2016-CU-009

Project Name:	"Holley-Navarre Water System, Inc., "
Applicant and/or Property Owner:	Paul Gardner
Representative:	n/a
Conditional Use Request:	Conditional Use to allow a private utility, specifically a RIB system (Rapid Infiltration Basin), to be located within an R1 zoning district (LDC 6..09.02.J)
Zoning District:	R1 (Single Family Residential)
Zoning Board Recommendation:	**Recommended Approval with a vote of 4 – 2; Richardson and Hawkins opposing**

Conditional Use 2016-CU-009

Part I. General Information:

Project/Applicant:	"Holley-Navarre Water System, Inc."
Representative:	Paul Gardner
Location:	7900 Block of Williams Creek Drive, Navarre, FL
Parcel(s):	02-1N-28-0000-06904-0000
Zoned:	R1 (Single Family Residential)
Conditional Use Request:	**Conditional Use to allow a private utility, specifically a RIB system (Rapid Infiltration Basin), to be located within an R1 zoning district (LDC 6..09.02.J)**
District:	Commissioner District #4
Current Conditions:	Vacant
Zoning Board Recommendation:	**Recommended Approval with a vote of 4 – 2; Richardson and Hawkins opposing**

Part II. Data and Analysis: (Consistency with the Land Development Code Criteria)

6.09.00 CONDITIONAL USES

6.09.01 General Provisions Regulating Conditional Uses: A conditional use shall be reviewed by the Zoning Board of Adjustment and a recommendation for approval made to the Board of County Commissioners provided the Board finds that the use:

A. Is so designed, located, and proposed to be operated so that the public health, safety, and welfare will be protected;

Is this criterion met? **Yes**

Staff Analysis: It is anticipated that the proposed use will be designed, located and operated so that the public health, safety, and welfare will be protected.

The applicant is requesting to develop rapid infiltration basin on this property to accommodate their existing service area.

B. Will not unduly adversely affect other property in the impacted area which it is located;

Is this criterion met? **Yes**

Staff Analysis: The subject site is abutted by vacant, residentially zoned land.

It is not anticipated that the proposed use will unduly or adversely affect other property in the impacted area in which it is located.

C. Is consistent with the Goals, Objectives, and Policies of the Santa Rosa County Comprehensive Plan;

Is this criterion met? Yes

Staff Analysis: According the Santa Rosa County Future Land Use Map (FLUM) the subject area for the proposed Conditional Use is located within a SFR (Single Family Residential) land use category. The request is consistent with the Goals, Objectives and Policies of the Santa Rosa Comprehensive Plan.

D. Satisfies criteria stipulated for similar uses as described in the following section.

6.09.02.J <u>Public and Private Utilities and Public Facilities (AG, AG-2, ER, RR-1, R-1, R-1A, R-1M, R-2, R-2M, R-3, NC, HCD, PID and C-1M</u>)

1. The location of such facility shall be situated on a site providing the most effective service to such area. The applicant shall demonstrate that such proposed sites are located effectively relative to the service area and that the site proposed is at least equal to the effectiveness of other alternative sites.

   Is this criterion met? Yes

   Staff Analysis: Per the applicant's statement, the proposed basins are proposed to be located within the most suitable area.

2. The location of such facility shall not unreasonably increase traffic on streets in the impacted area.

   Is this criterion met? Yes

   Staff Analysis: The site meets this requirement.

3. The scale, intensity and operation of the use shall not generate unreasonable noise, traffic, congestion or other potential nuisances or hazards to contiguous residential properties.

   Is this criterion met? Yes

   Staff Analysis: This site meets this requirement.

4. General office facilities of a utility shall be located in commercial districts.

   Is this criterion met? Yes

Staff Analysis: The proposed use is not a general office facility.

5. County facilities shall be allowed in any district.

   Is this criterion met? n/a

   Staff Analysis: The applicant is not Santa Rosa County.

6. There shall be no time limit placed upon the approval of the Board of Adjustments for public and private utilities.

   Is this criterion met? Yes

   Staff Analysis: If this request is approved the applicant plans to move forward with this project in a reasonable amount of time to best serve their customers.

7. No height variance is required for a conditional use approval for a water tower.

   Is this criterion met? n/a

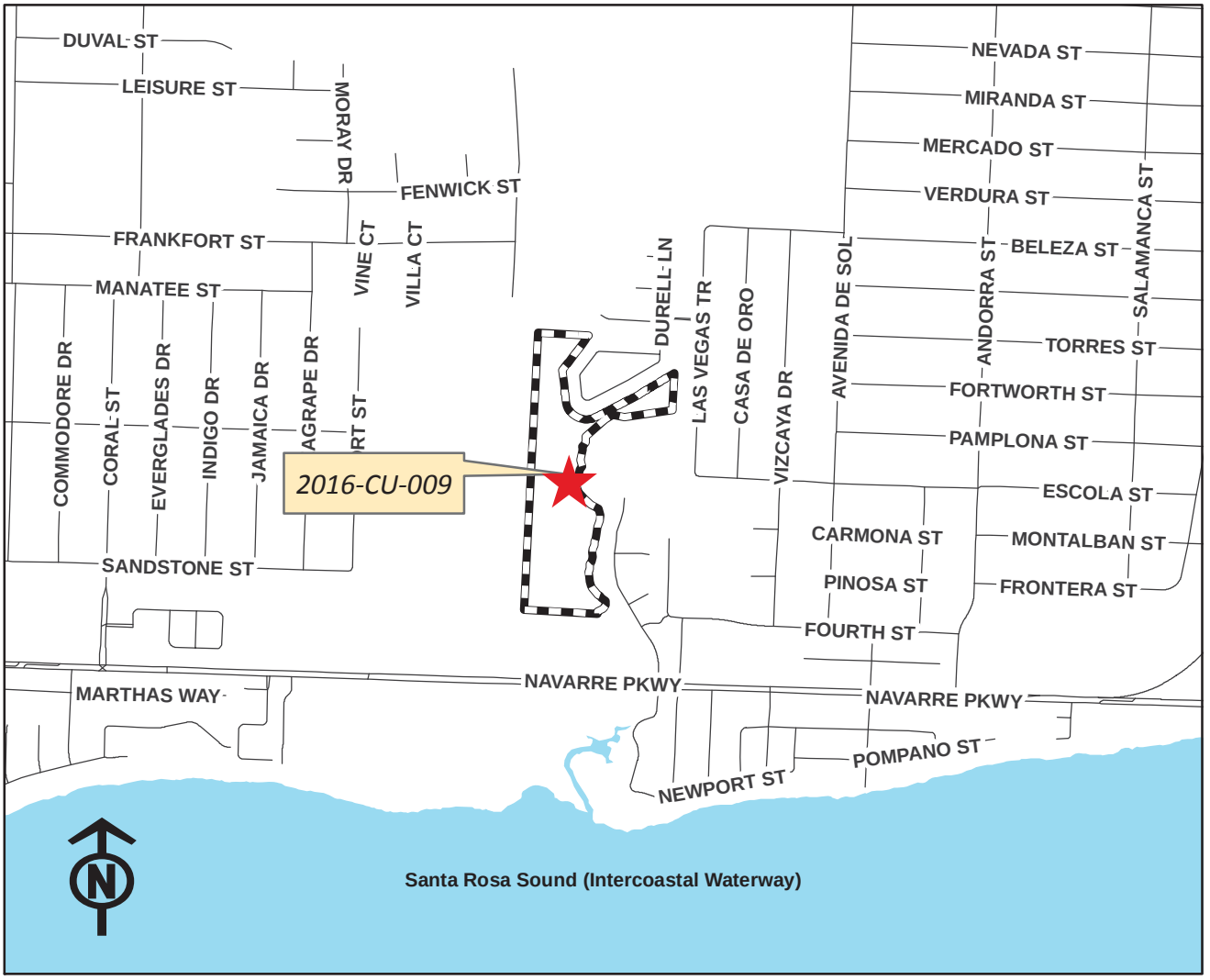
   Staff Analysis: The applicant is not requesting approval for a water tower.

Part III. Additional Considerations

If the Conditional Use is approved, are there any potential building code issues?

It is not anticipated that there will be any potential building code issues since no buildings are proposed. The proposed use will go through the commercial site plan process.

2016-CU-009
Location



0 1,350 2,700 5,400 8,100 10,800 Feet

Legend

Pending Apr ZB

Streets

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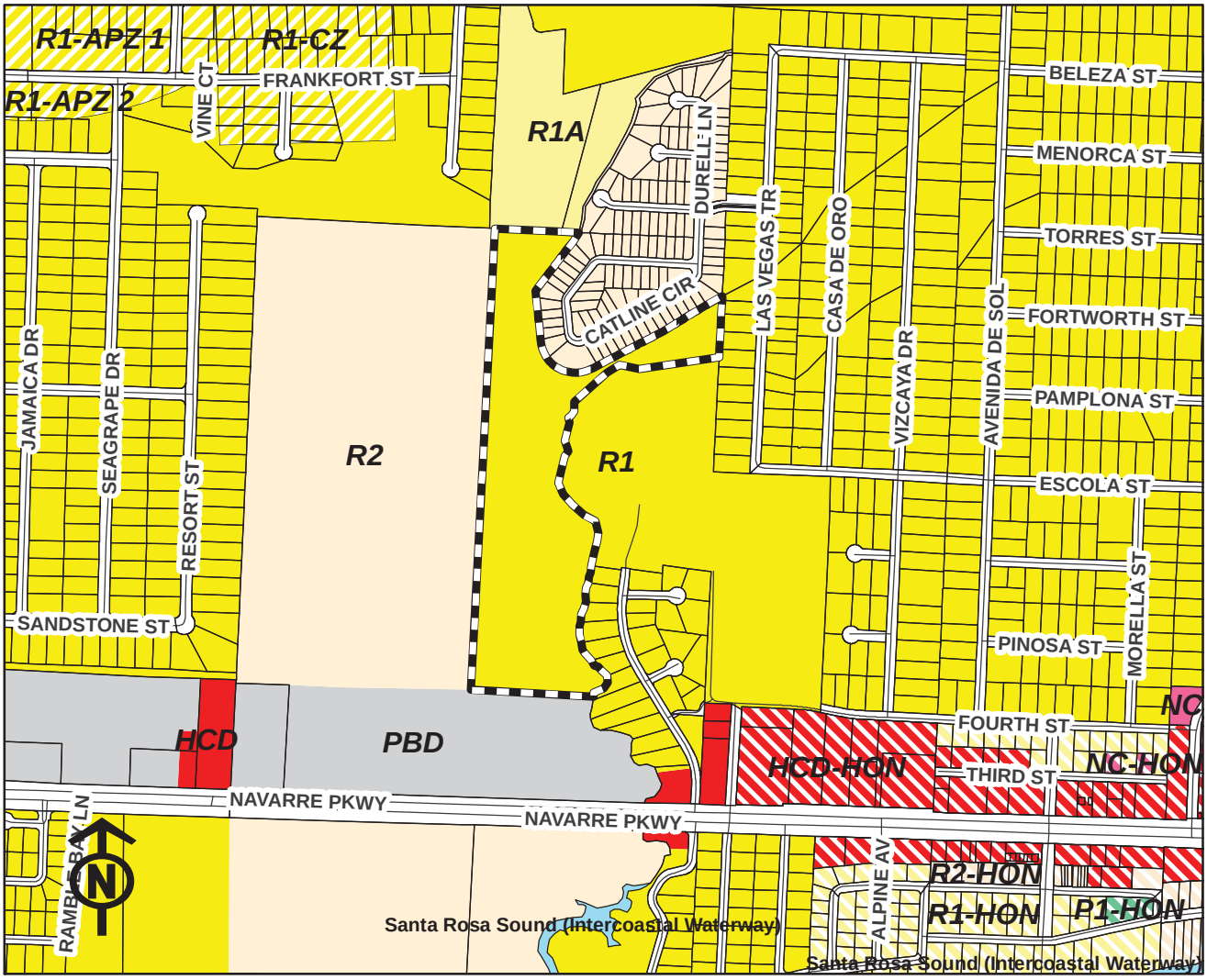
2016-CU-009
Zoning



0 800 1,600 3,200 4,800 6,400 Feet

Legend

- Pending Apr ZB
- Parcel Lines
- Streets
- AG-RR
- AG-RR-APZ1; AG-RR-APZ2; AG-RR-CZ
- AG1
- AG2
- AG2-APZ or CZ
- C1M
- C2M
- CITY
- HC1
- HCD
- HCD-APZ or CZ
- HCD-HON
- HNB
- HR1
- HR2
- M1
- M1-APZ or CZ
- M1-HON
- M2
- M2-APZ or CZ
- MID
- MIL
- NB-C
- NB-CON/REC
- NB-HD
- NB-MD
- NB-MHD
- NB-PMUD
- NB-SF
- NB-U
- NC
- NC-APZ or CZ
- NC-HON
- P1
- P1-HON
- P2
- P2-APZ or CZ
- P2-HON
- PBD
- PID
- PUD
- R1
- R1-APZ or CZ
- R1-HON
- R1A
- R1A-HON
- R1M
- R1M-APZ or CZ
- R1M-HON
- R2
- R2-APZ or CZ
- R2-HON
- R2M
- R2M-APZ or CZ
- R3
- RAIL
- RR1
- RR1-APZ or CZ
- STATE
- STATE-APZ or CZ
- TC1-HON
- WATER

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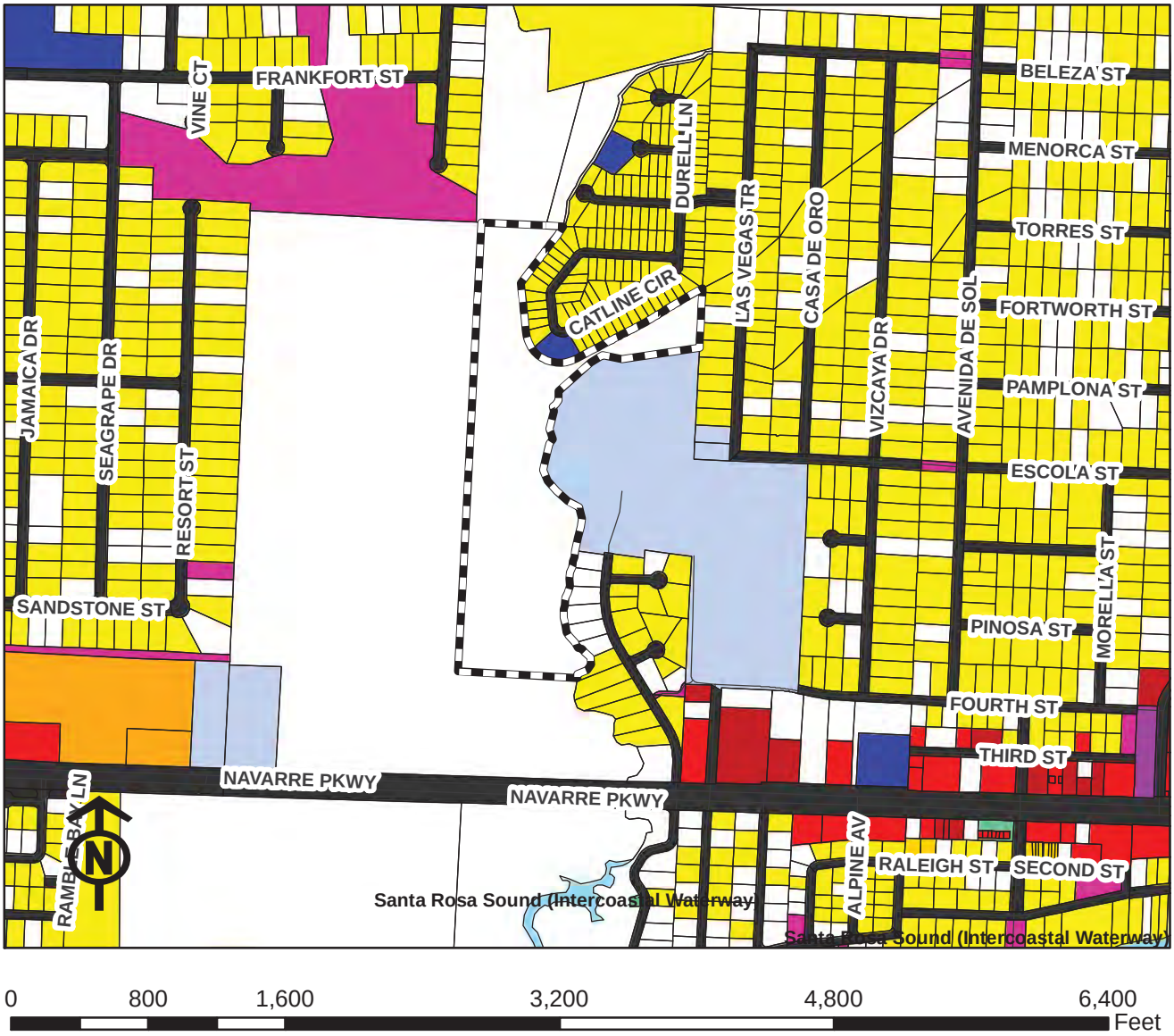
2016-CU-009
Existing Land Use



0 800 1,600 3,200 4,800 6,400 Feet

Legend

- Pending Apr ZB
- Parcel Lines
- Streets

Existing Land Use

Category

- Agriculture (AG)
- Agriculture, Homestead (AH)
- Condo's/Townhomes (C/T)
- City
- Commercial (COMM)
- Industrial (INDUS)
- Institutional (INST)
- Multi-Family Residential (MFR <5)
- Multi-Family Residential (MFR >5)
- Military (MIL)
- Mixed Residential/Commercial (MRC)
- Office
- Public Owned Property (POP)
- Rail
- Recreation/Commercial (REC/COMM)
- Recreation/Open Space (REC/OS)
- Right of Way (ROW)
- Single Family Residential (SFR)
- Silviculture (SILVICUL)
- Uncategorized (UNCAT)
- Utilities
- Vacant
- Water

