submitted by Mr. Douglas T. Harrison, number WQ0016211001 (the "Application"), which proposes to discharge up to 600,000 gallons per day of wastewater into a tributary of the Comal River, known as the West Fork Dry Comal Creek; and

WHEREAS, the Board is concerned about the Application and also the precedent it may set to allow new discharges into the Comal River, one of the cleanest and most pristine water bodies in the entire State of Texas, which river is also home to numerous listed endangered species.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the COMAL COUNTY WATER RECREATIONAL DISTRICT NO 1, acting in a duly noticed and called public meeting that:

Section 1. The facts recited above are hereby declared to be true and correct.

Section 2. The Board formally opposes the Application, and respectfully requests that the Texas Commission on Environmental Quality ("TCEQ") deny the Application.

Section 3. The Board's decision to oppose the Application is based on the following considerations:

A. Environmental Impact: The proposed wastewater discharge plan poses environmental risks and potential harm to sensitive ecosystems in the area. It is not clear that the applicant has any experience with the construction or operation of a wastewater treatment plant. If improperly managed, the discharge would introduce pollutants, chemicals, or contaminants into nearby water bodies which would endanger aquatic life, be harmful to recreational users, and disrupting the natural balance of the river ecosystem.

B. Water Quality and Public Health: If not properly managed, the wastewater discharge would have adverse effects on the quality of water resources in the region. This not only affects the ecological integrity of the water bodies but also jeopardizes the health and well-being of people in the local community, which rely on these water sources for drinking, recreational activities, and agricultural purposes.

Section 4. The General Manager and Secretary of the District are hereby authorized to make public a copy of this Resolution and ensure it is properly filed with the TCEQ Chief Clerk.

PASSED AND APPROVED THIS 20TH DAY OF JUNE, 2023.

VOTE: AYES: 2 NO: 1

President, Board of Directors

ATTEST:

Secretary, Board of Directors

(SEAL) COMAL COUNTY WATER RECREATIONAL DISTRICT NO. 1 TEXAS

36592990v.1

Jennifer Cox

From: PUBCOMMENT-OCC
Sent: Tuesday, October 8, 2024 1:24 PM
To: PUBCOMMENT-OCC2; PUBCOMMENT-OPIC; PUBCOMMENT-ELD; PUBCOMMENT-WQ
Subject: FW: Public comment on Permit Number WQ0016211001

Jesús Bárcena
Office of the Chief Clerk
Texas Commission on Environmental Quality
Office Phone: 512-239-3319

How is our customer service? Fill out our online customer satisfaction survey at:
www.tceq.texas.gov/customersurvey

From: nzanetta@hotmail.com <nzanetta@hotmail.com>
Sent: Monday, October 7, 2024 5:52 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Nancy Zanetta

EMAIL: nzanetta@hotmail.com

COMPANY:

ADDRESS: 315 CURVATURA
NEW BRAUNFELS TX 78132-0023

PHONE: 2098142572

FAX:

COMMENTS: I implore you not to issue this permit. This dry creek runs directly through the property that we keep our horses at. When there is water in this creek our horse play in it along with the children that live there. The discharge will be released directly above our property that the owner has lived at for 15 years. I ask for a public meeting to be held to voice our concerns over the impact this will have on our property, horses and children that live there.

Jennifer Cox

From: Brad Patterson
Sent: Tuesday, October 22, 2024 3:43 PM
To: PUBCOMMENT-WQ; PUBCOMMENT-ELD; PUBCOMMENT-OCC2; PUBCOMMENT-OPIC
Subject: CORRECTION: Public comment on Permit Number WQ0016211001

PM

From: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Sent: Tuesday, October 8, 2024 1:24 PM
To: PUBCOMMENT-OCC2 <PUBCOMMENT-OCC2@tceq.texas.gov>; PUBCOMMENT-OPIC <PUBCOMMENT-OPIC@tceq.texas.gov>; PUBCOMMENT-ELD <PUBCOMMENT-ELD@tceq.texas.gov>; PUBCOMMENT-WQ <PUBCOMMENT-WQ@tceq.texas.gov>
Subject: FW: Public comment on Permit Number WQ0016211001

Jesús Bárcena
Office of the Chief Clerk
Texas Commission on Environmental Quality
Office Phone: 512-239-3319

How is our customer service? Fill out our online customer satisfaction survey at:
www.tceq.texas.gov/customersurvey

From: nzanetta@hotmail.com <nzanetta@hotmail.com>
Sent: Monday, October 7, 2024 5:52 AM
To: PUBCOMMENT-OCC <PUBCOMMENT-OCC@tceq.texas.gov>
Subject: Public comment on Permit Number WQ0016211001

REGULATED ENTY NAME HARRISON TRACT WWTF

RN NUMBER: RN111566147

PERMIT NUMBER: WQ0016211001

DOCKET NUMBER:

COUNTY: COMAL

PRINCIPAL NAME: HARRISON, DOUGLAS T

CN NUMBER: CN606056729

NAME: Nancy Zanetta

EMAIL: nzanetta@hotmail.com

COMPANY:

ADDRESS: 315 CURVATURA
NEW BRAUNFELS TX 78132-0023

PHONE: 2098142572

FAX:

COMMENTS: I implore you not to issue this permit. This dry creek runs directly through the property that we keep our horses at. When there is water in this creek our horse play in it along with the children that live there. The discharge will be released directly above our property that the owner has lived at for 15 years. I ask for a public meeting to be held to voice our concerns over the impact this will have on our property, horses and children that live there.