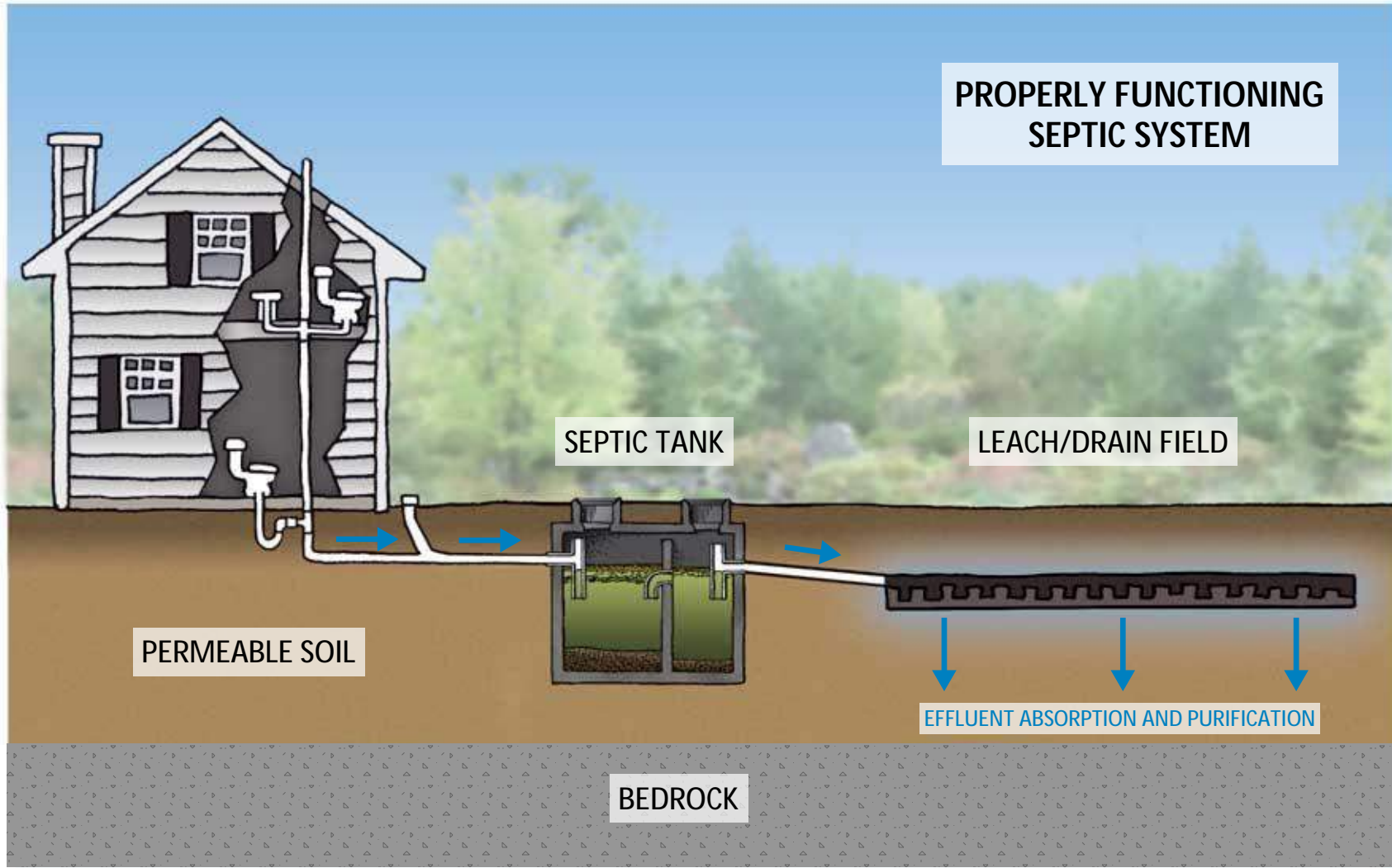


What's Wrong With Onsite Septic Systems?