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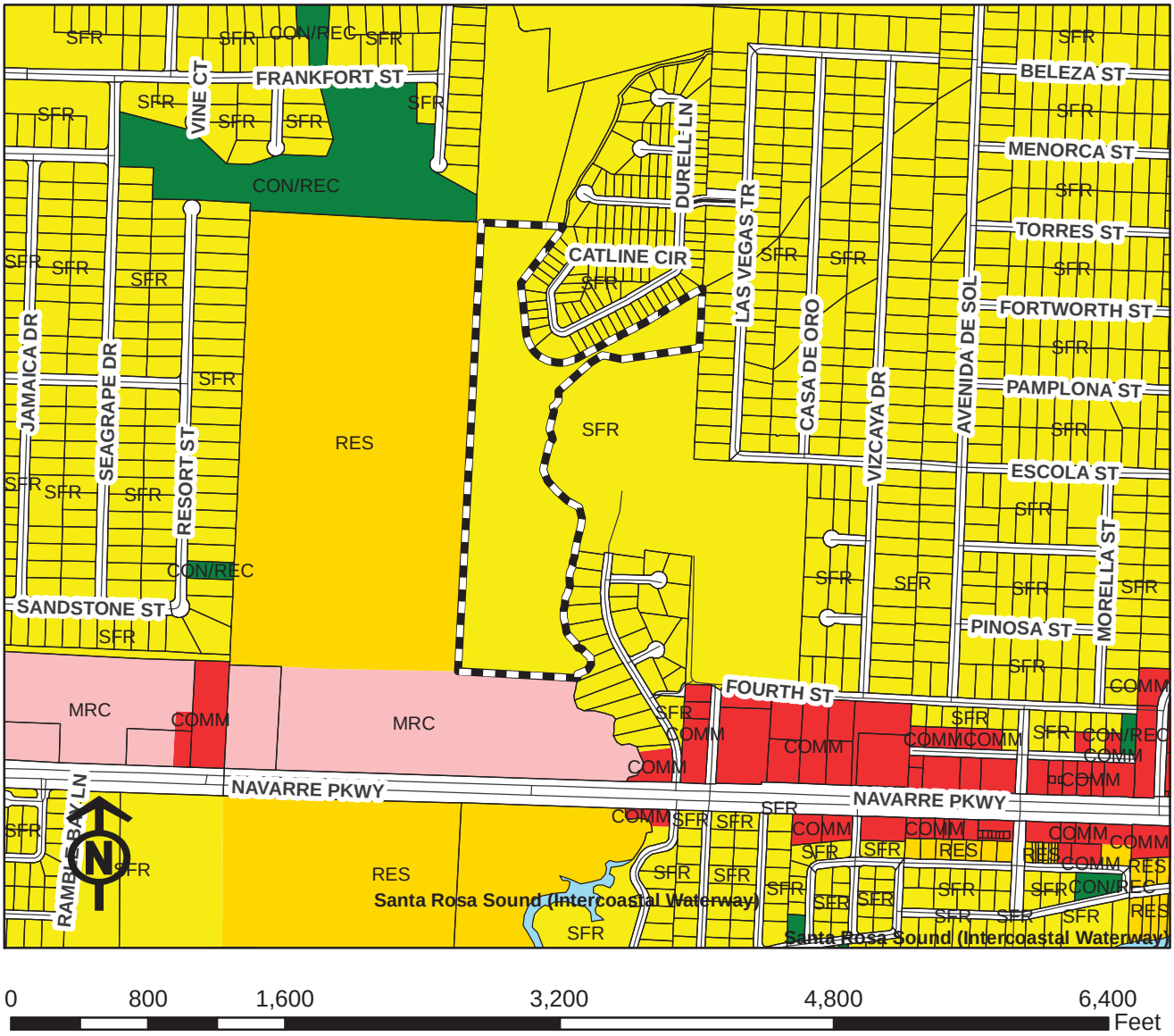
2016-CU-009
Future Land Use



Legend

- Pending Apr ZB
- Parcel Lines
- Streets
- AGRICULTURE (AG)
- SINGLE FAMILY RESIDENTIAL (SFR)
- MEDIUM DENSITY RESIDENTIAL
- RESIDENTIAL (RES)
- COMMERCIAL (COMM)
- CONSERVATION/RECREATION (CON/REC)
- GP SINGLE FAMILY RESIDENTIAL (GPSFR)
- GP RURAL RESIDENTIAL (GPRR)
- BAGDAD HISTORIC DISTRICT (HIS)
- INDUSTRIAL (INDUS)
- MARINA (MARINA)
- MILITARY (MIL)
- MIXED RESIDENTIAL COMMERCIAL (MRC)
- NAVARRE BEACH COMMERCIAL (NBCOMM)
- NAVARRE BEACH LOW DENSITY RESIDENTIAL (NBLDR)
- NAVARRE BEACH MEDIUM DENSI
- NAVARRE BEACH MEDIUM/HIGH D
- NAVARRE BEACH HIGH DENSITY
- NAVARRE BEACH MIXED RESIDEN
- NAVARRE BEACH UTILITIES (NBU
- CITY
- RAIL
- WATER

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2016-CU-009
Aerial, Closer View

0 500 1,000 2,000 3,000 4,000 Feet

Legend

- Pending Apr ZB
- Parcel Lines
- Streets

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2016-CU-009
Aerial

0 800 1,600 3,200 4,800 6,400 Feet

Legend

- Pending Apr ZB
- Parcel Lines
- Streets

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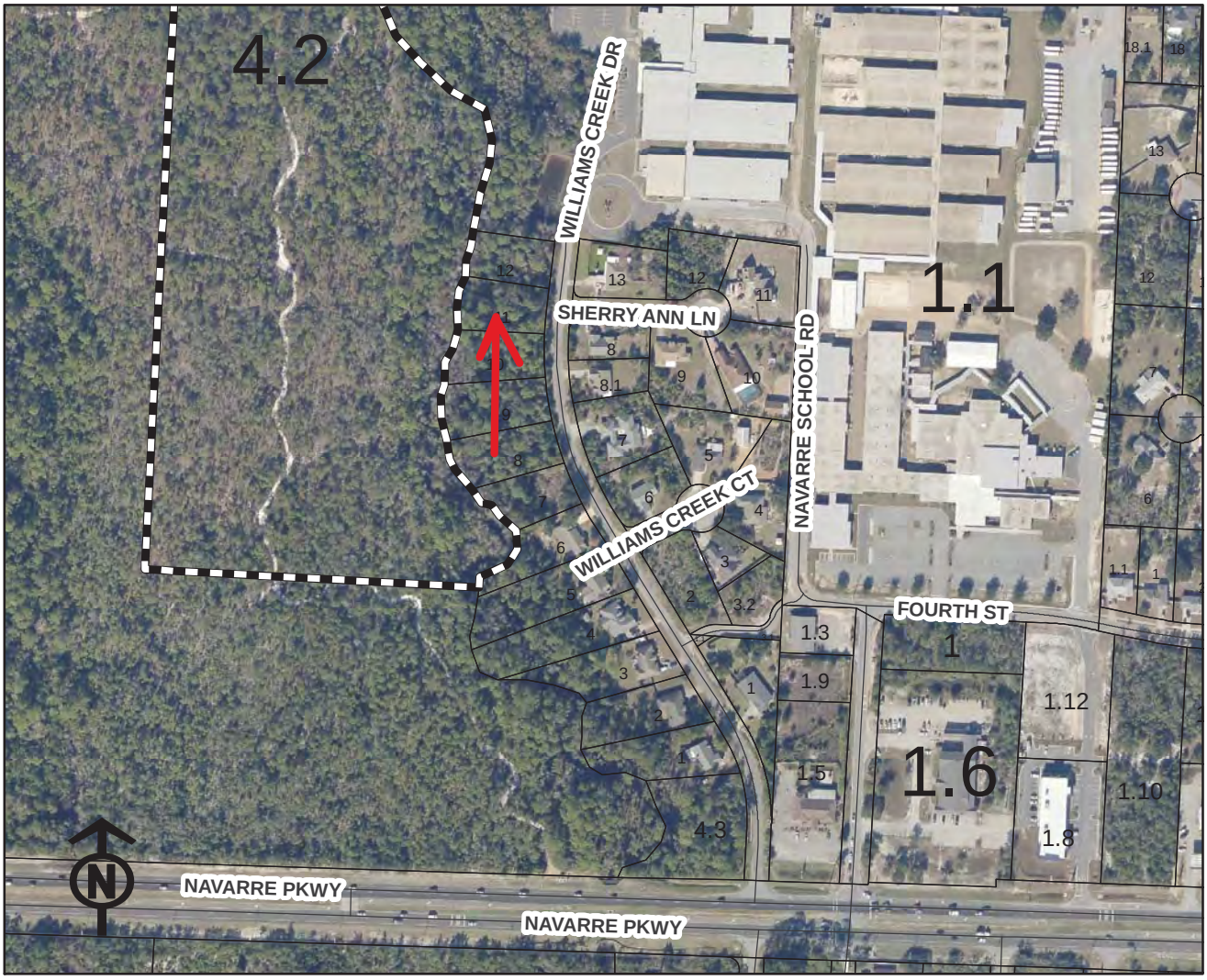
2016-CU-009
Easement Location



0 295 590 1,180 1,770 2,360 Feet

Legend

Pending Apr ZB

Parcel Lines

Streets

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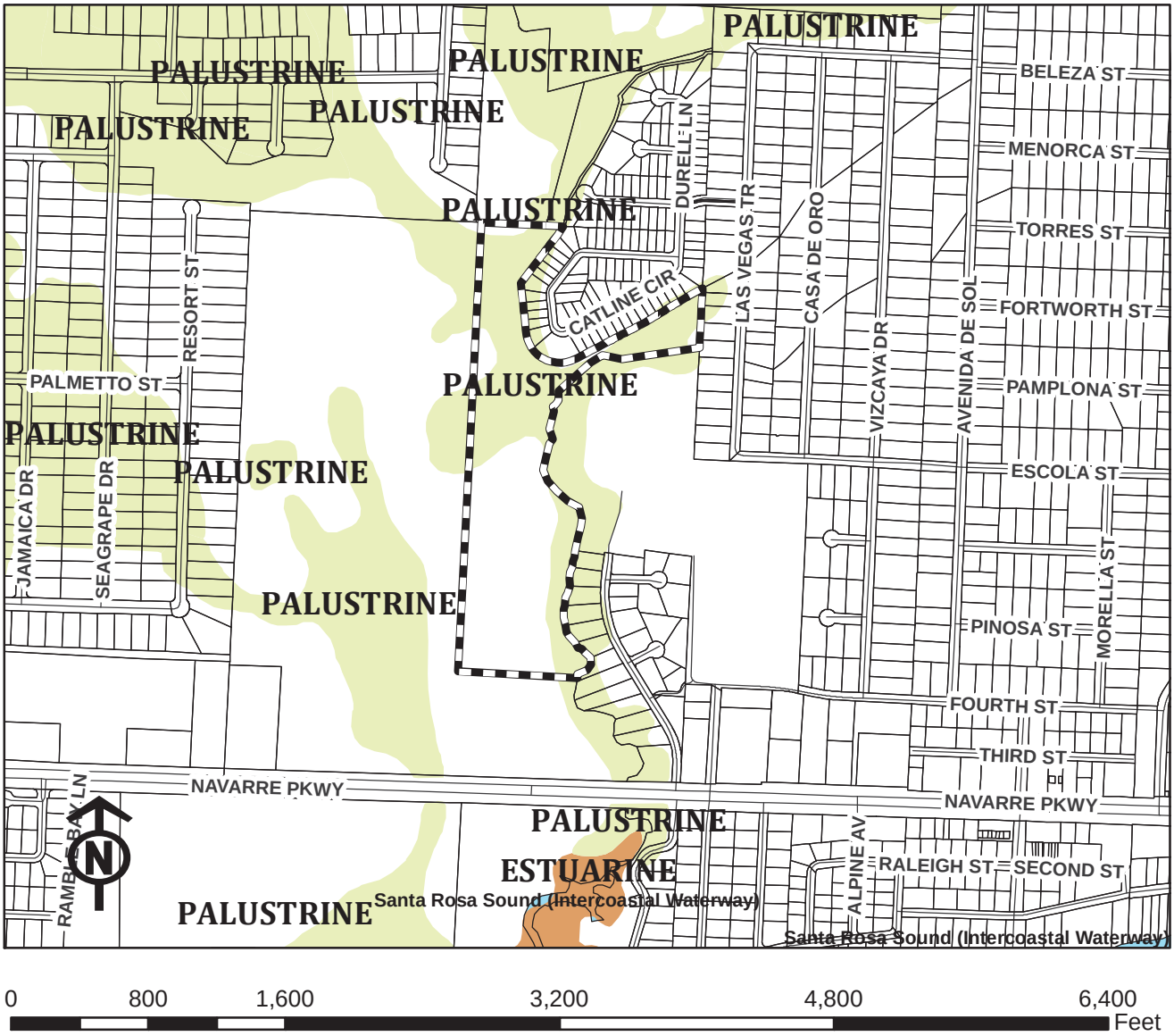
2016-CU-009
National Wetlands Inventory Data



Legend

- Pending Apr ZB
- Parcel Lines
- Streets

NWI-based Potential Wetlands

DESCRIPT

- ESTUARINE
- LACUSTRINE
- PALUSTRINE
- RIVERINE
- MARINE

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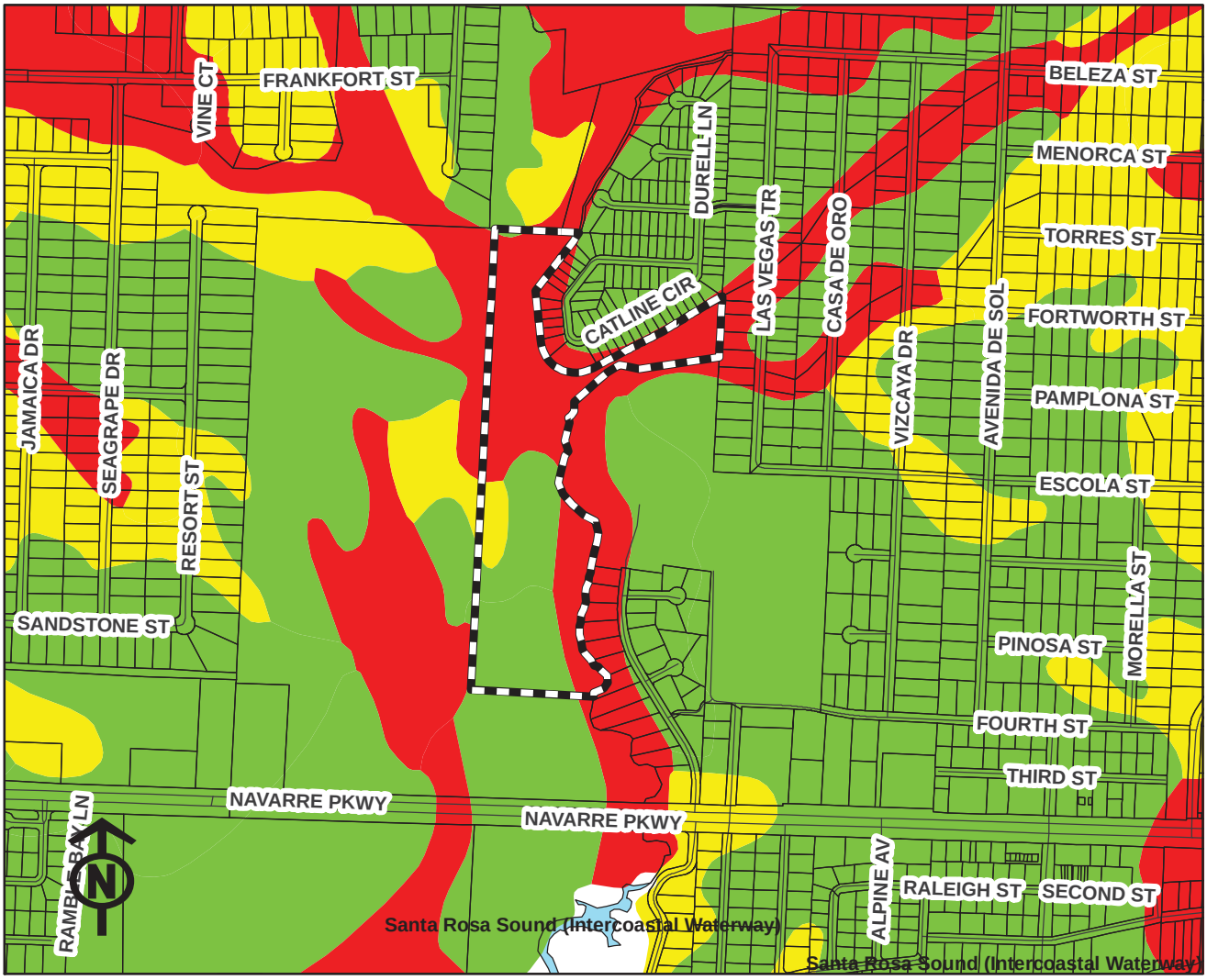
2016-CU-009
Soils-Based Wetland Potential Data



0 800 1,600 3,200 4,800 6,400 Feet

Legend

Pending Apr ZB

Parcel Lines

Streets

SOILS-based Potential Wetlands

HYDRIC CLASSIFICATION

All hydric

Partially hydric

Not hydric

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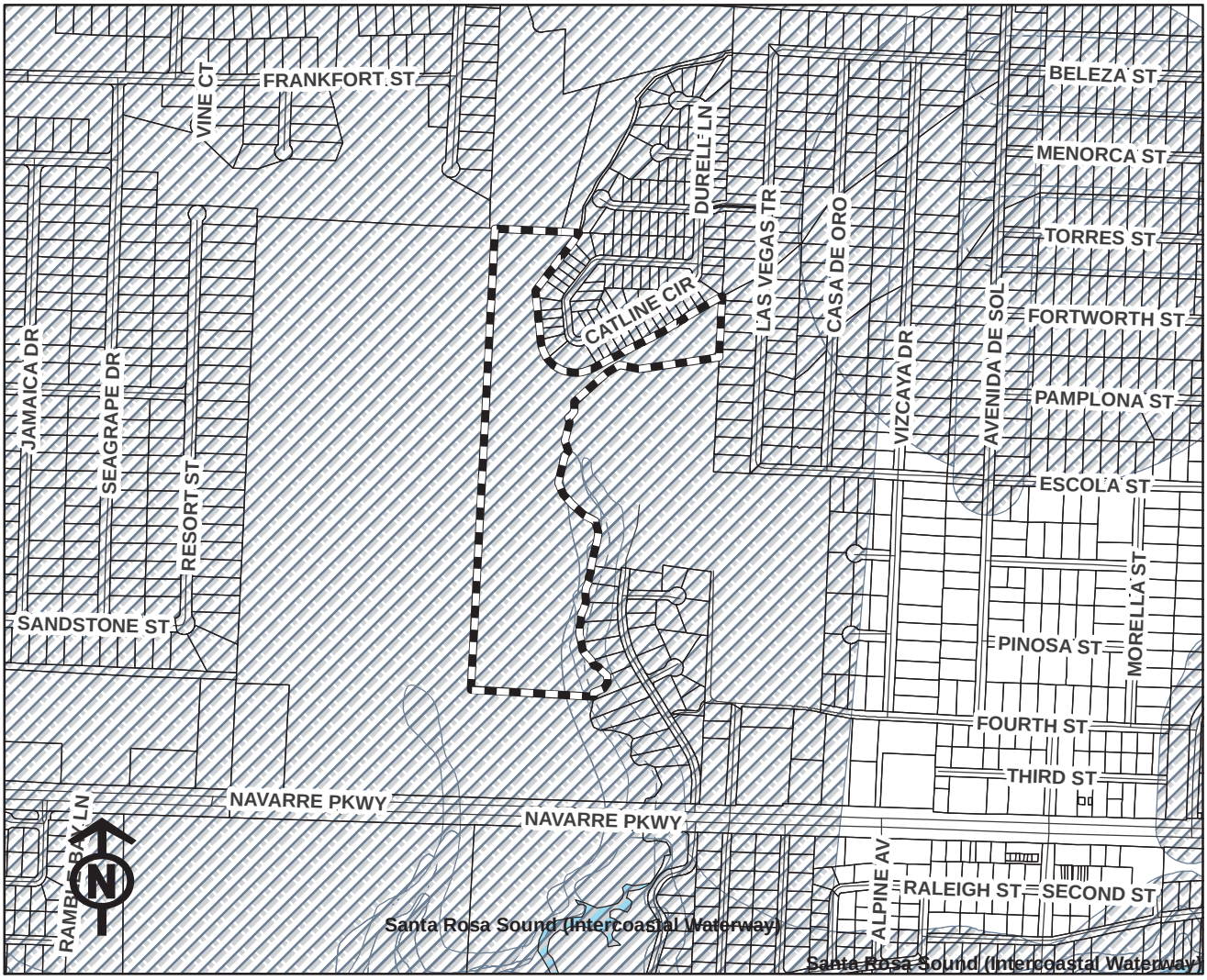
2016-CU-009
Stormwater Problem Area



0 800 1,600 3,200 4,800 6,400 Feet

Legend

- Pending Apr ZB
- Parcel Lines
- Streets
- Approved Parcel Divide
- Stormwater Problem Area

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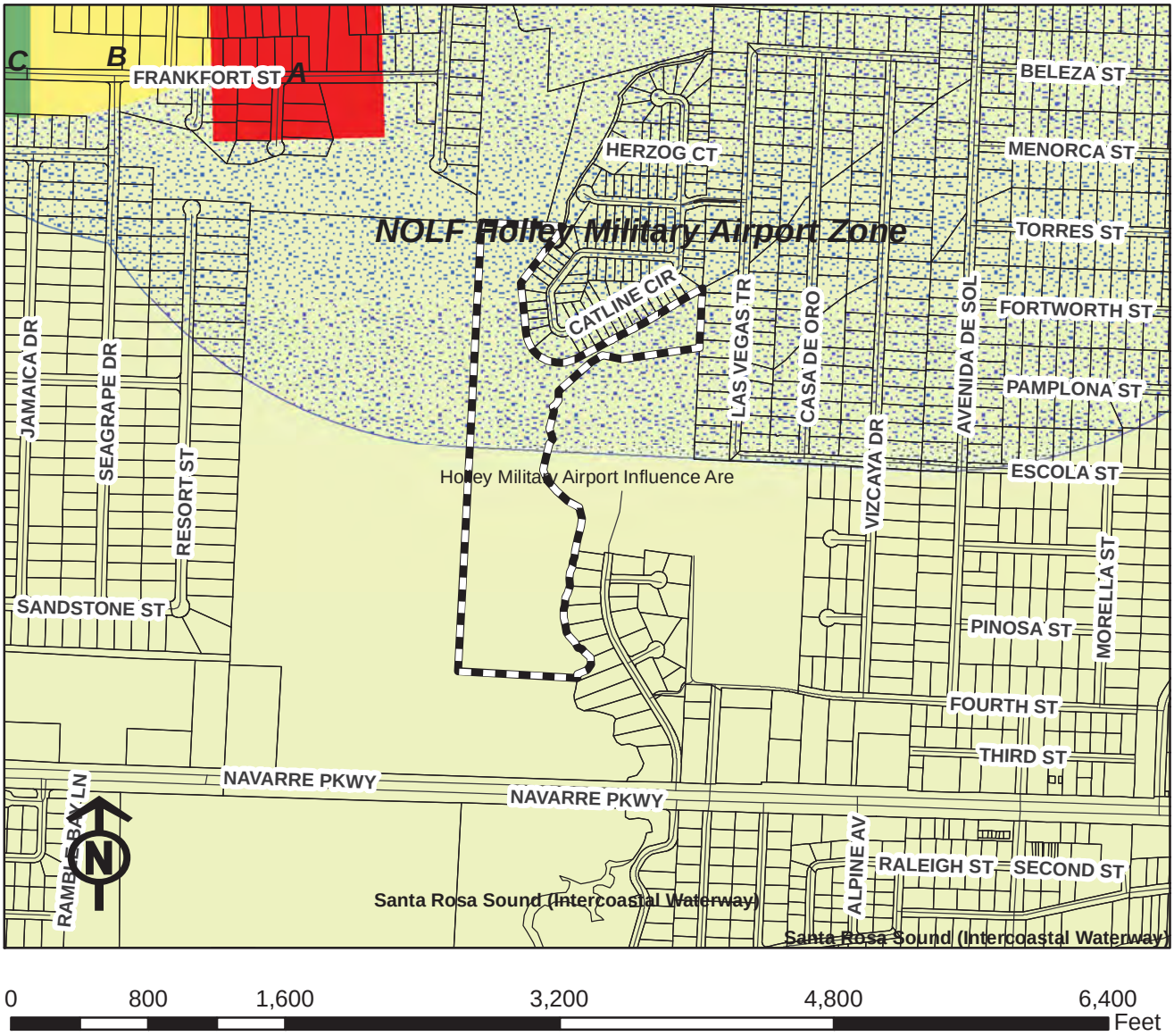
2016-CU-009
Airfield Data



Legend

- Pending Apr ZB
- Parcel Lines
- Streets
- A - Clear Zone - High Accident Potential
- B - APZ 1 - Significant Accident Potential
- C - APZ 2 - Measurable Accident Potential
- Approach Surface
- Military/Private Airport Zone
- Private/Military Airport Influence Area

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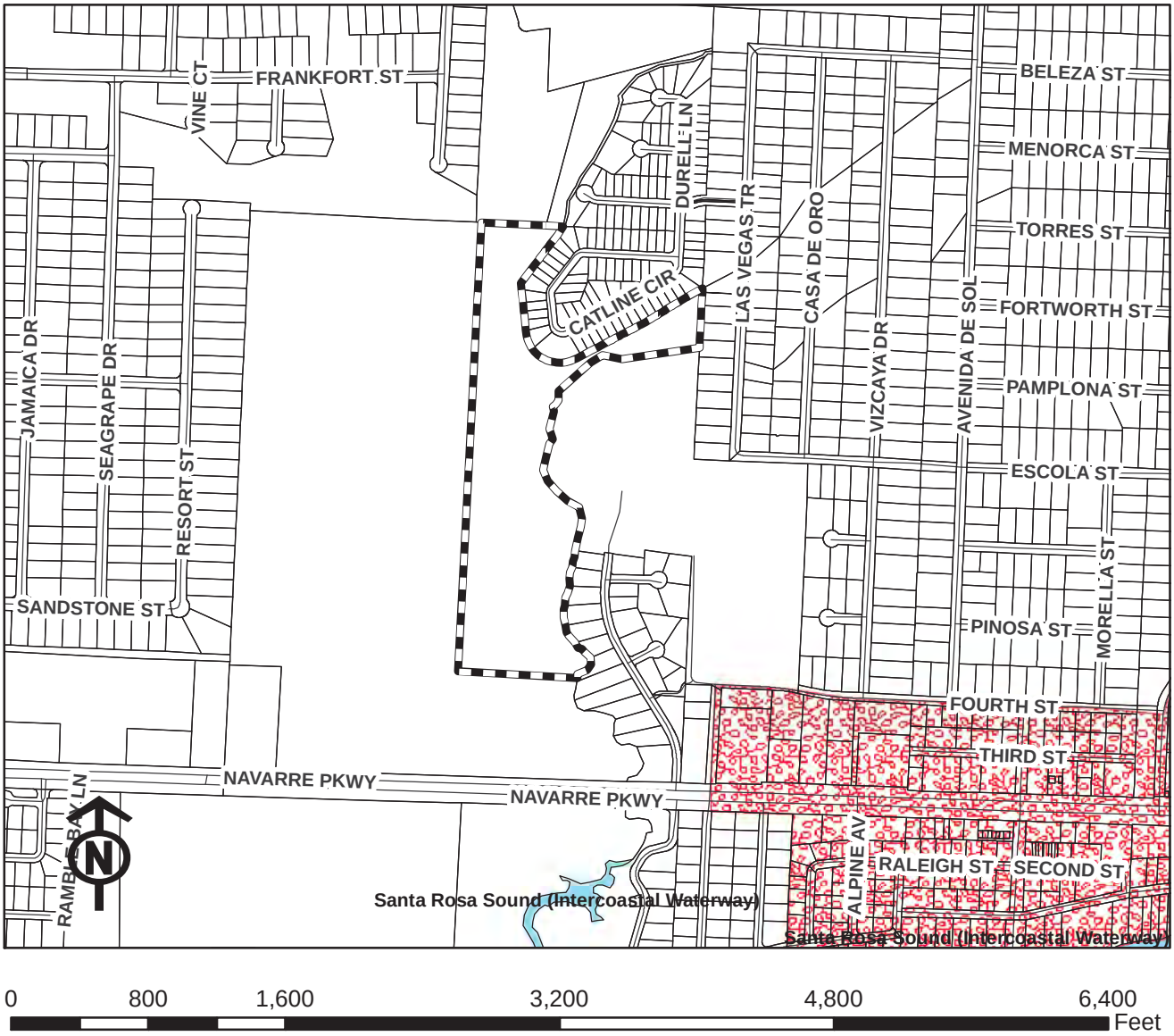
2016-CU-009
Special Overlay Districts



Legend

- Pending Apr ZB
- Parcel Lines
- Streets
- 500 Ft Buffer Wells
- East Milton Wellfield Protection Area

Descript

- Navarre Town Center
- Heart of Navarre
- RPZ Boundary

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The front of the property where the easement into the site is located

These are the properties adjacent along Williams Creek Drive

Also properties along Williams Creek Drive

These are the properties located around the easement area

The property adjacent to the south; this property fronts along Navarre Parkway

The RIBs located along Gordon Evans Road

Another view of the same

This is the google earth view of the existing RIB facility on Gordon Evans Road

And this and the next slide are the street view images of that system

HOLLEY-NAVARRE WATER SYSTEM, Inc.

8574 TURKEY BLUFF ROAD • NAVARRE, FLORIDA 32566
PHONE: (850) 939-2427 • FAX (850) 939-9541
www.hnws-fl.com

April 18, 2016
140001-032

Leslie Statler, Planner III
Development Services
Santa Rosa County Public Service Complex
6051 Old Bagdad Highway, Suite 202
Milton, Florida 32583

RE: Holley-Navarre Water System (HNWS) Greskovich Rapid Infiltration Basins (RIBs)
Conditional Use Approval (2016-CU-009)

Dear Leslie:

At the Zoning Board Meeting on Thursday, April 14, 2016, several residents from the William's Creek Estates subdivision voiced their concerns regarding the RIB project and the perceived impact it will have on their homes and property. A summary of their concerns as we understand them and a response follows. We hope that the following additional information will help to clear up the misinformation that surrounds this project and to eliminate or at least alleviate the resident's concerns.

1. Impacts to the Environment – A number of the residents expressed concerns regarding the impact of the treated wastewater (i.e. reclaimed water or effluent) on the environment and ecosystem of William's Creek. First of all it is important to note that the Florida Department of Environmental Protection (FDEP) required HNWS to complete an Environmental Assessment of the surrounding ecosystems, namely William's Creek and an unnamed tributary, as part of the permitting process for this RIB system. This study, completed in 2004 concluded that the RIB project would have no adverse effect on the ecosystem.

   Additionally, the Holley-Navarre Wastewater Treatment Plant is an Advanced Wastewater Treatment (AWT) facility and provides treatment well in excess of that required for RIBs. This level of treatment is not required by the state, but is instead provided by HNWS voluntarily. HNWS feels that this additional level of treatment provides additional safeguards to the public since the effluent from our plant is allowed to be used for the irrigation of residential homes, golf courses and other public spaces.

Furthermore, the wastewater treatment plant is designed with appropriate failsafes such that it is not possible to send untreated wastewater into the downstream disposal systems.

Many concerns were also mentioned regarding the treatment of wastewater with chemicals. The process that the HNWS plant utilizes includes no chemical addition as part of the treatment process. The process treats the wastewater through the use of biological natural processes. Prior to the release of the wastewater as effluent it is treated with Chlorine to disinfect the water and neutralize any remaining pathogens or bacteria. The treatment process generates solids known as sludge which are dried on site prior to delivery to a farm in Defuniak Springs where is applied to farmland as fertilizer. During the drying process a small amount of polymer is added to the sludge to help accelerate the drying process. Otherwise, there are no chemicals added to the process.

As an added safeguard, this project also includes the installation of four (4) monitoring wells which were installed in 2005 to allow for the continued monitoring of William's Creek, upstream of the RIBs as well as downstream, to ensure that the RIB system is not detrimentally affecting the creek or the downstream ecosystems.

2. Provide Relief to the Hidden Creek Golf Course – There seems to be some sentiment from the nearby residents that this project is intended to shift effluent disposal from other locations within the HNWS franchise to the proposed RIB location. This concept is completely false. HNWS has an area-wide effluent disposal permit, which means that we can dispose of effluent throughout the Franchise area in a number of ways. Presently, treated effluent is disposed of at the Hidden Creek Golf Course, into the aesthetic ponds located at Sunrise Drive and Highway 98, and onto the Holley-By-The-Sea recreation center fields. No other areas were ever developed for disposal. HNWS is getting close to reaching the allowable disposal limit at these three locations. As a result, other disposal areas are needed to keep up with the growth of the Holley-Navarre area. This rapid infiltration basin project was identified as a disposal option more than 10 years ago and included in HNWS' area-wide effluent disposal plan. The only reason it hasn't been built to date is because it wasn't needed until now.

3. Groundwater Recharge – Another concern that the area residents have voiced is that the treated effluent from the RIBs will in some way contaminate the underlying aquifer and taint the water supply. This assertion is completely false. In fact, the disposal of treated effluent via spray irrigation and percolation (and stormwater too for that

matter) into the ground is the primary means by which the aquifers are recharged. This is the preferred means of disposal by the FDEP verses direct discharge into a surface water. The Water Management District, the State agency in charge of regulating potable water use throughout the State of Florida, also encourages the use of spray irrigation and percolation as a means to recharge the aquifer.

4. Flooding – By far the biggest concern voiced by residents of the William's Creek Estates area was the potential for this project to increase their existing flooding problems. Each resident complained that their property already floods repeatedly and that the historic April 2014 event nearly flooded their homes. It is important to note that the William's Creek flood plain is exactly that, a flood plain. A portion of each of the residential properties (including in some cases their developed back yards) lies within this flood plain, so they will flood regularly. The proposed location of the RIBs is on higher ground outside of the floodplain.

   This project includes the construction of two RIBs. RIBs are ponds, designed to percolate treated effluent through the bottom into the ground. Each pond is loaded continuously for seven days and then alternated, such that only one pond is loaded at a time. RIBs are designed such that they drain almost instantly. They act very similar to the sands on the beach, in that as soon as water covers the pond bottom it is instantly percolated into the ground. The ponds are excavated as deep as they are to be able to key the pond bottom and side slopes into the underlying highly permeable sands, not to facilitate storage.

   As part of the RIB permitting process, the FDEP required HNWS to have a Geotechnical Evaluation of the soils completed. The intent of this soil study was to confirm that the loading rate of the ponds would not detrimentally raise the groundwater elevation within the underlying soils. The allowable loading rate (255,000 gallons per day) is the volume of effluent that the soils could accept on a daily basis and still maintain the required instantaneous percolation. This Hydrogeologic study was completed in 2005 and presented as a MODFLOW (computer modeled) Mounding analysis. This study forms the basis of the RIB design, how and when they are to be loaded and the FDEP permit approval of such.

   The study indicates that some of the effluent may percolate through the pond bottom and travel laterally through the soil and discharge into Williams Creek. However, if we look at this more closely, we can conclude that the impact of the treated effluent on the

adjacent property will be infinitesimal. While 255,000 gallons per day sounds like a lot of water, it is a fraction of the base flow in William's Creek. To further clarify, the base flow in Williams Creek on a given day (based on the Environmental Assessment which notes that the channel is a minimum of 15 feet wide and 1 foot deep) equates to 35,547,586 gallons per day or 139 times more flow than the RIBs are permitted to discharge. To rephrase, the RIB contribution would equate to a rise in the water surface elevation of William's Creek of a little more than 1/16th of an inch at base flow. This assumes that the full 255,000 gallons per day flows to the creek, which it doesn't. In fact, as noted, only a fraction of the subsurface flow is to the east. At peak flow (and still assuming that the full 255,000 gallons flows only towards Williams Creek) when Williams Creek is flowing at bank full, this increase in the water surface will not even be measurable. Therefore, no discernable increase in flooding of adjacent properties will result from this project.

We appreciate the resident's concerns. However, the facts are that this project is safe for the environment and will not flood adjacent properties. The contentions on our part are backed by multiple studies, extensive science, and years of data on similar projects throughout the state. We hope that this information helps to alleviate any concerns that you or members of the Board may have.

Sincerely,

Paul Gardner
General Manager

Santa Rosa County
Development Services

Beckie Cato, AICP
Planning and Zoning Director

Santa Rosa County Public Service Complex
6051 Old Bagdad Highway, Suite 202 Milton, Florida 32583
www.santarosa.fl.gov
Office: (850) 981-7000

Rhonda C. Royals
Building Official

Conditional Use Application

*Application Instructions begin on Page 4

** For Official Use Only **			
Application No.	2016 -CU- 009	Date Received:	2/24/16
Review Fee:	$235.00 + $268.51	Receipt No.:	63
Zoning District:	A1	Conditional Use Request:	6.09.02.
FLUM Designation:	SFR		

± 38.4 VD#4

Property Owner

Property Owner Name: Holley-Navarre Water System, Inc.

Address: 8574 Turkey Bluff Road, Navarre, FL 32566

Phone: 850-939-2427 Fax: 850-939-9541

Email: (poc: Mr. Paul Gardner) pgardner@hnws-fl.com

Applicant

■ Check here and skip this section if the applicant is the Property Owner. Otherwise, complete this section and provide authorization from the Property Owner giving the Applicant the authority to pursue conditional use approvals.

Company: _____

Contact Name: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

Property Information

Parcel ID Number(s): ~~12~~ 19-2S-26-0000-00402-0000

-OR-

Street Address of property for which the Conditional Use is requested:

_____

Parcel Size (acres): +/- 38.4 acres

Conditional Use Request Please describe the requested conditional use. Attach a site plan showing the proposed development in as much detail as necessary to demonstrate that your request meets the criteria found in Section 6.09.02 (attached).

The current zoning is R-1; Part J., provides for conditional use for Public and Private Utilities and Public Facilities in zoning R-1. (see attached)

Conditional Use Criteria

I understand that all decisions made by the Zoning Board of Adjustments are subject to appeal and that their decision does not become effective until the appeal time has successfully passed. ☒ Yes ☐ No

I understand that approval by the Zoning Board of Adjustments does not authorize construction and/or land clearing to occur on this site and that additional approvals and Building Permits may be required. ☒ Yes ☐ No

I understand that determinations by the Zoning Board of Adjustments are valid for 36 months. ☒ Yes ☐ No

Please read the attached conditional use information pertaining to your request and describe how your request meets the pertinent criteria. Attach additional sheets if necessary. The proposed facilities will benefit the Holley-Navarre Water System franchise area. It will be used for the purpose of quickly infiltrating excess treated water produced by the existing treated waste water treatment plant. The site will not have any office facilities and traffic will be limited to operation personnel on an "as need basis" only. The facilities will include no pumps or machinery that would cause a noise nuisance for the surrounding areas.