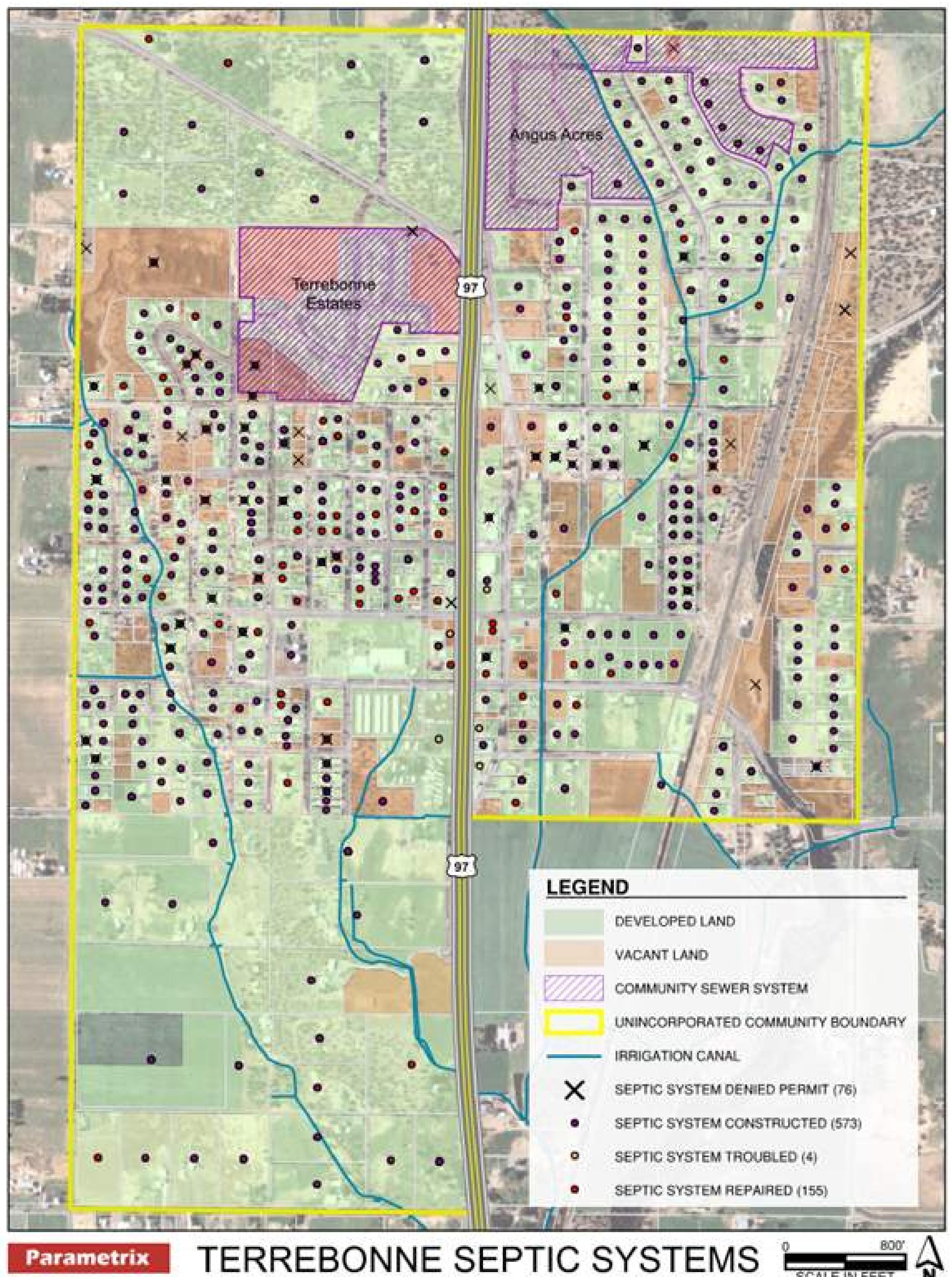