Certification and Authorization

By my signature hereto, I do hereby certify that the information contained in this application and the required supplemental materials is true and correct, and understand that deliberate misrepresentation of such information will be grounds for denial or reversal of this application and/or revocation of any approval based upon this application. I do hereby authorize County staff to enter upon my property at any reasonable time for purposes of site inspection.

Mr. Paul Gardner
Applicant Name (Type or Print)

Applicant Signature

General Manager
Title (if applicable)

2-24-16
Date

6.09.01 **General Provisions Regulating Conditional Uses**: A conditional use shall be permitted by the Board of Adjustment (Zoning Review and Appeals Board) provided the Board finds that the use:

A. Is so designed, located and proposed to be operated so that the public health, safety, and welfare will be protected;

The proposed Rapid Infiltration Basins (RIBs) are designed to dispose of treated effluent from the existing Wastewater Treatment Plant (WWTP) by percolating it into the ground. The effluent that is pumped from the WWTP to the proposed RIBs is treated and disinfected and is the same effluent that is routinely sprayed on the golf course property every day. The effluent poses no health risk to the public. No bulk storage of any hazardous chemicals or materials is proposed as part of this project. The entire site shall be fenced for safety and security.

B. Will not unduly adversely affect other property in the impacted area which it is located;

There are no mechanical buildings or equipment proposed for this site, therefore no nuisance impacts from noise will be associated with this project. The treated effluent is just water and therefore has no odor. Due to the existing wetlands on the east side of the property, the project will be located with a natural wooded buffer between the RIBs and the residential properties to the east. The properties to the north, south and west are presently undeveloped. Some natural wooded buffer is anticipated to remain to the north and south as well.

C. Conforms to all applicable provisions of the district in which the use is to be located;

The subject property is zoned R-1. The proposed project will be a Public Utility facility which is allowed in the R-1 zoning as a conditional use. Therefore, we believe that this project does conform.

D. Satisfies criteria stipulated for similar uses as described in the following section.

See below.

6.09.02 **Criteria Regulating Conditional Uses:**

1. Location of such facility shall be situated on a site providing the most effective service to such area. The applicant shall demonstrate that such proposed sites are located effectively relative to the service area and that the site proposed is at least equal to the effectiveness of other alternative sites.

As noted previously, Rapid Infiltration Basins are percolation ponds. In order for them to work efficiently they must be located in highly permeable soils and on a large enough piece of property to provide a meaningful amount of disposal. They also need to be located close to the source of the treated effluent to minimize pumping costs and required piping infrastructure. To this end, the proposed site was selected because it meets this criteria. Other properties in the area were evaluated as potential sites but none were either available or within budget.

2. The location of such facility shall not unreasonably increase traffic on streets in the impacted area.

The facility will be generally monitored remotely and will not be permanently staffed. A single 30 minute visit per day is all that is anticipated for preventative maintenance.

3. The scale, intensity and operation of the use shall not generate unreasonable noise, traffic, congestion or other nuisances or hazards to contiguous residential properties.

There are no proposed mechanical facilities which would cause potential noise. The excess treated water consists of the same re-use water provided to the Holley by the Sea entrance ponds and for irrigation at Hidden Creek Golf Course.

4. General office facilities of a utility shall be located in commercial districts.

There will be no offices in the proposed facilities and no permanent staffing.

5. County facilities shall be allowed in any district.

Not applicable as this project is not a County Facility. However, it should be noted that the proposed facility will provide a direct service to the local public utility.

6. There shall be no time limit placed upon the approval of the Board of Adjustments for public and private utilities.

It is respectfully requested that this request be approved in a reasonable time period to provide the needed additional services to the local utility; so that, the current and future local customers receive the best service as possible.

7. No height variance is required for a conditional use approval for a water tower.

The proposed pond embankments will be kept at a minimum or at ground level.

Leslie Statler

From: Dale Long <dlong@mesi-fl.com>
Sent: Monday, March 28, 2016 8:37 AM
To: Leslie Statler
Cc: Paul Gardner
Subject: RE: Conditional Use Application

Hi Leslie,

The easement is through Lot 11. We also have an easement to the north of the property (I forgot to mention this one previously) through 18-2S-26-0000-00400-0000. I have put my eyes on the easement from the north, but I am still looking for the executed easement through lot 11 William's Creek.

Both of these access points would require wetland permitting, hence the reason we are pursuing an easement from the south.

Please call with questions.

Dale

From: Leslie Statler [mailto:Leslies@santarosa.fl.gov]
Sent: Thursday, March 24, 2016 3:00 PM
To: 'Dale Long' <dlong@mesi-fl.com>; 'Mike Dorman' <mdorman@mesi-fl.com>
Cc: LeAnne Hair <LeAnneH@santarosa.fl.gov>
Subject: RE: Conditional Use Application

Thank you. Where's the easement along Williams Creek Drive? I'm trying to identify a location for the agenda.

Leslie

Ms. Leslie Statler
Planner III
SRC Development Services
850.981.7086 (ph)
850.623.1381 (fax)

From: Dale Long [mailto:dlong@mesi-fl.com]
Sent: Thursday, March 24, 2016 2:50 PM
To: Leslie Statler <Leslies@santarosa.fl.gov>; 'Mike Dorman' <mdorman@mesi-fl.com>
Cc: LeAnne Hair <LeAnneH@santarosa.fl.gov>
Subject: RE: Conditional Use Application

Hi Leslie,

We have an easement from William's Creek Drive for access, however, in an effort to avoid some potential permitting snags, we are presently negotiating with the adjacent property owner to gain access from Hwy 98.

Dale

From: Leslie Statler [mailto:Leslies@santarosa.fl.gov]
Sent: Thursday, March 24, 2016 1:35 PM
To: 'Mike Dorman' <mdorman@mesi-fl.com>
Cc: dlong@mesi-fl.com; LeAnne Hair <LeAnneH@santarosa.fl.gov>
Subject: RE: Conditional Use Application

Hey Mike! I'm getting into the applications and had a question about access – where is the access for this site?

Thanks!

Leslie

Ms. Leslie Statler
Planner III
SRC Development Services
850.981.7086 (ph)
850.623.1381 (fax)

From: Mike Dorman [mailto:mdorman@mesi-fl.com]
Sent: Thursday, February 25, 2016 7:10 AM
To: Leslie Statler <Leslies@santarosa.fl.gov>
Cc: dlong@mesi-fl.com; LeAnne Hair <LeAnneH@santarosa.fl.gov>
Subject: RE: Conditional Use Application

Leslie,

Thank you for speaking with me yesterday. I have attached the exhibit pdf's which I included in the application. If there is any additional information needed please give me a call or send me an email and I will get it to you ASAP. Also, there is a Pre-Application meeting with regard to this project next Wednesday, March 2nd, if you have any questions or comments regarding this application we would be more than happy to answer them.

Thank you for your time with this project.

Sincerely,

E. Michael Dorman
Civil Engineering Technician

Municipal Engineering Services, Inc.
8574 Turkey Bluff Road

Navarre, FL 32566
850.939.5732
mdorman@mesi-fl.com

From: Leslie Statler [mailto:Leslies@santarosa.fl.gov]
Sent: Wednesday, February 24, 2016 4:34 PM
To: 'Mike Dorman' <mdorman@mesi-fl.com>
Cc: LeAnne Hair <LeAnneH@santarosa.fl.gov>
Subject: Conditional Use Application

Mike –

Thank you for bringing in the Conditional Use application for the proposed RIBs. Your request will be considered during the April meeting cycle: April 14, 2016 = Zoning Board RECOMMENDATION; and April 28, 2016 = Board of County Commissioners FINAL DETERMINATION.

As discussed, if you send a pdf of the site plan, I would be very appreciative.

Thanks!

Leslie

Ms. Leslie Statler
Planner III
Santa Rosa County Development Services
850.981.7086 (ph)
850.623.1381 (fax)

leslies@santarosa.fl.gov

How is our customer service?
http://www.santarosa.fl.gov/customerservice/survey.html

Please note: Florida has a very broad public records law. Most written communications to or from state officials regarding state business are public records; available to the public and media upon request. Your e-mail communications to or from Santa Rosa County employees may be subject to public disclosure. (Florida Statute, Chapter 119)

Florida has a very broad public records law. Under Florida law, both the content of emails and email addresses are public records. If you do not want the content of your email or your email address released in response to a public records request, do not send electronic mail to this entity. Instead, contact this office by phone or in person.

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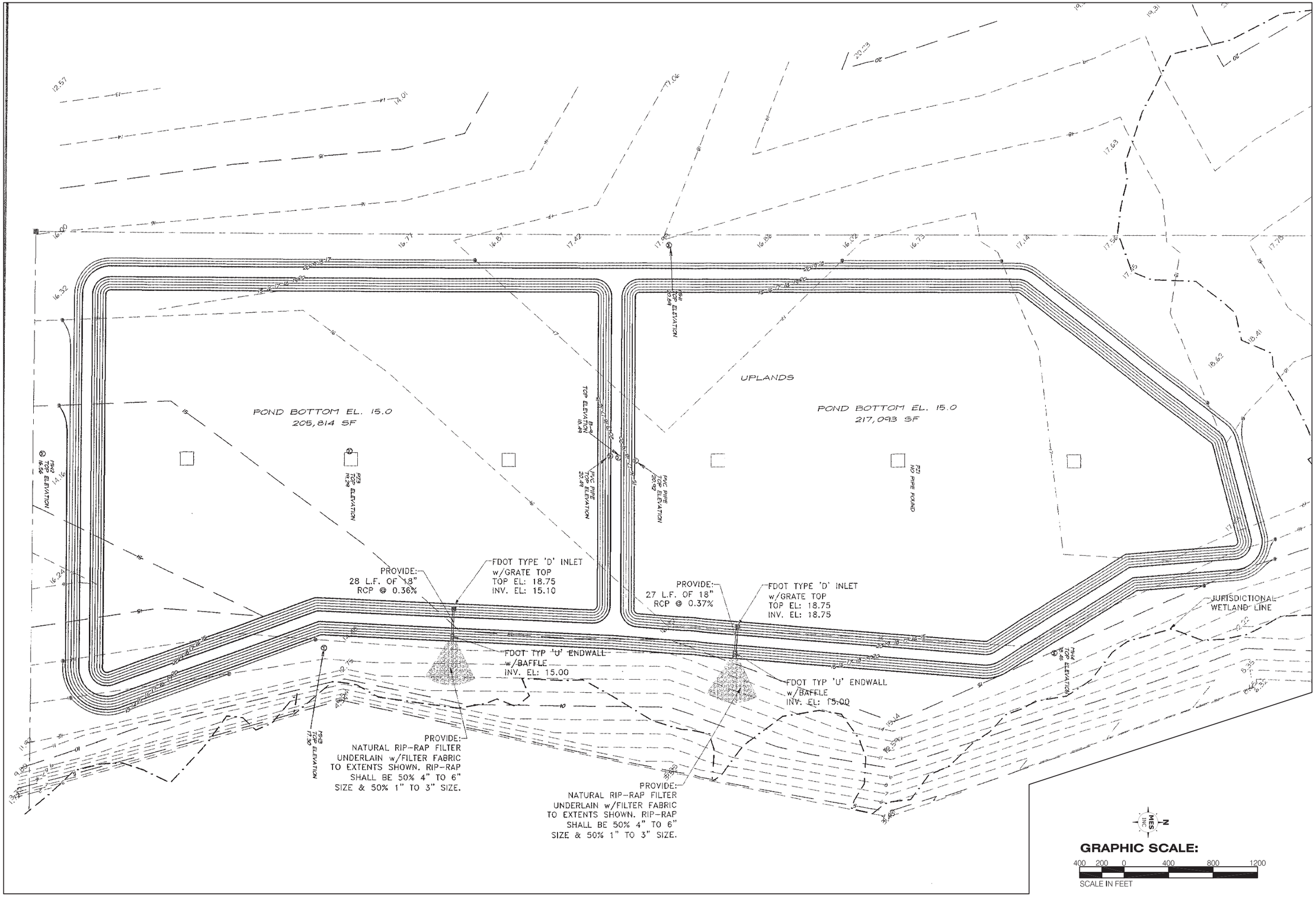

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Citizen Comments

2016-CU-009

Received AT the

Zoning Board meeting

Leslie Statler

From: Nancy Sandler <nasandler@bellsouth.net>
Sent: Tuesday, April 12, 2016 5:58 PM
To: Leslie Statler
Subject: Conditional Use 2016-CU-009 Holley-Navarre Water System

Unfortunately I am unable to attend the meeting in Milton at 6 pm on April 14.

I read the letter I received and I read the complete request online.

My concerns are that this is about water. My understanding is that Holley Navarre Water wants to bring treated waste water into our area with the hope that it will soak into ground already saturated with water. I live at the South End of Williams Creek Drive and I envision that when it rains this water could combine with the other water that runs down Williams Creek Drive and into my yard.

This is a flood zone and the County has already allowed projects that have increased the probability of flooding.

The County allowed a third school to be built in our area, without sufficient drainage, and when it rains, a river of water runs down from the area of the three schools into Williams Creek Drive.

The County installed drainage ditches that incline up toward Highway 98 and so they do not drain. They are huge concrete culverts that always have standing water and algae and are ripe for mosquito breeding. When our grand kids visit, they look at it and call it a swamp.

Two years ago when DOT was working on Highway 98, they blocked drainage from Williams Creek Drive. We notified the County regarding this and nothing was done. When there was heavy rain, our house flooded for the first time since it was built.

This is a residential area and it cannot be healthy for our neighborhood, our families, our pets, or the natural surroundings to have affluent water soaking into the ground.

These are the reasons any discussion of bringing more water to this area concern me and I am opposed to this project.

Nancy Sandler
1905 Williams Creek Drive

Chad and Chastity Reuschle
1917 Williams Creek Drive
Navarre, Florida 32566
850-240-3115
creuschle@yahoo.com

April 14, 2016

Santa Rosa County Development Services
Inspections / Compliance Division
Planning / Zoning Division
LeslieS@santarosa.fl.gov

Re: Conditional Use 2016-CU-009 Holley-Navarre Water System, Inc.
Represented by Paul Gardner

To Whom It May Concern:

Our family has lived in Navarre for the past 10 years. We have traveled the world through military transfers and chose to retire and settle in this friendly beach town. We have the best beach as well as wooded areas for 4 wheeling and wildlife observation. We have found this area so fantastic, that we have even had some family and friends move to Navarre. We love it here.

It has come to our attention that the proposed rezoning plan for the property on the 7900 block of Williams Creek Drive will greatly affect the other properties that are adjacent to Williams Creek. It is our understanding that the RIB (Rapid Infiltration Basin) is intended to reduce the flooding / flood risks to the residents of Holley by the Sea. This, however, should not be at the cost of the Williams Creek neighborhood. The RIB would *"allow for rapid infiltration of excess treated waste water"*. Our concerns are as follows:

- Treated water would adversely affect the wildlife in the area. We have Heron's that repeatedly nest in the pine trees along Williams Creek. The food that they hunt would be poisoned due to the chemicals found in the waste water.
- The chance of the treated water killing off the sea grass is concerning as well. This would be a detriment to an ecosystem that is already suffering. This could possibly affect the sport fishing in the sound. They just installed a kayak launch a few hundred yards from the entrance to Williams Creek.
- Our neighborhood is already at an increased risk for floods. Our backyards are already saturated and swampy. As per the information provided to our neighborhood by Bill Evans, contact for Northwest Florida Division of Industrial Wastewater Permitting – this proposal would exacerbate the poor drainage situation by increasing the ground water level.
- As you can see from the photos provided, the last flooding to the area caused the creek water to come within an inch of entering our home. The photos show the waterline at approximately 5 feet high on our fencing and approx. 2 feet high on our house.

We fill that our neighborhood has valid arguments with the submitted proposal. Thank you for your time and attention to our concerns. We hope that you will vote against the proposed RBI to the 7900 block of Williams Creek Drive.

Sincerely,

Chad P. Reuschle

Chastity K. Reuschle

4/11/2016

Harry Robert and Kelli Swim
Residents of Navarre, Santa Rosa County
1921 Williams Creek Drive

To Whom It May Concern:

We are writing to you in reference to the request for Holley Navarre Water to obtain a permit for an RIB system to be located behind our property. If you are unfamiliar with an RIB system, it is a rapid infiltration system of excess treated WASTE WATER. We strenuously oppose the project as it will directly affect our property in a multitude of ways.

Firstly, our home is one of five homes that backs up to Williams Creek. This is an area which is extensively affected by the smallest amount of rainfall, much less any large accumulation from any source (rainfall, the creek rising, hurricanes, etc.) We stay saturated, even when there is no rainfall for weeks. Before this week's rain, our area has been dry and free from rain for some time, yet our backyard is wet and swampy. So much that we cannot walk our dog on the lower part of our own yard. With the storm in 2014, the waters rose about 10 feet from the creek, flooding the entirety of our wetlands and our backyard. I have provided pictures for you today to show you the amount of damage we incurred. The waters were on our porch and inches from getting in our house. This was not even considered a disaster, but for us it could have been. It is my understanding after speaking with Bill Evans, the state's wastewater project manager, that there will be an increase in the amount of water that will be saturated into the ground as well as in

Williams Creek. He told us the impact of the system is unknown and hard to predict. We simply cannot handle any additional water. The "everyday" waters are something we deal with on a daily basis. The wetlands behind our properties are considered flood areas. Although our property is not on a flood plain, and we are not required to purchase flood insurance, we opted to do so after the 2014 rains that threatened us, as well as our home. The water was so high, when evacuation was looking inevitable, we could not have walked, a kayak was going to be our form of transportation. If you can imagine, two adults, a child and a dog two days out of surgery who was immobile, planning how to evacuate their home because of flood waters directly from the creek. When our children cannot play in the backyard, we cannot walk our dog in certain areas, we are forced to take down a tree in our own backyard because the wet grounds has caused it to tip over.....to say additional accumulation of waters would be detrimental would be an understatement.

It is our understanding that Holley Navarre Water is proposing this plan to help take some of the pressure off of Holley By the Sea residents. We are shocked to think the county would be willing to sacrifice our area of Navarre to help another area of the same town. Yes, we are a smaller area...but we should not be considered less important.

Next, we are unsatisfied with the explanation given to us regarding the condition of the water. Not only will we be dealing with additional water, but then we must be concerned with our health. Again, we were assured the water would be highly treated with chemicals to reduce the risk of impact. Highly treated with chemicals! The use of chemicals does not make us feel any better, in fact..it makes us even more leery. We were told it is done all the time to help irrigate golf

courses, grounds, etc. in our area (Holley By the Sea was mentioned specifically.)
We do not want any additional water or **any** chemically treated water entering our properties. The chemicals used will seep into the ground and the runoff will go directly to Williams Creek. We have not even discussed the impact it could have on our wetlands and the wildlife in it.
As you must be well aware, our wetlands contain some of the most beautiful marine life, including mammals, reptiles, birds, and residents that swim in the sound! Our creek runs directly into the sound. Need I say more?

We understand the need for projects to improve our county, but this is one that will negatively affect residents living in your county. How can you allow us to be sacrificed?

We hope you will consider the information we've provided and deny this permit, putting a halt to the proposed project.

Respectfully yours,

Harry and Kelli Swim

Residents of Navarre, Santa Rosa County

Santa Rosa County Development Services

I am not in favor of the Conditional Use 2016-CU-009.

My concerns that this area floods quite easily already. The drainage ditches that were built go uphill and are not clean out. When we have rain storms the water backs up into the streets, yards and drive ways. Any additional water will cause more flooding.

My other concern is the treated waste water. This water is not clean. What impact will this have on the creek, wild life and surrounding neighborhoods?

Thank you,

Angela K. Couch
1913 Williams Creek Dr.
Navarre, FL 32566

Nancy Sandler
1905 Williams Creek Drive

Unfortunately I am unable to attend the meeting in Milton at 6 pm on April 14.

I read the letter I received and I read the complete request online.

My concerns are that this is about water. My understanding is that Holley Navarre Water wants to bring treated waste water into our area with the hope that it will soak into ground already saturated with water. I live at the South End of Williams Creek Drive and I envision that when it rains this water could combine with the other water that runs down Williams Creek Drive and into my yard.

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The County allowed a third school to be built in our area, without sufficient drainage, and when it rains, a river of water runs down from the area of the three schools into Williams Creek Drive.

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Two years ago when DOT was working on Highway 98, they blocked drainage from Williams Creek Drive. We notified the County regarding this and nothing was done. When there was heavy rain, our house flooded for the first time since it was built.

This is a residential area and it cannot be healthy for our neighborhood, our families, our pets, or the natural surroundings to have affluent water soaking into the ground.

These are the reasons any discussion of bringing more water to this area concern me and I am opposed to this project.

Nancy Sandler
1905 Williams Creek Drive

Subject: Fwd: My letter

From: C M (gambleconnie@yahoo.com)

To: danigraczyk@yahoo.com;

Date: Thursday, April 14, 2016 8:13 AM

10 copies of my letter

Sent from my iPhone

Begin forwarded message:

From: C M <gambleconnie@yahoo.com>
Date: April 14, 2016 at 8:17:16 AM CDT
To: "Kelli Swim (next Door)" <kelli26@bellsouth.net>
Subject: My letter

My name is Connie Gamble. Address is 1925 Williams Creek Dr. Navarre, Fl.

In the past, Williams Creek Subdivision has been compromised. Decisions to give permits to build Holley Navarre Primary school and a road for school buses, without a feasibility study created a flood problem. I didn't see the feasibility report, but I' d like to think our county officials wouldn't throw us under the bus. I'm sure the county councilmen, developers and builders never considered that the fill dirt needed to build the school, and the road would create a water run off problem effecting Williams Creek Subdivision. When it rains the road becomes a river emptying into our subdivision.

In 2014, our area received a tremendous amount of rainfall. Williams Creek water level rose quickly. Water reached the back of our houses in no time. The homes on the south end of Williams Creek road was inundated via the water run off from the school bus road. Williams Creek flooded and entered the back of their homes. The north end of Williams Creek road in front of Holley Navarre Intermediate school was flooded from the creek with about 3 feet of water.

The risk is too high to allow a RIBS facility to adjoin or be near Williams Creek.

The Santarosa.fl.gov/developmentservices/comprehensionplan addresses levels of impaired waters that have fecal cloriform bacteria. They are: Blackwater river, East Bay river, Escambia river and Pace Mill Creek. The report also includes a diagram that shows our area, South Santa Rosa county lies in a storm water problem area. Also, our area falls in an area of high vulnerability for contamination intrusion into our water acquifiers. Santa Rosa sound has been closed because the fecal cloriform bacteria was high.

The Clean Water Network of Florida in "2008 published a report "The Gulf of Mexico-Florida's Toilet
(See attachment)
Sprayfields often create additional problems. Like other forms of disposal, low treatment standards (secondary treatment and basic disinfection, pH control) and system malfunctions in combination create a threat to water quality. We found many violations of standards, such as spills, violations of BOD, coliform and phosphorus (City of Lynn Haven). The City of Crestview sprayfield had numerous spills and leaks into Juniper Creek, TSS and fecal coliform violations. Spills and numerous nitrogen, phosphorus and other violations were found at the South Santa Rosa Utilities sprayfields.
But even if there were no violations, land applications for disposal or irrigation uses of reclaimed water, when using water treated only to the secondary level, may involve water containing a host of pathogens, nutrients, and toxins that survive the secondary process (EPA 2008, Rose 2004).

The Clean Network of Florida address Underground Injection and RIBs. They write, Like spray irrigation, the lower standards required for these methods of underground disposal are driving an increase of their use, causing major problems for the quality of groundwater and springs. Studies have shown that large nitrogen loadings from these wastewater facilities are a major source of elevated nitrates in some of Florida's springs (Evans 2004). Groundwater migrates, often mixing with surface waters, so those water bodies are also affected. The same pathogen, nutrient, and toxin issues that exist with sprayfields and water reuse irrigation apply, if the wastewater disposed of is treated only to the secondary level. The injection well in Punta Gorda is causing nitrogen loading to the groundwater. The combined UIC and land application at Rotunda West in Charlotte County has two consent orders for disinfection, pH, fecal coliform, pond overflows and other violations.

This report supports that both spraying, underground injection and RIBS system create problems to ground water, streams and the Gulf.

Another reports supports contamination in the Gulf.
http://oceanservice.noaa.gov/hazards/hypoxia/
The Gulf of Mexico's -- "The Dead Zone" report came out in June 2015. There are 6,474 square miles of dead zone due to contamination from agricultural nutrient runoff, river discharge to include nitrogen overload. RIBS can contribute to nitrogen overload.
Permitting a RIBS facility in a high probability area of intrusion to acquifiers would be a mistake and could open the door to lawsuits especially when we're quite aware of the high probability of contaminating our acquifiers and water supplies

There are over 200 wastewater reclamation facilities in Florida. It's very clear and evident in the Clean Network of Florida report that spray water and RIBS contaminate our water supply and environment. These systems have been around for awhile and the still cause contamination to our environment.

FACTS:
1. Williams Creek subdivision floods from permitted development of Holley Primary Scool and the school bus road.
2. Williams Creek is in a Flood Plain and floods

3. RIBS will only add to increased waters in Williams Creek therefore causing more severe flooding to our homes.
4. RIBS probability of breakdowns and failures are high.
5. Breakdown and failures will cause
   a) mosquito infestation
   b) contamination of wetlands
   c) contamination of Williams Creek
   d) contamination of water into the Intercoastal and eventually the Gulf adding to "The Dead Zone"
   e) RIBS contamination can enter a already high vulnerable water acquifier, contaminating water
   f) spray water may involve water containing a host of pathogens, nutrients and toxins that survive the secondary process creating contamination.

All of you have a tough job because your decisions and approval on permits have positive or negative affects on this community and in our environment

There are major problems with our water, waste management, and the contamination of our environment. It's up to you, our county councilmen to stop entertaining old ways and systems. The growth of our community tells us that we have to change and be in the forefront with new innovative green ways. We don't need to continue to entertain systems we know have problems and have failed. When we accept these ideas were playing Russian roulette. Someone needs to step up to the plate and foster a plan where new, innovative good clean green ways will be looked out and permitted. We need to be key players in stepping outside the box and change what the future is. I have faith in you, our county councilmen and women, it starts with all of you to have courage to change and step outside the box. We have an obligation to protect our environment and be in the forefront to research and develop a facility like the Omega Center for Sustainable Living(OCSL), also known as the Eco Machine. in Rhineback, New York.

The moral and ethical thing to do is to start the ball rolling and and reject the permit for the RIBS system.

Thank you
Connie Gamble

Sent from my iPhone

4.0 Introduction to the Infrastructure Supporting Documentation

The Infrastructure Element consists of policies related to sanitary sewer, solid waste, drainage, potable water, and natural groundwater aquifer recharge. The element addresses coordinating the extension of, or increase in the capacity of, facilities to meet future needs while maximizing the use of existing facilities and discouraging urban sprawl; conserving potable water resources; and protecting the functions of natural groundwater recharge areas and natural drainage features. This section of the Support Documentation contains the data and analyses required - including a description of problems and needs and the general facilities that will be required for solution of the problems and needs.

Planning Area Framework

In order to provide an analysis of the County's Future Land Use and Existing Land Use Maps as well as the policies contained within the Comprehensive Plan, the County has been divided into six separate and distinct planning areas (Reference **Map 2-1** of the Future Land Use Element Supporting Documentation). These planning areas have been developed considering the availability of centralized water and sewer services, particularly the franchise areas for the existing water and sewer providers within the County. Along these lines, this planning area framework is depicted on all of the maps included in this section for analysis purposes.

4.1 Wastewater Infrastructure

Wastewater disposal is an important consideration in the planning process. As population increases, the need for additional central sewer capacities increases, particularly in areas not suitable for septic tanks, for non-residential projects or for residential projects desiring greater densities. Wastewater includes water from the kitchen and bathroom sinks, toilets, dishwashers, clothes washers, and bathtubs and showers. Each day, every person within Santa Rosa County produces an average of approximately 90 gallons of wastewater. The final destination may be either an on-site treatment disposal system (usually a septic tank) or a regional treatment plant, which may be located many miles from the structure where wastewater is generated.

4.1.1 Septic Tank Systems

Septic tank or onsite sewage disposal systems are generally small and designed to serve one or a limited number of land uses. Despite expansion of the wastewater collection network, many residents within the unincorporated portion of the County do not have access to wastewater treatment facilities or package treatment plants. For these land uses, wastewater treatment and disposal is provided by individual septic systems. Septic tank systems provide on-site wastewater treatment for both residential and small-scale commercial developments. Residential septic tanks usually range in capacity from 900 to 1,000 gallons. Generally, commercial septic tanks have a larger capacity.

Septic tanks are a potentially important source of fecal coliform pollution in urban watersheds. When properly installed, most of the coliform from septic tanks should be removed within 50 meters of the drainage field (Minnesota Pollution Control Agency 1999). However, the physical properties of an aquifer, such as thickness, sediment type (sand, silt, and clay), and location play a large part in determining whether contaminants from the land surface will reach the ground water (USGS 2010). The risk of contamination is greater for unconfined (water table) aquifers than for confined aquifers because they

4.3 Stormwater

The purpose of this section is to describe the existing stormwater systems and drainage problems and to set forth the basic policies to ensure that the County will be able to meet the existing and anticipated stormwater management needs. The analysis of the existing conditions and future needs serves as a basis for formulating suitable recommendations concerning the Stormwater Management needs in addition to formulating the Goals, Objectives, and Policies (GOP's).

4.3.1 Existing Systems and Watersheds

4.3.1.1. The Pensacola Bay System

The Pensacola Bay system (also, PBS or "system") includes five interconnected estuarine embayments, including Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and Santa Rosa Sound, and three major river systems: the Escambia, Blackwater, and Yellow rivers. The system also includes smaller tributaries of these embayments and rivers, as well as its entire watershed. The watershed covers nearly 7,000 square miles, about one-third of which is in Florida. This includes the majority of Escambia, Santa Rosa and Okaloosa counties, the northwest quadrant of Walton County, and a substantial portion of southern Alabama. The entire system discharges into the Gulf of Mexico, primarily through a narrow pass at the mouth of Pensacola Bay. Map XXX in the Conservation Element illustrates the bay system as a whole.

4.3.1.2. The Blackwater River Watershed

The Blackwater River watershed is one of the last remaining shifting white sand bottom river systems in its natural state in the world. With sections of the river designated as an Outstanding Florida Water (O.F.W.) and as a Florida Canoe Trail, the Blackwater River watershed provides an opportunity to protect a valuable natural resource for the benefit of society and ecology alike. The Blackwater River watershed is located in the southeastern United States, with its geographic boundaries crossing two states and four counties. The watershed encompasses parts of Alabama's south central region and Florida's northwestern panhandle and is encompassed by the larger Pensacola Bay watershed. The headwaters of the watershed are located in Alabama's Escambia and Covington counties, however the majority of it's approximate 719 square mile area occupies Florida's Santa Rosa and Okaloosa counties (F.G.D.L. 2009). Map XXX in the Conservation Element illustrates the watershed as a whole.

4.3.2 Stormwater Management in General

Climate, soils, geology, topography, vegetative cover and land use all have an effect on stormwater runoff and drainage. Land use impacts the natural hydrology in four interrelated, but separable ways as stated further below:

1. changes in peak flow,
2. changes in total runoff,
3. changes in water quality, and
4. changes in hydrologic amenities or the appearance of a river, stream or bay.

Land use urbanization has the most significant impact affecting the hydrology of an area. The majority of pollution problems arise from the associated land uses such as residential, commercial, industrial and agricultural.

In undeveloped areas, stormwater runoff is managed by nature through the hydrologic cycle. As rainfall accommodates on the ground or in standing water bodies, the water either returns to the atmosphere through evaporation or it can percolate into the ground to be assimilated by trees and vegetation, eventually to be returned to the atmosphere by transpiration. Percolation water that is not used by vegetation is percolated deep into soils increasing groundwater supply. In the presence of saturated ground conditions the remainder of rainfall collects into rivulets, increasing the speed and quantity as it flows to the receiving body of water. Then the cycle begins again through evaporation.

Nature's inability to accommodate severe rainfalls without damage is apparent even in undeveloped areas. Nature's stormwater management designs are constantly changing. Streams change course and meander, banks erode, and lakes lose volume as they are filled with sediment.

Historically, urbanization has resulted in new or highly modified drainage systems which dealt with only the quantitative effects of runoff. Today, stormwater management is more comprehensive. An effective program involves the development of methods to control water while providing surface drainage, flood control, a reduction in erosion and sedimentation and a reduction in pollutants. Stormwater management applies to both rural and urban areas.

To accomplish an effective stormwater management system, it is necessary to ensure that volume, rate, timing and pollutant load runoff is similar to what occurred before development. The approach used in this comprehensive plan is to minimize the adverse impacts through a coordinated system of source controls. Source controls emphasize the prevention and reduction of non-point source pollution and excess stormwater flow before it reaches a collection system or receiving water.

4.3.3 Stormwater Management Problems in Santa Rosa County

Stormwater management practices within Santa Rosa County must deal with two problems. The first problem is drainage and flooding. The second problem is the water quality of the stormwater runoff. Recent studies conducted nationwide have indicated that environmental impacts are caused by pollutants carried in stormwater. These pollutants include bacteria, fertilizers, heavy metals, and pesticides as indicated in previous sections of this sub-element. Stormwater management must provide provisions to settle or filter out these pollutants in order to preserve the quality of the groundwater and surface water into which the stormwater is to be discharged. Chapter 62-25, F.A.C., provides the guidelines that are relevant to stormwater management facilities and the practices that are to be employed to help ensure adequate treatment and protection to protect the citizens within the County.

4.3.3.1 Flooding Problems

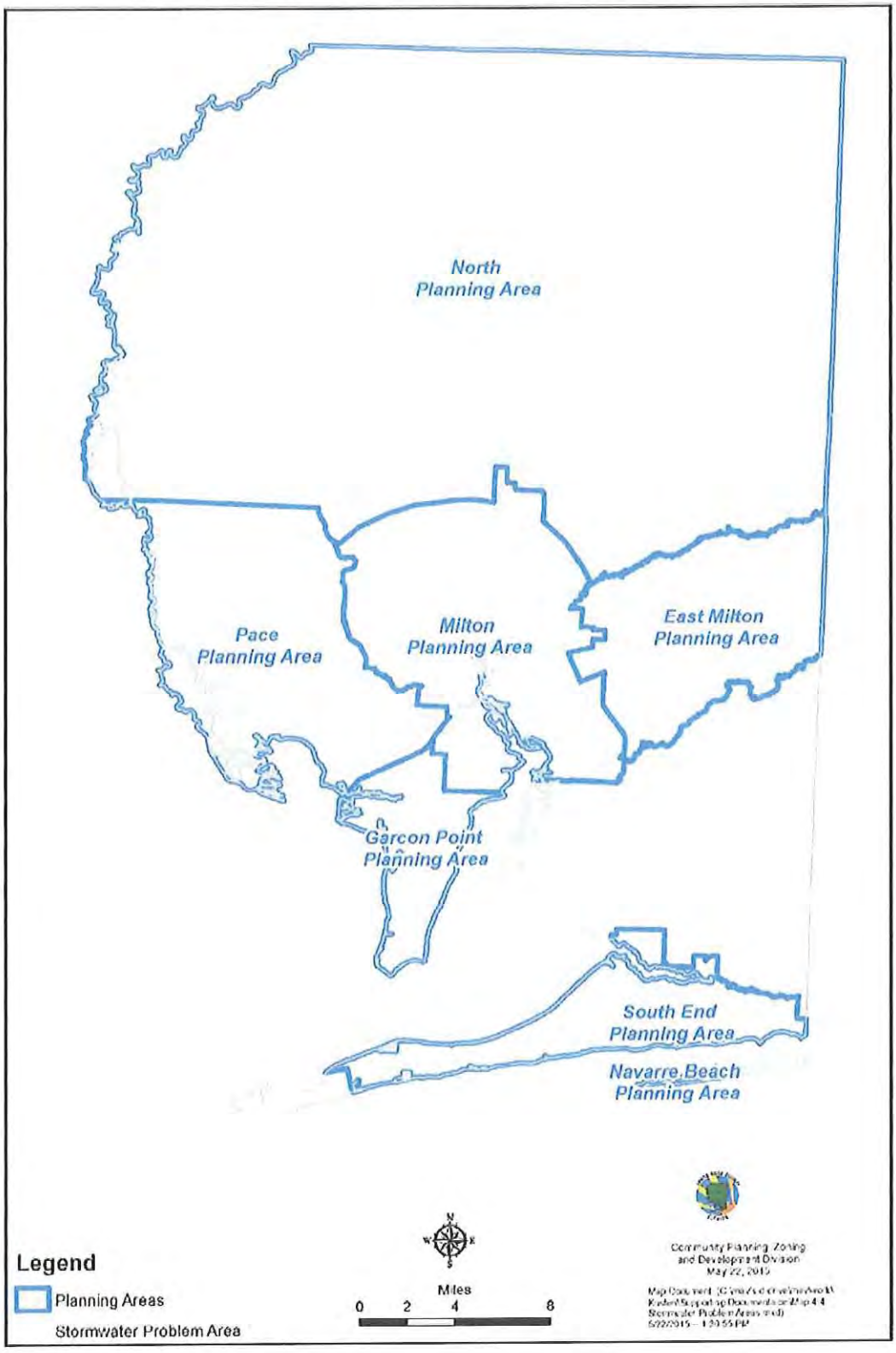
The major sources of flooding within Santa Rosa County are storm surge generated by a tropical storm or hurricane and riverine flooding. Storm surge can be expected along the Gulf of Mexico, Santa Rosa Sound, Escambia Bay, East Bay and Blackwater Bay. The wave action associated with the storm surge can be more damaging than the actual high water. The second major source of flooding is riverine flooding where heavy rainfall occurs on many water courses including the Escambia River, Blackwater River, Yellow

River, East River, Pond Creek, Big Juniper Creek, Sweetwater Creek, Big Coldwater Creek and East Fork. Not all storms passing close to the County produce high storm surge or flooding conditions. Similarly, storms that produce flooding in one area of the County may not necessarily flood another part of the County. Presently, the County's drainage problems fall into six categories:

1. Traffic hazards from standing water,
2. Damaging sheet flow on and off of rural roads,
3. Potential flooding associated with hurricanes and other above average storms damaging structures,
4. Long term water quality problems due to runoff;
5. Failure of on-site sewage disposal systems and damage to other infrastructure caused by flooding.