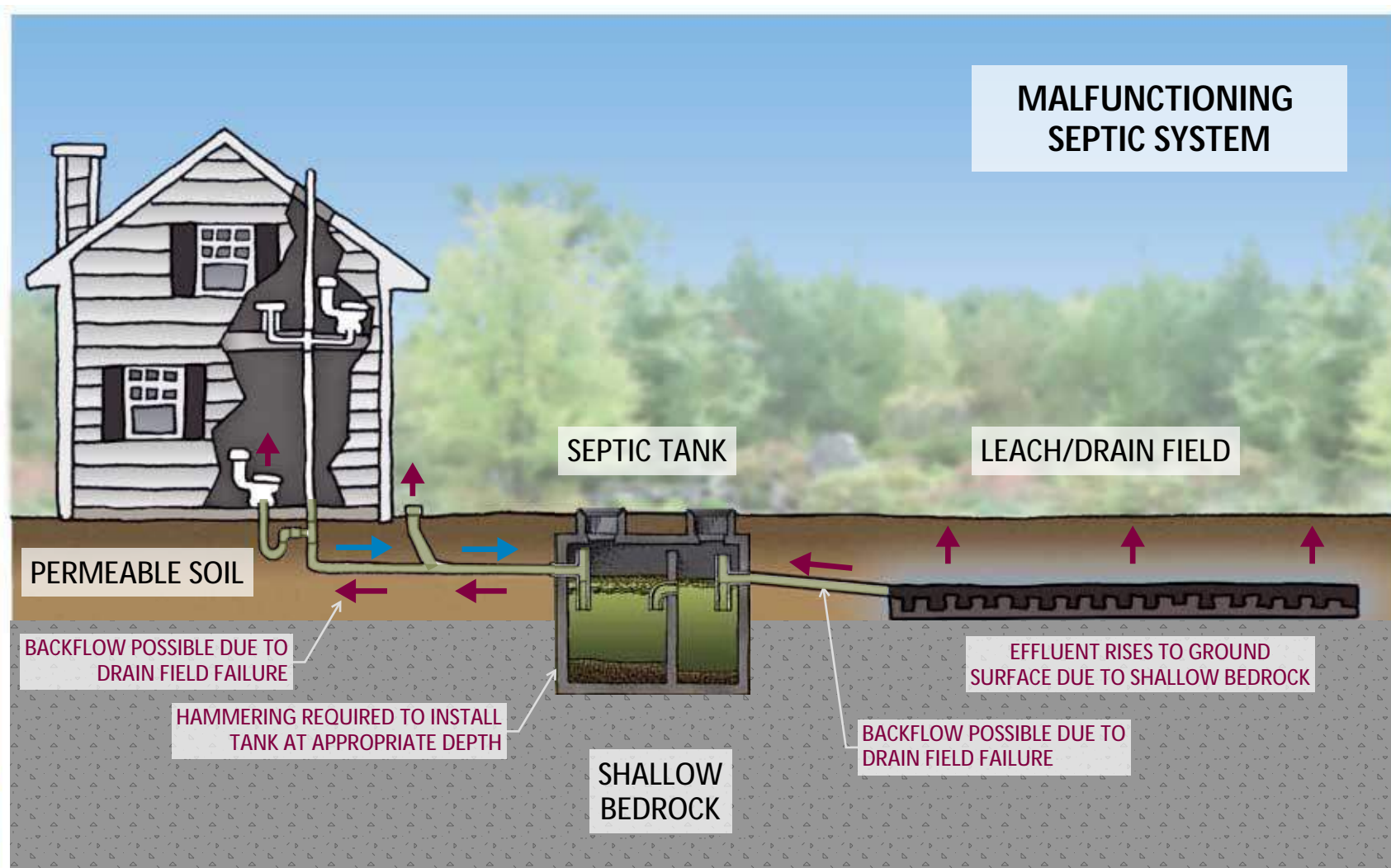


Public Health Hazards

Septic system failures are common and increasing in Terrebonne. According to the County Sanitarian, many of the systems are marginal at best with frequent and reoccurring problems.

System failures and the use of drill holes can cause untreated sewage to leach into surface waters and private groundwater wells, which some people use for drinking water.

Raw sewage from a failed septic system can even make its way to the surface of a yard where puddles of sewage can cause an increased health risk for residents if they come into contact with it. Health risks associated with insufficiently treated wastewater include upset stomach, diarrhea, eye irritation and skin rashes.



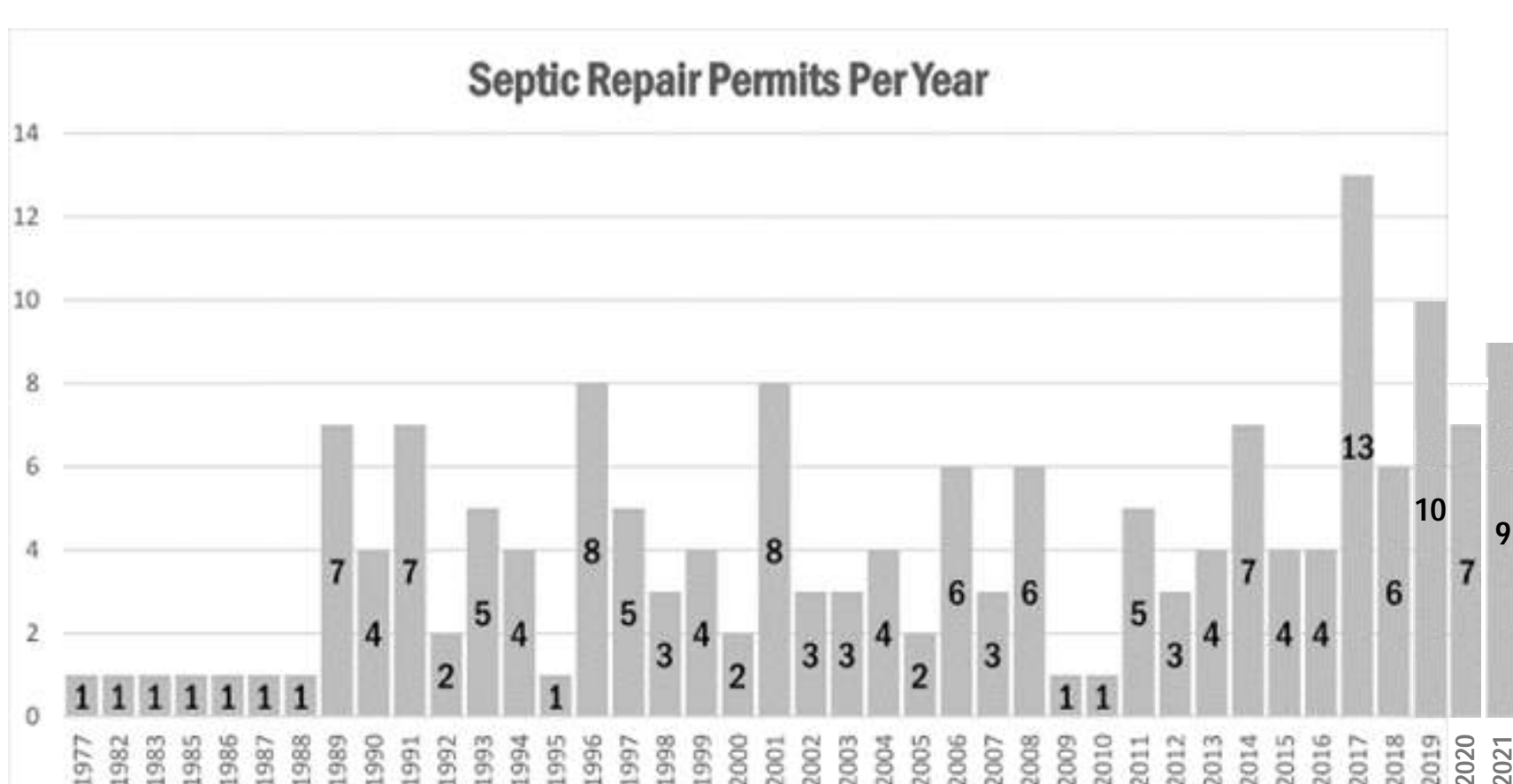
Economic impacts

•Commercial septic system failures can lead to temporary or permanent shutdowns for businesses.

•Residential septic system failures can cost homeowners \$5,000-\$35,000 in repair costs, if even feasible. Septic tank repair/replacement is not a permanent solution and may be required several times for some properties.

•Many of the lots in Terrebonne are unbuildable due to inadequate lot size and/or poor soil conditions.

•The area required for drainfields and reserve areas reduces developable area and excludes high-wastewater businesses (e.g. breweries, food processing, hotels).



Note: not all septic system issues are documented by repair permit records. Deschutes County reports that there are several additional properties that are struggling to operate, but have not obtained a repair permit.



Photo 1. Sewage overflow in public parking lot



Photo 2. Sewage overflow in public parking lot



Photo 3. Drillhole injecting effluent into the ground



Photo 4. Surfacing effluent in drainfield

What are the benefits of a Community Sewer System?



Better public health and water resource protection

With a community sewer system, wastewater is directed to a wastewater plant for centralized treatment and disposal. This protects people and water sources from potential exposures to untreated wastewater. Wastewater treatment facilities are professionally managed and held to strict treatment requirements that protect humans and the environment.