The current Santa Rosa County Land Development Code contains provisions related to identified Stormwater Problem Areas **(Map 4-4)**. These areas include the Special Flood Hazard Areas of the County as well as additional areas that have been identified by the County as areas experiencing frequent flooding. Special considerations are required when developing within one of these designated areas. In addition, the County has developed a Local Mitigation Strategy (LMS) that is incorporated herein by reference. Additional information on this document is found within the Coastal Management Element Supporting Documentation.

Map 4-4 Stormwater Problem Areas of Santa Rosa County



4.3.3.2 Water Quality

Different types of land use affect the water quality in an area. For example, in an undeveloped area, many biological, physical and chemical processes interact to recycle most of the materials that are found in stormwater runoff. As land use in these areas intensifies, this process is disrupted. Increased activities add materials to the land surface such as fertilizers, pesticides, oils, grease, heavy metals and animal wastes, which are then washed off by the rainfall and runoff. In turn, this runoff then increases the pollutant loading which is carried to a nearby surface water body.

Water Body Classifications and Water Quality Monitoring

Surface water bodies are classified by the Florida Department of Environmental Protection (DEP) based upon the intended uses of these bodies. All waters of the state fall into one of five surface water classifications (62-302.400 F.A.C.) with specific criteria applicable to each class of water. In addition to its surface water classification, a water may be designated as an Outstanding Florida Water, (62-302.700 F.A.C.). An Outstanding Florida Water, (OFW), is a water designated worthy of special protection because of its natural attributes. This special designation is applied to certain waters, and is intended to protect existing good water quality. Most OFWs are areas managed by the state or federal government as parks, including wildlife refuges, preserves, marine sanctuaries, estuarine research reserves, certain waters within state or national forests, scenic and wild rivers, or aquatic preserves. Generally, the waters within these managed areas are OFWs because the managing agency has requested this special protection. In Santa Rosa County portions of the Blackwater River are designated as an OWF.

The DEP undertakes water quality assessments of water bodies in response to Section 305 (b) of the Federal Clean Water Act. There are nine DEP water quality monitoring sites within Santa Rosa County monitored on a weekly basis along with some nearby Santa Rosa Island water quality stations monitored by the Escambia County Health Department under the auspices of the Florida Healthy Beaches Program that was established in August 2000.

Total Maximum Daily Loads (TMDLs) in Santa Rosa County

The Pensacola Bay Watershed and the Blackwater Watershed have both been designated as Priority Watersheds by the U.S. Environmental Protection Agency (EPA). Priority watersheds are those where the US EPA Region 4 and State of Florida agency partners have agreed to focus mutual resources to protect and restore waters.

A TMDL is a scientific determination of the maximum amount of a given pollutant that a surface water can absorb and still meet the water quality standards that protect human health and aquatic life. Water bodies that do not meet water quality standards are identified as "impaired" for the particular pollutants of concern--nutrients, bacteria, mercury, etc.--and TMDLs must be developed, adopted and implemented for those pollutants to reduce pollutants and clean up the water body. The threshold limits on pollutants in surface waters--Florida's surface water quality standards on which TMDLs are based--are set forth primarily in rule 62-302, Florida Administrative Code, and the associated table of water quality criteria.

What are the basic steps in the TMDL program are as follows:

1. Assess the quality of surface waters--are they meeting water quality standards? (Surface Water Quality Standards - Chapter 62-302, F.A.C.)
2. Determine which waters are impaired--that is, which ones are not meeting water quality standards for a particular pollutant or pollutants. (Impaired Waters Rule (IWR) - Chapter 62-303, F.A.C.)
3. Establish and adopt, by rule, a TMDL for each impaired water for the pollutants of concern--the ones causing the water quality problems. (TMDLs - Chapter 62-304, F.A.C.)
4. Develop, with extensive local stakeholder input, Basin Management Action Plans (BMAPs) that....
5. Implement the strategies and actions in the BMAP.
6. Measure the effectiveness of the BMAP, both continuously at the local level and through a formal re-evaluation every five years.
7. Adapt--change the plan and change the actions if things aren't working.
8. Reassess the quality of surface waters continuously.

The following describes the status of the TMDL process in Santa Rosa County. To date, four final TMDLs have been adopted that affect the County: Blackwater River, East Bay River, Pace Mill Creek and Escambia River. These final TMDL documents are incorporated herein by reference. In addition, TMDLs are pending for all of the verified impaired water bodies shown on the following map (**Map 4-5**). No Basin Management Action Plans have currently been completed for Santa Rosa County.

Blackwater River (FDEP Final TMDL)

A Total Maximum Daily Load (TMDL) for fecal coliform bacteria for the Blackwater River (tidal) has been established. This waterbody was verified as impaired for fecal coliform, and therefore was included on the Verified List of impaired waters for the Pensacola Bay Basin that was adopted by FDEP Secretarial Order in November 2010. The TMDL establishes the allowable fecal coliform loading to the Blackwater River (tidal) that would restore the waterbody so that it meets its applicable water quality criterion for fecal coliform. The Blackwater River (tidal) is a Class III waterbody, with a designated use of recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife. The criterion applicable to this TMDL is the Class III criterion for fecal coliform. Potential sources listed in the Final TMDL report include agricultural land use run-off, septic tanks, and stormwater run-off from urban land uses.

East Bay River (FDEP Final TMDL)

A Total Maximum Daily Load (TMDL) for fecal coliform bacteria for the East Bay River (marine portion) has been established (2012). This waterbody was verified as impaired for fecal coliform, and therefore was included on the Verified List of impaired waters for the Pensacola Bay Basin that was adopted by FDEP Secretarial Order in November 2010. The TMDL establishes the allowable fecal coliform loading to the East Bay River (marine portion) that would restore the waterbody so that it meets its applicable water quality criterion for fecal coliform. The East Bay River (marine portion) is a Class II waterbody, with a designated use of shellfish propagation or harvesting; this designation includes all Class III uses of recreation, propagation, and the maintenance of a healthy, well-balanced population of fish and wildlife. The criterion applicable to this TMDL is the Class II criterion for fecal coliform. Potential sources listed in the Final TMDL report include septic tanks, pet feces, and sanitary sewer leakage in descending order of contributory magnitude.

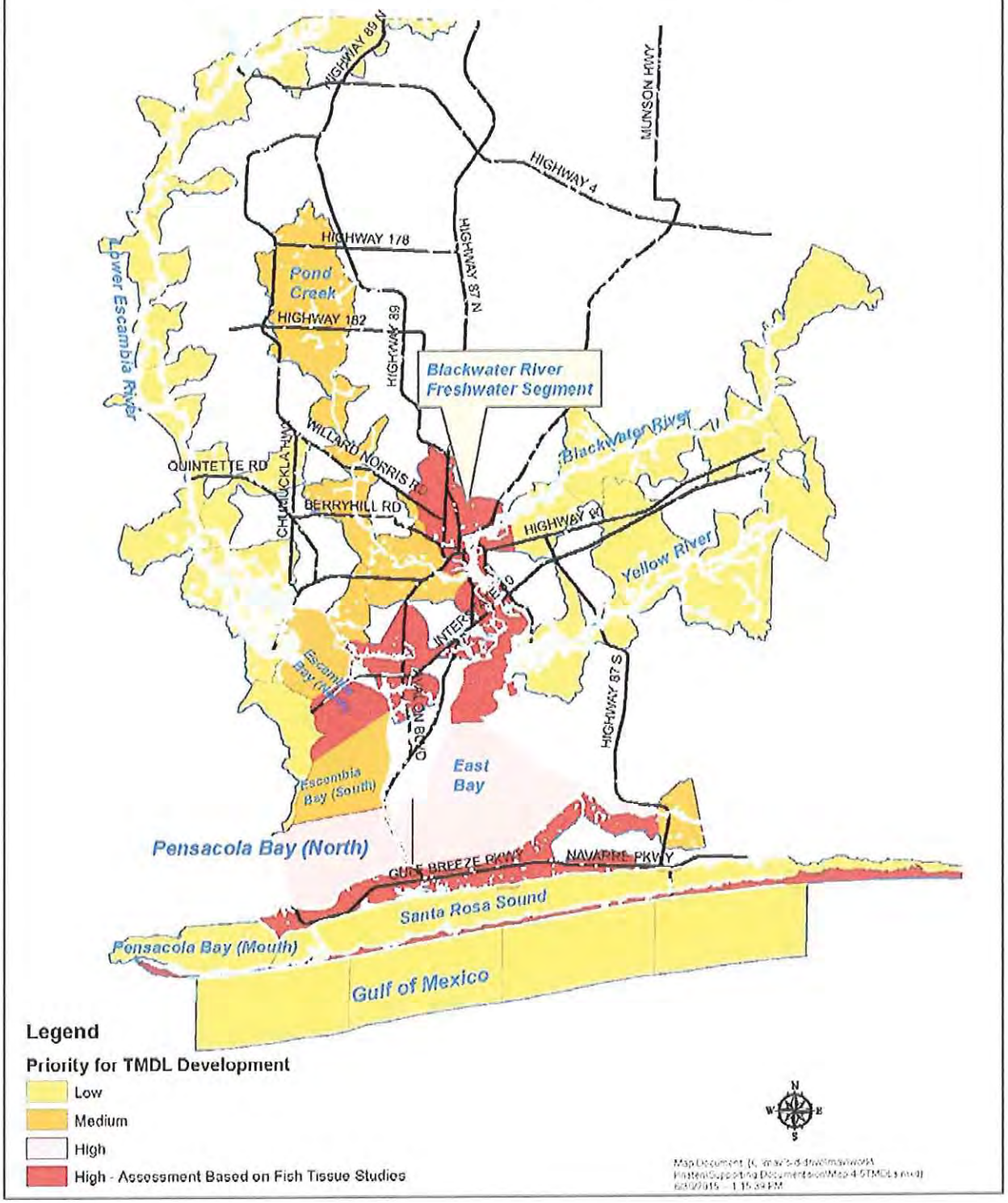
Escambia River (FDEP Final TMDL)

Total Maximum Daily Loads (TMDLs) for fecal coliform bacteria for the Escambia River, Texar Bayou, and Carpenter Creek have been developed. These waterbodies were verified as impaired for fecal coliform, and therefore were included on the Verified List of impaired waters for the Pensacola Bay Basin that was adopted by FDEP Secretarial Order in May 2006. The TMDLs establish the allowable fecal coliform loading to these water segments that would restore the waterbodies so that they meet their applicable water quality criterion for fecal coliform.

Pace Mill Creek (Finalized by EPA)

Pace Mill Creek is located east of the Escambia River, in the Pace area. Pace Mill Creek discharges to Escambia Bay through Bass Hole Cove, and eventually drains into Pensacola Bay. The drainage area for the creek is approximately 6.2 square miles (FEMA 2006). The Escambia River is less than three miles to the west. Wetlands are confined mainly to the riparian corridor and at the mouth of the creek, with limited agriculture. There has been rapid urbanization of the region in the past several decades. TMDLs for total nitrogen, total phosphorus, and biochemical oxygen demand have been established.

Map 4-5 - Verified Impaired Water Bodies with the Priority for TMDL Development Within Santa Rosa County



4.3.4 Stormwater Funding Sources

County-wide stormwater management, although imperative, is quite costly. Capital improvements, operating and maintenance, renewal and replacement of existing structures, water quality monitoring and administrative services are only a few examples of the many stormwater management issues that face Santa Rosa County every year.

In this section the funding sources that are available to financially support these activities will be discussed. Available funding sources include federal grants, state grants, state and local tax assessments, as well as additional federal bond and grant programs, that can be used as stand-alone monetary sources or can be used together to help provide the monetary support needed for some of the larger projects. Several of these options are presented below. Currently stormwater infrastructure in Santa Rosa County is funded primarily by developers with maintenance paid for using general funds. Some maintenance is funded by individual homeowner's associations in the County as well.

General Funds

Stormwater management funds in Santa Rosa County have traditionally provided from the General Fund. This source can best be considered as a bank retaining revenues which will fund county stormwater programs in the future. The source of funds for this alternative includes ad-valorem income, as well as other taxes. Other income which can be placed into the General Fund includes revenue sharing income and county-wide ad-valorem taxes (for activities completed for the citizens of the county). This revenue source can provide funding for administration, renewal/replacement, construction, maintenance, and water quality monitoring.

The principal advantage associated with utilizing the General Fund is that the accounting process is understood. The major disadvantage with using the General Fund is that many governmental services, except the utilities, are funded by the general fund. For this reason, competition for the funds is intense and historically, stormwater management programs have had a low priority. From a point of equitability, ad-valorem taxes are based on property values which are not always related to the property's impact on stormwater. For these reasons, many governmental entities are looking for another source of funding for stormwater.

Gas Taxes

These funds may be implemented for capital projects related to roads and can be used to fund road repair or construction. Santa Rosa County is responsible for a number of county-maintained roadways. As some stormwater management improvements can be integrated into road improvements or maintenance projects, the stormwater facilities can be indirectly funded or subsidized by the expenditure of gas tax funds. These funds, however, are generally intended to be limited to the capital improvement appropriations, project administration, design and construction. These funds should not be used to fund annual operation and maintenance activities (i.e. water quality monitoring programs).

The Gulf of Mexico – Florida's Toilet

How sewage discharges are fouling Florida's Gulf of Mexico tributaries, estuaries and coastal waters

Clean Water Network of Florida

June 2008

Introduction

Florida's coastal waters on the Gulf of Mexico are in trouble. According to the 2007 EPA Gulf of Mexico National Estuary Program Coastal Condition report, every program estuary on Florida's gulf shows degradation, with the main culprit cited as being "excess nitrogen pollution and stormwater runoff."

Water quality along Florida's environmentally and economically valuable beaches and bays suffers from algae blooms, including red tides; decreasing fisheries; loss of seagrass beds, oxygen levels too low to support life, and waters often filled with toxins and bacteria harmful to humans and aquatic life.

"Observations have confirmed that our nation's coastal waters are stressed," said Conrad C. Lautenbacher, director of the federal National Oceanic & Atmospheric Administration. "The potential for serious degradation in most of our estuaries necessitates that we reinvigorate efforts to address nutrient pollution" (NOAA 2007).

Coastal nutrient pollution has also been linked to increases in the intensity and duration of "red tides," periodic blooms of a marine alga that causes fish kills, low water oxygen conditions, marine mammal die-offs, human health problems, as well as economic losses. Sewage pollution, along with overuse of fertilizers, livestock waste and other nutrient pollutants combine to create ideal conditions for these blooms. Just one harmful algal bloom event can cause millions of dollars in losses to local coastal communities.

The causes of this over-nutrification are many, and include overuse of fertilizers and industrial discharges. However, a significant contributor to this problem is the many millions of gallons of essentially untreated, or poorly treated sewage that is discharged into our surface and ground waters every day. In a 2004 report on Florida's wastewater program, the Levin College of Law researchers said, "Domestic wastewater facilities are considered to be one of the most serious sources of pollution interfering with the beneficial uses of surface waters."

Whether from septic tanks, small "package plants" that serve one subdivision, wastewater reuse systems, sprayfield discharges, older wastewater treatment plants, or even due to mechanical failures in "advanced" systems, the amounts of contaminated sewage finding their way to the Gulf have truly made it Florida's toilet.

In 2005 Florida's swimming beaches had 3,428 days of beach closings and health advisories due to high levels of bacteria found in sewage, posing a threat to human health and our state's $41.6 billion beach-related tourism industry.

The public is also losing its shellfish resources. According to a sampling of Florida Department of Agriculture and Consumer Services Shellfish Division condition reports, during a period of average rainfall in April 2008, about half of the state's "conditionally approved" shellfish areas on Florida's Gulf Coast were "closed" to shellfishing, due to presence of fecal bacteria in estuarine water samples.

The public assumption is that raw sewage is piped to a wastewater treatment plant, and all of its contaminants removed by treatment technology. The reality is that most of Florida's sewage collection and treatment systems either do not treat wastewater to a high enough standard in the first place, or because of accidents, poor maintenance, or overloaded systems, they allow a large number of bacteria, toxins, nutrients and other contaminants to enter the environment. For example, "spray irrigation" of treated wastewater that is high in nutrients regularly spew millions of gallons into surface and groundwater, where they may pollute water bodies or contaminate drinking water supplies.
Septic tanks, which are increasing in use, instead of decreasing every year in Florida, hardly treat the sewage at all. Secondary treatment does not remove all the excess nutrients, pathogens and toxins. And all the systems that handle human sewage, especially the older ones, are plagued with mechanical failures, leaking pipes, and other problems that cause contaminated wastewater to be released directly into the environment on a frequent basis. The chances of a system owner getting fined or other enforcement penalties for these spills are slim to none.

In Lee County, 22 of the county's 80 sewage plants continued to send sewage into water bodies that empty into Charlotte Harbor, even after receiving warnings from DEP to repair malfunctioning equipment. The frequency of wastewater violations earned Lee fourth place, out of the 67 counties in the state, for wastewater plant violations (Morales 2008).

According to a study done by Environment Florida, 60% of the major facilities with Clean Water Act discharge permits in Florida exceeded their permitted pollutant limits in 2005.

More than 5 million gallons of sewage spilled in Duval, Hillsborough and Lee counties alone in 2003 (NRDC 2004). In the Florida Keys, the EPA estimates that the 24,000 septic tanks and 8,000 cesspits alone discharge over 1,200 lbs. of nitrogen and 326 lbs. of phosphorus every day, accounting for over half of the total nutrients entering marine waters in the Keys. (Darden 2001)

Sewage is not a minor risk; it is highly toxic. In addition to excess nutrients, it may contain a host of pathogens, including bacteria that cause dysentery and cholera; viruses that cause hepatitis; disease-causing protozoan such as *Cryptosporidium* and *Giardia*; and intestinal worms. Sewage also contains a chemical laboratory full of toxins, either originally in the sewage itself, such as those ingested in pharmaceuticals, or a byproduct of the treatment process, such as chlorine compounds. While treatment may remove most of these hazards, many may survive secondary systems or accidental releases.

Human health can be affected when sewage ends up in the water we drink or swim in. Each year, 1.8 million to 3.5 million illnesses in the U.S. are caused by swimming in water contaminated by sewage, and an additional 500,000 from drinking contaminated water. Sewage-contaminated shellfish cause medical expenses ranging from $2.5 million to $22 million each year (NRDC 2004).

Recognizing the problems posed by sewage discharges into water bodies and groundwater, the Southwest Florida Water Management District recommended in 2007 that all wastewater treatment facilities convert to Advanced Wastewater Treatment (AWT) by their next permit renewal cycle.

To ascertain the enormity of this wastewater contamination problem, and what, if anything, is being done to correct or prevent it, Clean Water Network of Florida (CWN of FL) reviewed hundreds of Florida Department of Environmental Protection (FDEP) files of wastewater treatment plants, reuse systems, and other facilities that create treated wastewater effluent that could potentially end up in the Gulf.