Managable system costs

When onsite septic systems fail, residents and businesses are faced with unforeseen pumping and repair costs. While pumping may only cost a few hundred dollars, system repairs and replacements can cost homeowners between \$4k-\$35k, depending on size and complexity (e.g. ATT systems). Some commercial septic system repairs have cost businesses well over \$100k. Some businesses in Terrebonne have been forced to close as a result. With a community sewer system, customers will be charged an upfront connection fee and a regular monthly sewer rate (subject to minimal annual increases, regulated by the Public Utilities Commission). This will eliminate the risk of massive unexpected costs from onsite septic systems failing.

Reliable system operation and maintenance by professionals

Residences and businesses in Terrebonne will no longer have to worry about their onsite septic system failing. Owners will have a minimal responsibility for keeping their onsite sewer service connection operational. In general, most people prefer to be on a shared sewer system if they have a choice, as the burden of keeping the system running smoothly falls on the local sanitary district, which has the money and expertise to ensure that wastewater is properly treated across the region. Also, in a shared sewer system, wastewater is conveyed away to a centralized treatment facility; anyone who has ever experienced a septic system backup on their property can appreciate what a benefit off-site wastewater treatment can be.

Reclaim drainfield areas for other uses

The space occupied by drainfields or reserve areas can be re-purposed for other uses. After properly abandoning drainfields, these areas could be used to build another structure or expand a business. Some larger lots may be able to partition or subdivide to create additional lots that can be developed.