Our goal is to make the public more aware of what is happening to the sewage in citizens' own communities, and also to enlist them in our efforts to demand that the state, federal and local agencies to do more to enforce the current wastewater rules, and to require more facilities to upgrade their levels of treatment.

The data in this report represents information obtained from approximately 2003 to 2008. Permit expiration dates do not necessarily indicate that the plant is no longer permitted; its permit may have been renewed after we reviewed the file. We have also included a summary of some facilities' compliance record. We primarily looked at compliance records for facilities with at least one million gallons per day of treatment capacity. If there are no comments in the compliance/violations column on the spreadsheet, it does not necessarily mean there were no violations. The compliance files may not have been available for some reason, or they just may not have gotten recorded.

We want to emphasize that due to the enormous size of some of the compliance files, this report only contains enough information to form a generalized characterization of each facility's record. We strongly encourage anyone who would like more information to consult the files at the district and branch offices of the Florida Department of Environmental Protection.

Findings

From 2006 to 2008, we reviewed wastewater treatment records at the Ft. Myers, Tampa, Jacksonville and Pensacola district offices of the Florida Department of Environmental Protection, firstly, to determine how well Florida's wastewater treatment facilities along western Florida were accomplishing their purpose—preventing harmful materials from sewage from entering the environment, and secondly, to better understand the amount of untreated or partially treated sewage wastewater that is being released into surface and groundwater, and likely to eventually end up in the estuaries and coastal waters of the Gulf of Mexico. The time period studied was roughly 2003 to 2008.

Wastewater treatment plants

In Okaloosa County the Destin Water Users WWT effluent included prohibited levels of fecal coliform bacteria, nitrates, and heavy metals. In Manatee County, the city of Palmetto WWTF frequently discharges toxin-laden effluent into an aquatic preserve. In Key West, effluent with levels that violated standards for copper, cyanide, and dissolved oxygen were injected into the groundwater.

A history of mechanical failures, routine exceedances of water quality standards, leaky pipes and accidental spills were found to be the rule, not the exception, for wastewater treatment. Considering the records of only the 95 WWTPs with permitted capacities of 1 mgd or more, at least 65 (68%) were found to have a record of frequent and serious violations. And considering that records were not available to us for some of the plants where the compliance record is left blank in our text, the actual number of major plants with sewage pollution records, if fully known would actually be much higher.

From Pensacola to the Florida Keys, raw or partially treated sewage spews out of wastewater treatments systems. Of all the counties, Pinellas, perhaps due to an aging WWT system, showed the highest percentage with violations—100%, with all ten of its WWTs over 1 mgd capacity showing everything from excess nitrogen to chronic toxicity of their discharges.

One plant, the City of Clearwater WWT, which discharges its effluent into Old Tampa Bay, has had numerous spills containing chemicals toxic to aquatic organisms. Pinellas County's South Cross Bayou plant was one of the few that had violations so frequent and persistent that it encountered DEP enforcement more stringent than the usual "consent order." With numerous discharges of raw sewage in 2006-2007, DEP assessed a $30,000 penalty. In next-door Hillsborough, 7 of its 8 large plants have similar problems and records.

In Sarasota, a county that prides itself on its efforts to prevent excess nutrients entering its water bodies, where they may cause or exacerbate harmful algae blooms, the 1.78 mgd Gulf Gate AWWTP has had frequent and persistent problems meeting limits for nitrogen, ammonia and toxins.

The records for smaller plants are no better, showing about the same rate and types of problems. For example, the 0.115 mgd WWT in the City of Everglades showed numerous violations in

2005 for flow, TSS, coliform, TRC, nitrogen, and BOD. A small plant in Walton County, the 0.075 mgd of the City of Paxton, has an extensive history of nitrate and fecal coliform violations.

In rural Wakulla County, citizens are frustrated and angered over frequent beach closures and a high incidence of illnesses suspected to originate with unsafe swimming waters around Wakulla. While the local sewage treatment plant seems okay on paper, there are frequent spills and overflows from manholes. Recently local concerned citizens convinced the county government-owned plant to drop smoke bombs in several manholes to test for leaks in the collection lines. As suspected, the smoke was detected coming out under homes and from numerous locations from where it should not have been able to escape. This was an inexpensive way to get clear indications that the sewage could be leaking.

To make matters worse, Wakulla Springs is overgrown with plants that are feeding on nutrients that are getting into the spring from the City of Tallahassee's sprayfield – located many miles to the north. While the City of Tallahassee has promised to upgrade its facility, that improvement is several years away – a delay that is technically unnecessary.

Are such problems inevitable? No. It's a matter of making compliance a priority. Hurlburt Field Air Force Base's 1 mgd plant has had zero violations during the time period studied. It has such a good record for compliance that DEP gave it an award of excellence in 2006. Its military base status is apparently no guarantee of compliance. The nearby Naval Air Station in Pensacola shows a history of frequent violations.

Sprayfields

Seen by some as a better means of disposing of treated wastewater effluent rather than discharging into surface waters, sprayfields often create additional problems. Like other forms of disposal, low treatment standards (secondary treatment and basic disinfection, pH control) and system malfunctions in combination create a threat to water quality. We found many violations of standards, such as spills, violations of BOD, coliform and phosphorus (City of Lynn Haven). The City of Crestview sprayfield had numerous spills and leaks into Juniper Creek, TSS and fecal coliform violations. Spills and numerous nitrogen, phosphorus and other violations were found at the South Santa Rosa Utilities sprayfields.

But even if there were no violations, land applications for disposal or irrigation uses of reclaimed water, when using water treated only to the secondary level, may involve water containing a host of pathogens, nutrients, and toxins that survive the secondary process (EPA 2008, Rose 2004).

Septic tanks

While not a part of this study, it is important to note the impact of septic tanks on water quality. These systems are primarily used by single family homes in areas where municipal sewage is not available. Even after sewerage becomes available, homeowners often resist switching over to it, because of high hookup fees from the service provider.

Septic tanks provide very little treatment, which is typically limited to the separation of solids and decomposition by bacteria. They are frequently not maintained, and are prone to leakage and failure, contaminating both surface and groundwater.

Their numbers are already huge, and are growing. According to the Lee County Health Department website, "In Florida, 31% of the population is served by estimated 2.3 million onsite sewage treatment and disposal systems (OSTDS). These systems discharge over 426 million gallons of treated effluent per day into the subsurface soil environment."

In Florida, "onsite treatment and disposal systems" are primarily regulated by the Florida Department of Health. It would seem that as Florida becomes more and more urbanized that the use of septic tanks would decrease. However, according to DOH records, installations of new septic tanks went from 2,139,864 in fiscal year 1993-1994, in steadily increasing numbers, to 2,640,036 in 2006-2007—with undoubtedly profound implications for water quality, aquatic organisms, the shellfish industry, and human health.

Additionally troubling is DOH data showing that during this same period, despite the increasing number of septic tanks, permits for repairing these systems have actually gone down—from 21,319 in 1993-1994 to 16,057 in 2006-2007.

Underground Injection and RIBs

Like spray irrigation, the lower standards required for these methods of underground disposal are driving an increase of their use, causing major problems for the quality of groundwater and springs. Studies have shown that large nitrogen loadings from these wastewater facilities are a major source of elevated nitrates in some of Florida's springs (Evans 2004). Groundwater migrates, often mixing with surface waters, so those water bodies are also affected. The same pathogen, nutrient, and toxin issues that exist with sprayfields and water reuse irrigation apply, if the wastewater disposed of is treated only to the secondary level. The injection well in Punta Gorda is causing nitrogen loading to the groundwater. The combined UIC and land application at Rotunda West in Charlotte County has two consent orders for disinfection, pH, fecal coliform, pond overflows and other violations.

Enforcement

Wastewater treatment system violations are probably the least enforced infractions in the state of Florida. Our studies showed the vast majority of plants treating 1 mgd or more had frequent spills or chronic failures to stay within the allowable limits for pollutants discharged. Enforcement, if any, usually amounts to a "consent order", whereby the offender entity agrees to fix the problems by a certain date, and/or pay a small fine, which is usually set so low, it's usually cheaper to pay the fine than fix the problem.

In a 2004 consent order with Sanibel Bayou Utilities, DEP found that the WWTP, which was operating on an expired permit, and despite frequent, numerous, and serious violations of standards and failures to maintain equipment in proper working condition, DEP assessed the facility "less than or equal to $10,000."

Fortunately in this case, the citizens that live on Sanibel Island were not willing to accept the consequences of lax enforcement of the law and failing infrastructure so when the City leaders proposed that the City would buy out Sanibel Bayou Utilities, the citizens not only agreed, but they voted for a referendum to tax themselves to help offset the cost of decommissioning the failing package plant. The City's upgrading of the island's sewage treatment plant and removal of septic tanks is 90% complete. The remaining 10% of the residents that are still on septic tanks will soon be connected to the central sewer system as well. The City was conscious of finding a way to make these infrastructure investments affordable so a funding formula was designed to include the increased millage rate from the referendum, user fees and assessments.

Plant operators' failure to repair ongoing violations is not an exception; it's typical. According to a special report of the Fort Myers News-Press, the DEP has issued warnings and fines for at least one- fourth of the wastewater plants in Lee County, with little effect. The message weak enforcement sends to the operators is that it's ok to give a low priority to following wastewater treatment rules, or making expensive repairs to malfunctioning equipment, since there is no real deterrent to not being in compliance.

DEP enforcement in Florida, while continuing to decline overall, may be showing limited improvement for wastewater violations, according to the watchdog group Public Employees for Environmental Responsibility. In a report issued by the group this month, there were 215 wastewater enforcement cases in 2007, an increase from 2006. However, the average penalty assessment in domestic wastewater cases dropped 62% from 2006. Thus, while some program areas saw increases in civil penalty assessments, the same cannot be said for domestic wastewater. In addition, the PEER report issued in June 2008 found that in 2007, "county and municipal governments account for 50% of all cases in which civil penalty assessments met or exceeded $90,000, up from 44% in 2006. The majority of those cases were domestic waste cases, signaling significant problems with Florida's infrastructure."

PEER's press release also noted, "Taxpayer-funded entities are simply not complying with Florida's environmental laws. These enforcement numbers are not merely bean counting. By virtually every measure, Florida's water, air and soil quality are deteriorating and the enforcement of anti-pollution laws is the way we defend our environment and the legacy we leave to our children."

Conclusions and recommendations

The state of Florida has grown significantly in the last few years, especially along Florida's gulf coast. Along with increased population comes the need for more infrastructure, especially for the expansion and upgrading of sewage treatment facilities. Sewage treatment plants are at or near capacity, or in some cases, actually exceeding capacity. Treatment capacity and quality is not keeping pace with population growth. Enforcement of existing wastewater treatment rules is neither consistent nor effective. The result is an increasing amount of pollutants and excess nutrients entering our water bodies, groundwater and coastal beaches, contaminating drinking and bathing water as well as causing harmful algae blooms, fish kills and seagrass die-offs.

One of the reasons we are issuing this report is to make more citizens aware of the problems in their own cities and counties caused by inadequate and malfunctioning sewage wastewater treatment. The other is to enlist concerned citizens, including business and industry leaders, to lobby state and local officials to address these problems.

Our Recommendations

Enforce existing state and federal regulations for sewage treatment facilities.
This may seem obvious, but it is the most serious problem to address, because it "enables" many of the other problems. Many facilities are old, and need major repairs to leaky pipes and other equipment. When there is little or no deterrent to being out of compliance, then that expense will be postponed or never done at all. Monetary penalties must be high enough to act as a deterrent, especially if consent orders are violated, and warning letters ignored.

Improve basic treatment rules. Require all sewage treatment facilities to be at least Advanced Waste Treatment. This is very important because secondary treatment plants are still being approved, and secondary-treated wastewater is being allowed to be injected into the ground and applied on the land, even though many studies have shown that a number of viruses, protozoans, and other pathogens, as well as excess nutrients and chemical toxins can survive secondary treatment. Local governments can also create their own rules to address at least some of the problems associated with inadequate wastewater treatment.

Strengthen Florida Statutes – In the 2008 Legislature Senate Bill (SB) 1634 was proposed for better wastewater management. This bill would have amended Section 514.023, F.S. It provided for when a health advisory is issued that prohibits swimming in beach waters on the basis of bacteriological sampling, then the wastewater compliance evaluation section of DEP would be required to identify the source/sources of the contamination. It also required that within five days after discovering that a wastewater facility had a sewage spill, that the DEP would notify each county and municipality within a five-mile radius. DEP opposed the bill. This legislation did not pass this year, but something similar to it should be passed next year in order to better protect swimming areas from sewage contamination. The bill should be strengthened to require that when there is an ongoing problem with contaminated swimming waters and beach closures, that DEP would identify the source of the fecal contamination to determine if it originated from a human or animal source. This type of source tracking is now possible through the use of quantitative PCR (qPCR) coupled to host-specific primers and has become increasingly popular. Two of the specific approaches that are widely used by EPA and University labs include the use of the enterococcal surface protein (esp) and host-specific bacteroidetes probes.

More funding for wastewater treatment. While a number of state and federal grant programs are available at present, they need to be expanded so that cash-strapped local governments and privately owned community systems can be enlarged, upgraded and repaired. Some of the current programs require expensive local funding matches, putting them out of the reach of many

communities. There will be a high cost involved in improving Florida's wastewater infrastructure, but there is an even greater expense, in environmental, economic and human health costs, in not doing it.

Do not allow new connections to out-of-compliance facilities. We must not reward poorly functioning, polluting facilities by allowing them to add more customers, only to release more pollution. This would also create another incentive to keep a facility working properly.

Ban new surface water discharges and plan for phase out of existing surface water discharges. Discharging treated wastewater into surface waters needs to be a thing of the past. Once all treatment is up to AWT standards, it can be safely used in land applications.

Limit growth where responsible sewage disposal is not available. Like water supplies, availability of high-quality sewage treatment should become part of the concurrency test for new growth.

Safe and effective wastewater disposal is not out of our reach. But it can only be accomplished if citizens demand it, and if there is the political will among decision makers to take action. Our state and federal legislators still find many millions of dollars every year, no matter how tight the budget year, for projects of interest to their communities. Regulatory agencies can take enforcement action, or draft needed rules, and if they are given the support they need from the elected or appointed officials who guide them. What needs to happen is a new sense of urgency and priority.

If action is not taken, things will not unilaterally improve. Raw or poorly treated sewage wastewater will continue to pour out of leaky pipes, overflowing treatment ponds, and poorly designed sprayfields, in a steady and increasing flow to the Gulf of Mexico—Florida's toilet.

Glossary of sewage-related terms and abbreviations

AGP: Algal growth potential.

ASR: Aquifer storage and recovery. ASR refers to the recharge and storage of water in an aquifer system during times when water is plentiful, and recovery of the stored water during times when it is needed. When used as a form of sewage disposal, ASR may cause nutrient problems in surface, near shore, and underground water systems. For example, in the Florida Keys effluent stored underground makes its way to the near shore waters, causing degradation and mortality to the reefs as well as algae blooms.

AWT: Advanced wastewater treatment. This high level of wastewater treatment adds to secondary treatment additional filtration, high-level disinfection, nutrient removal, and removal of toxic compounds. It results in water that meets the quality standards for discharge into water bodies and poses the fewest risks to human health or ecology.

AWT standards: Discharges defined in Florida Statutes 403.086 as containing, on an average annual basis and measured in mg/L, no higher than 5 CBOD; 5 TSS; 3 TN and 1 TP, and have been subject to a high level of disinfection.

BOD: Biochemical oxygen demand. A measure of the amount of oxygen needed by microorganisms to decompose the organic matter in a water sample. The lower the level, the cleaner the water.

CBOD: Carbonaceous biochemical oxygen demand. A BOD test that measures only the carbonaceous oxygen demanding compounds. Also referred to as $CBOD_5$.

Classification of Florida surface waters: Class I: Potable water supply. Class II: Shellfish propagation or harvesting. Class III: Recreation, fish and wildlife. Class IV: Agricultural water supplies. Class V: Navigation, utility and industrial uses.

COD: Chemical Oxygen Demand. A measure of the amount of pollutants in a water sample, based on the amount of oxygen needed to oxidize, or break down, the chemical compounds. The higher the number, the more polluted the water.

Coliform: Fecal coliforms are bacteria that occur in human and animal sewage.

Conductivity: The standardized numerical expression of the ability of water or wastewater to carry an electric charge. Electrical conductivity estimates the amount of total dissolved salts or ions. A number of pollutants may be indicated by increased EC:

CWA. Clean Water Act. The primary federal rules created in 1972 and significantly expanded in 1977, with the goal of preventing and eliminating water pollution. For text and related information, refer to: www.epa.gov/lawsregs.

DBM: Dichlorobromomethane. Toxin, carcinogen. One of a number of toxic compounds called Trihalomethanes that are formed when water is disinfected by chlorination.

DEP: The Florida Department of Environmental Protection.

DMR: Discharge monitoring report. A report that DEP requires from NPDES permit holders. These reports are generated by the permit holder and sent to DEP on a monthly basis. Citizens can view these documents at a DEP office to see how well a facility is doing in terms of complying with their permit requirements.

DO: Dissolved oxygen. The concentration of oxygen, required by aquatic organisms, in water. Healthy water bodies usually have DO levels of 8 mg/l or higher.

EC: See Conductivity.

Effluent: Treated wastewater discharge from any treatment process or plant

FAC: The Florida Administrative Code, accessible at: www.flrules.org.

Fecal coliform: See Coliform

FS: Florida Statutes, accessible at: www.leg.state.fl.us/Statutes.

GPD: Gallons per day

MGD: Million gallons per day

Mg/l: Milligrams per liter.

Mixing zone: An area of surface waters around the point of a wastewater discharge and within which the discharge mixes with surface waters and does not meet normal water quality standards required by the CWA and state of Florida rules for one or more pollutants. Specific guidelines are given in 62-4.244 F.A.C.

NPDES: National Pollutant Discharge Elimination System. Authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

Nutrients: Chemicals used by plants for growth and metabolism, such as nitrogen and phosphorus.
Excessive amounts in water bodies have been linked to harmful algae blooms, low oxygen levels, fish kills and seagrass die-offs.

OFW: An Outstanding Florida Water is a state designation extended to waters considered worthy of special protection because of their natural attributes. This special designation is

intended to protect existing good water quality (62-302.700 F.A.C.). In general, DEP cannot issue permits for pollutant discharges to OFWs, which would lower their existing water quality.

Outfall: A location where treated wastewater is discharged to a surface water body, such as a river, stream, estuary, or ocean. 62-600.510 FAC prohibits outfalls into Class II waters.

pH: A measure of hydrogen ion activity in water, indicating acidic or alkaline (basic) properties. Using a range scale of 1 to 14, a reading of 7 would indicate acid/base neutrality, and a healthy water body. Lower numbers indicate increasing acidity, higher numbers more alkalinity.

Primary treatment: The first stage of wastewater treatment, which is limited to the settling and physical removal of solids in sewage. Generally removes only 40% of the suspended solids.

Recycled water: Also referred to as reused or reclaimed water, treated wastewater that is used for non-potable uses, such as landscape and golf course irrigation, instead of being discharged into water bodies.

RIB: Rapid infiltration basin. A rapid-rate land application system for wastewater disposal and groundwater recharge. A basin or system of basins at or below surface grade typically constructed so as to rapidly infiltrate into the ground surface water runoff or recycled water. RIBs for reuse of reclaimed water typically use a system of basins or percolation ponds, which may be include subsurface drains. Florida rules require water for this form of reuse to have had secondary treatment, basic disinfection, and nitrate level not exceeding 12 mg/l (62-610.500 F.A.C.).

Secondary treatment: Secondary treatment typically utilizes separation of solids and liquids, followed by biological processes to further break down organic material and remove suspended solids. The resulting effluent is then disinfected by adding chlorine or another antimicrobial chemical before discharge. Secondary is the minimum level of municipal treatment required by the Clean Water Act. "Secondary treatment" also means wastewater treatment to a level that will achieve the effluent limitations specified in subsection 62-600.420(1), F.A.C. Some pathogens, toxins and nutrients may survive secondary treatment.

Secondary treatment standards: Required per 62-600.420(1) FAC, minimum standards for effluent are no greater, measured in milligrams per liter, than 20 CBOD and 20 TSS, or 90% removal of each of these pollutants from the wastewater influent, whichever is more stringent. Disinfection and pH control are also required. Facilities may be required to provide for additional treatment to satisfy water quality standards for receiving surface waters. However, if an ocean outfall is being utilized, the standards are lower: 30 CBOD and 30 TSS, or 85% removal of these pollutants from the wastewater, whichever is more stringent.

Septic tanks: On-site domestic sewage devices, typically used when municipal sewage service is not available. Provide very little treatment, which is usually limited to separation of solids and decomposition by bacteria. Effluent is discharged into a drainfield and absorbed by the soil.

Sewage: Wastewater that typically contains fecal or urine material. However, it may also contain a wide range of substances, such as detergents, oils, pharmaceuticals and toiletries.

Sewage treatment: The process of removing or destroying contaminants in wastewater.

Spray irrigation: A form of land application, spray irrigation is a method of treated wastewater disposal utilizing land discharge, for absorption by soil and vegetation.

SSO: Sanitary sewer overflow.

STP: Sewage Treatment Plant.

TBEL: Technology Based Effluent Limitations. Minimum treatment standards.

TDS: Total dissolved solids. The amount of dissolved substances, such as salts or minerals, in water remaining after evaporating the water and weighing the residue.

Tertiary treatment: Includes wastewater treatments additional to secondary. May include filtration and other processes to remove nitrogen, phosphorus, organic matter and toxic chemicals.

TKN: Total Kjeldahl nitrogen. The sum of free ammonia and organic nitrogen compounds in water or wastewater.

TMDL: Total maximum daily loads. Clean Water Act pollution limit standards for discharges into impaired water bodies.

TN: Total nitrogen

TOC: Total organic carbon. The carbon content in water or wastewater that is present in the form of organic material.

TP: Total phosphorus

TRC: Total residual chlorine--the chlorine remaining in water or wastewater at the end of a specific contact period as combined and free chlorine.

TSS: Total suspended solids. A measure of the amount of suspended solids found in wastewater discharge. Generally, the higher the number, the more polluted the water.

Turbidity: The cloudy appearance of water caused by the suspended particulate matter or algae.

UIC: Underground injection control. Underground injection means effluent disposal or reuse by well injection into underground geologic formations.

Wastewater: Liquid discharge from any human activity, including domestic, industrial, and agricultural, and may contain a wide range of contaminants

WWTP, WWTF: Wastewater treatment plants and facilities.

Wastewater facility: Any facility which treats and discharges wastes into waters of the state or which can reasonably be expected to be a source of water pollution. Type I facility: a wastewater facility having a permitted capacity of 500,000 gallons per day or greater. Type II: capacity of 100,000 to 499,999 gpd. Type III: capacity of 2,000 to 99,999 gpd.

Water quality standards: Standards adopted by the Florida Environmental Regulation Commission pursuant to Chapter 403, and Florida Statutes and codes. Criteria for surface waters are listed in 62-302.530 F.A.C.

WQBEL: Water quality based effluent limitations. Additional treatments over the minimum technology standards.

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The world's most beautiful wastewater treatment plant

Chris Tackett (@ChrisTackett)
Design / Green Architecture
October 10, 2013

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Omega Institute, Rhinebeck, NY

Let this wastewater treatment plant show you how to live.

This may sound crazy, but it is exactly why the Omega Institute for Holistic Studies in Rhinebeck, New York hired Dr. John Todd of John Todd Ecological Design to design their Omega Center for Sustainable Living (OCSL), also known as the Eco Machine. We can learn some valuable lessons from this building.

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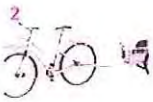

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The Omega Center for Sustainable Living may be the most beautiful wastewater treatment plant in the world. Invented by Dr. John Todd, the building is powered by solar and geothermal power, so it requires no additional power to operate. Unlike other wastewater treatment plants, the OCSL does not use chemicals to treat the water, but rather mimics the processes of the nature world, such as using a combination of microorganisms, algae, plants and gravel and sand filtration to clean sewage water and return clean drinkable water back to the aquifer.

In addition to doing all of this, the OCSL also functions as a classroom, to help educate and inspire people about the power of nature to provide solutions.

As the CEO of the Omega Institute, Skip Backus says, the OCSL purifies, beautifies and educates, all at the same time.

"The OCSL is a dynamic, living and breathing demonstration of how interconnected we all are with the world around us," says Backus. "Our goal is to help people reexamine how they relate to the world by showing them what's possible in terms of environmental sustainability, green energy, and regenerative design."

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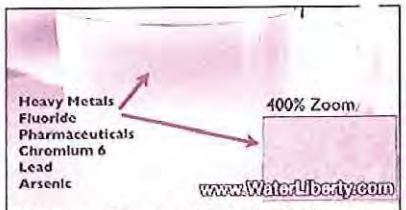

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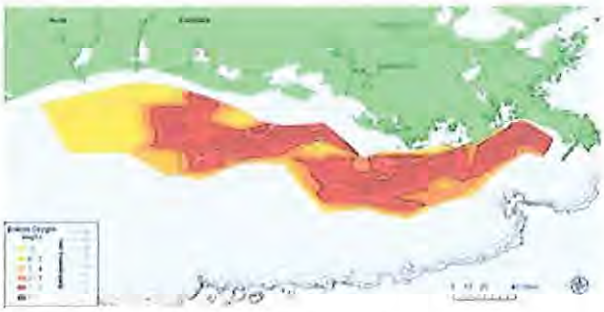
NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

2015 Gulf of Mexico dead zone 'above average'

Heavy June rains, high July nutrient runoff levels likely cause for increased size

August 4, 2015

Scientists have found this year's Gulf of Mexico dead zone — an area of low to no oxygen that can kill fish and marine life — is, at 6,474 square miles, above average in size and larger than forecast by NOAA in June. The larger than expected forecast was caused by heavy June rains throughout the Mississippi River watershed.



Map showeing distribution of bottom-water dissolved oxygen from July 28 to August 3, west of the Mississippi River delta. Black lined areas — areas in red to deep red — have very little dissolved oxygen. (Data: Nancy Rabalais, LUMCON; R Eugene Turner, LSU. Credit: NOAA)

The measured size this year — an area about the size of Connecticut and Rhode Island combined — is larger than the 5,052 square miles measured last year, indicating that nutrients from the Mississippi River watershed are continuing to affect the nation's coastal resources and habitats in the Gulf. The size is larger than the Gulf of Mexico / Mississippi River Watershed Nutrient Task Force (Hypoxia Task Force) target of 1,900 square miles.

"Dead zones," also called hypoxia areas, are caused by nutrient runoff from agricultural and other human activities in the watershed and are highly affected by river discharge and nitrogen loads. These nutrients stimulate an overgrowth of algae that sinks, decomposes, and consumes the oxygen needed to support life in the Gulf. Dead zones are a major water quality issue with an estimated total of more than 550 occurring annually worldwide. The Gulf of Mexico dead zone is the second largest human-caused hypoxic area in the world.

"An average area was expected because the Mississippi River discharge levels and associated nutrient data from May indicated an average delivery of nutrients during this critical month which stimulates the fuel for the mid-summer dead zone," said Nancy Rabalais, Ph.D. executive director of the Louisiana Universities Marine Consortium (LUMCON), who led the July 28 to Aug 3 survey cruise. A suite of NOAA-sponsored models forecasted a range of 4,633 to 5,985 square miles based on May nitrogen loading data provided by USGS. "Since the models are based largely on the May nitrogen loads from the Mississippi River, the heavy rains that came in June with additional nitrogen and even higher river discharges in July are the possible explanations for the larger size," said Rabalais.

Funded by NOAA and the EPA, the annual measurement mapping of the dead zone provides a critical scientific record of the trend of hypoxia in the Gulf, as well as the primary measure of progress used by the Hypoxia Task Force to determine whether efforts to reduce nutrient loading upstream in the Mississippi River Basin are yielding results. This year marks the 30th annual ship-based sampling that is the backbone of the mapping effort.

"The importance of having continued and sustained coastal observations are foundational in helping us better understand the size and impacts of the Gulf dead zone. This information ultimately informs the best strategies to reduce the size and the impacts of the dead zone, which will help improve the sustainability and productivity of our coastal economy," said Holly Bamford, Ph.D., assistant NOAA administrator for the National Ocean Service performing the duties of the assistant secretary of commerce for conservation and management.

"The annual ship-based sampling is the backbone of the mapping effort," said Diane Altsman, chief of staff of the EPA Gulf of Mexico Program. "It is important for us to partner with NOAA on supporting the cruise this year to ensure that the Gulf of Mexico Hypoxia Task Force has the critical information needed to assess their progress in mitigating hypoxia, part of our effort to restore the Gulf coastal ecosystem."

The largest previous Gulf of Mexico dead zone was in 2002, encompassing 8,497 square miles. The smallest recorded dead zone measured 15 square miles in 1988. The average size of the dead zone over the past five years has been about 5,500 square miles, nearly three times the 1,900 square mile goal set by the Hypoxia Task Force in 2001 and reaffirmed in 2008.

The hypoxic zone off the coast of Louisiana and Texas forms each summer threatening the ecosystem that supports valuable commercial and recreational Gulf fisheries. NOAA-funded research in the past decade shows hypoxia results in habitat loss, displacement of fish (including shrimp and croaker) from their preferred areas, and a decline in reproductive ability in some species.

Visit the Gulf Hypoxia web site for additional graphics and information concerning this summer's LUMCON research cruise, and previous cruises.

NOAA's National Ocean Service has been funding monitoring and research for the dead zone in the Gulf of Mexico since 1985 and currently oversees the NGOMEX program, the hypoxia research effort for the northern Gulf which is authorized by the Harmful Algal Bloom and Hypoxia Research and Control Act.

The National Centers for Coastal Ocean Science is the coastal science office for NOAA's National Ocean Service.

NOAA's mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources. Join us on Facebook, Twitter, Instagram and our other social media channels.

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The world's most beautiful wastewater treatment plant

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October 10, 2013

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Omega Institute, Rhinebeck, NY

Let this wastewater treatment plant show you how to live.

This may sound crazy, but it is exactly why the Omega Institute for Holistic Studies in Rhinebeck, New York hired Dr. John Todd of John Todd Ecological Design to design their Omega Center for Sustainable Living (OCSL), also known as the Eco Machine. We can learn some valuable lessons from this building.

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In addition to doing all of this, the OCSL also functions as a classroom, to help educate and inspire people about the power of nature to provide solutions.

As the CEO of the Omega Institute, Skip Backus says, the OCSL purifies, beautifies and educates, all at the same time.

"The OCSL is a dynamic, living and breathing demonstration of how interconnected we all are with the world around us," says Backus. "Our goal is to help people reexamine how they relate to the world by showing them what's possible in terms of environmental sustainability, green energy, and regenerative design."

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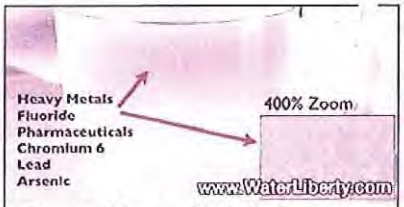

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The reason this building works so well is because of good design, but also data and science.

The idea that "what gets measured gets managed" is a popular maxim in business, but the principle has proven itself to be an influential aspect in sustainability, as well. By measuring the efficiency and sustainability of buildings, for example, LEED was able to create a hierarchy of Silver, Gold and Platinum levels of certification, which gave the building development industry new goals to which to aspire beyond simply aesthetics and low construction costs.

But one certification won't work for all levels of aspiration and while it is still important, LEED is not the only way we measure the sustainability of buildings. The Omega Center for Sustainable Living was built as part of the Living Building Challenge (LBC), which is the most intense green building certification program around.

Currently, there are only four Living Building Challenge Certified buildings in the world and the OCSL is the first building in the United States to gain both LEED Platinum *and* Living Building Challenge certification. What makes the LBC certification so difficult to attain is that rather than the building being rated upon completion of construction, the LBC certification is only granted after the building has been in operation for 12 months and has proven it has met the 16 prerequisites, one of which is that a building must process all of its wastewater on-site. It can't simply be pumped away.

So how does it work?

It is surprisingly simple.

To start, all of the water from toilets, sinks and showers on the Omega campus feeds into storage tanks that collect the human waste and the "gray water" from showering or sinks. Then this water is sent to the Eco Machine building, where it is fed to "microscopic algae, fungi, bacteria, plants, and snails."

The first stage is two 5,000 gallon Anoxic tanks located underground, where inside naturally occurring microbial organisms use the wastewater as food. They digest "ammonia, phosphorus, nitrogen, potassium, and many other substances in the water."

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Next, the water flows to the four man-made wetlands behind the OCSL building.

Here's how Omega describes the wetlands on their site:

> They are three feet deep, lined with rubber, and completely filled with gravel. About two inches beneath the gravel is wastewater, which flows from the anoxic tanks, to the splitter box, to the upper two constructed wetlands. The wetlands use microorganisms and native plants, including cattails and bulrushes, to reduce biochemical oxygen demand, remove odorous gases, continue the denitrification process, and harvest nutrients such as phosphorus. As the wastewater flows through the wetlands, the microorganisms and plants are fed.

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After the water had flowed through the four wetlands, it is already remarkably clean. According to Omega, there is "a 75 percent increase in the water's clarity and a 90 percent reduction in the water's odor" just from having passed through the anoxic tanks and wetlands.

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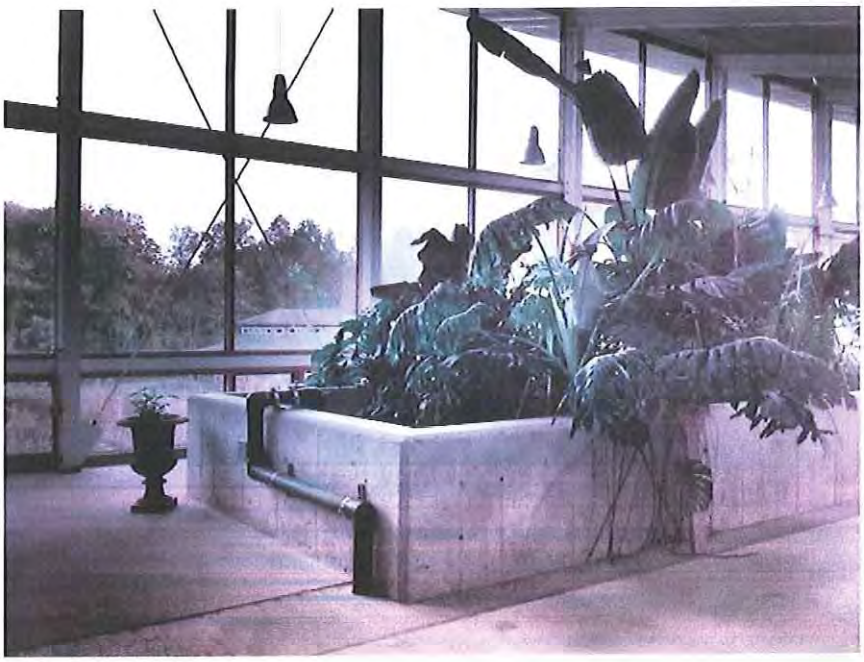
After the wetlands, the water is pumped inside to two aerated lagoons.

Omega writes,

> The aerated lagoons are divided into four cells, each 10 feet deep. At this stage, the water looks and smells clean, but it's not safe to touch. The plants, fungi, algae, snails, and other microorganisms of the aerated lagoons are busy converting ammonia into nitrates and toxins into harmless base elements.
>
> There is no soil in the aerated lagoons at the OCSL, yet beautiful tropical plants thrive here. The plants live on metal racks and their roots extend up to five feet into the water. The roots of the plants act as a habitat for the organisms in the lagoon, and are sustained by them. The flowers of these tropical plants illustrate the beauty that naturally treated "wastewater" can yield.



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All around the Omega campus, there are beautiful potted plants, which began as cuttings from the tropical plants grown in the lagoons. I even heard someone discuss the possibility that these plants could become an additional revenue stream by being potted and sold to the public.

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After the lagoons, the water moves back outdoors to a sand filter.

After the water has moved through the recirculating sand filter, it meets advanced wastewater standards and is as clean as water from your kitchen faucet at home.

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However, that's not where the Eco Machine process stops. After the sand filtering, the water is returned to nature via two dispersal fields under Omega's parking lot.

> In the dispersal fields, the reclaimed water is released back into the groundwater table, located below the surface. The reclaimed water is further purified by nature as it trickles down to the aquifer that sits 250-300 feet beneath campus.
>
> With this final step in the Eco Machine process at the Omega Center for Sustainable Living, Omega completes a closed hydrological loop in our water use. We draw water from deep wells that tap the aquifer; use the water in sinks, toilets, and showers; naturally reclaim the used water with the Eco Machine at OCSL; and release the purified water back to the aquifer, where the process can begin again.

It is this full-circle process that makes the Eco Machine so incredible. It challenges us to rethink the idea of "waste" and redefine the idea of "throwing something away." There is no "away". That's why the Eco Machine design is an inspiration to the idea of thinking of interconnectedness as a basis for solutions to the myriad problems we face. By assessing and measuring our impact on the world, we can then look at how the environment would solve a problem, in this case cleaning water, and design solutions to utilize those natural processes to meet our needs. That something so obvious and natural is now considered so radical and revolutionary just goes to show how far we've drifted from sustainable ways of living. Hopefully the Omega Center for Sustainable Living can help us see how to get back on track.

To learn more or to set up a tour of the facility, visit eomega.org

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Subject: FW: CATLINE CIRCLE

From: Anthony Piotrowski [tpetroinc@aol.com]
Sent: Tuesday, May 10, 2016 6:27 AM
To: Board of County Commissioners
Subject: CATLINE CIRCLE

DO NOT BUILD IN MY BACK YARD.THERE IS PLENTY OF LAND TO HAVE A TREATERD WASTE WATER DUMPED. WHEN I MOVED HERE ILIKE THE VEIW OF THE TREES. WHO WOULD WANT TO MOVE TO A NEIGHBORHOOD SURROUNDED BY WASTE TREATMENT.

Anthony Piotrowski
WHITE SANDS REALTY & ASSOC. OF NWF INC
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