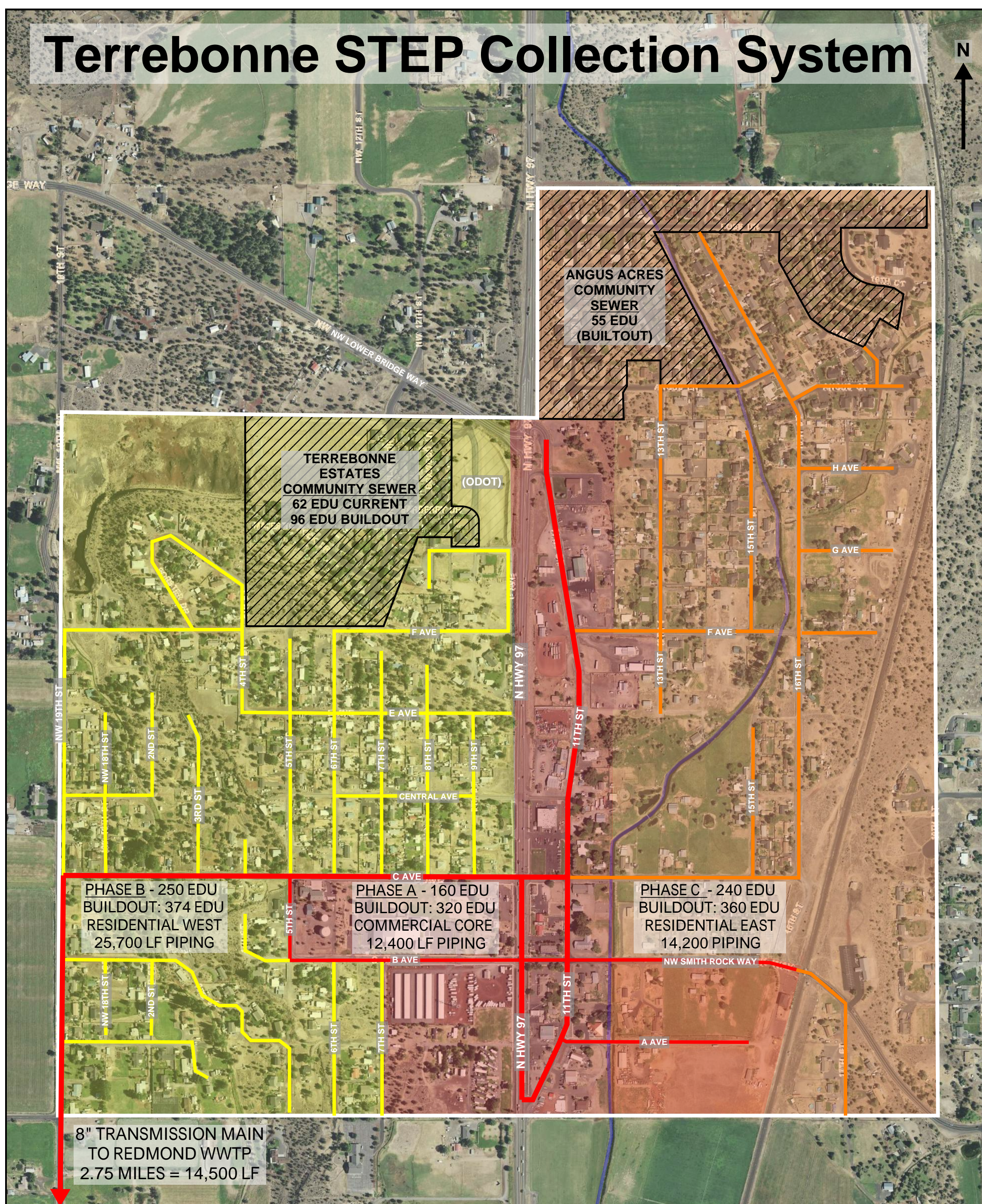
Many vacant lots will become buildable

In 1909 Deschutes County approved the Hillman Plat, which laid out the community in a rectangular urban grid of streets, blocks, and small lots, just 2500 square feet in area (25'x100'). Over time these small lots have been purchased in groups and consolidated, resulting in a variety of odd lot shapes and sizes. Septic systems typically require lot sizes of at least 10,000 square feet to fit a dwelling, septic tank, drainfield, and reserve area within required setbacks and clearance requirements. As a result, the smaller "leftover" lots under 10,000 square feet have been unable to install a septic system and develop. Deschutes County reports that there are approximately 188 undeveloped parcels within the Terrebonne sewer planning area. Many of these lots are currently unbuildable because the lot sizes and soil conditions are not sufficient for an onsite septic system. A community sewer system would enable development of vacant lots that were denied septic approval. Development of these vacant lots would benefit property owners and help address the housing shortage seen throughout Central Oregon.

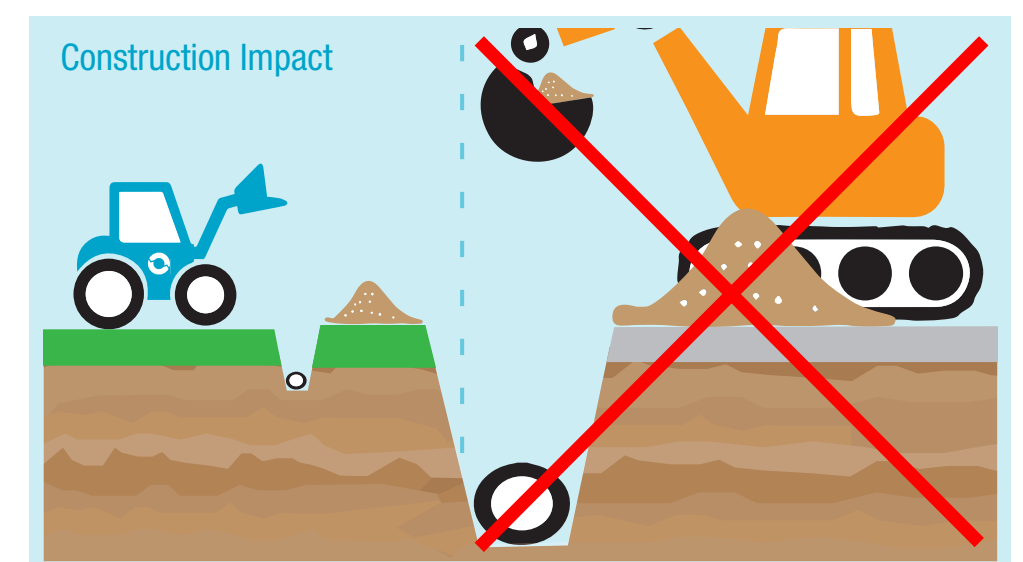
New Local Economic Opportunities

A community sewer system would facilitate the development and existence of certain multifamily residential, commercial, industrial, and mixed use developments, previously precluded due to onsite septic system limitations. Examples of such developments include food processing plants, hotels, and breweries. This could lead to the creation of new commerce and jobs in Terrebonne, strengthening local economic vitality.

Sewer System Concept Plans



Installing gravity sewer mains would be very disruptive and costly, due to the shallow bedrock common in Terrebonne.



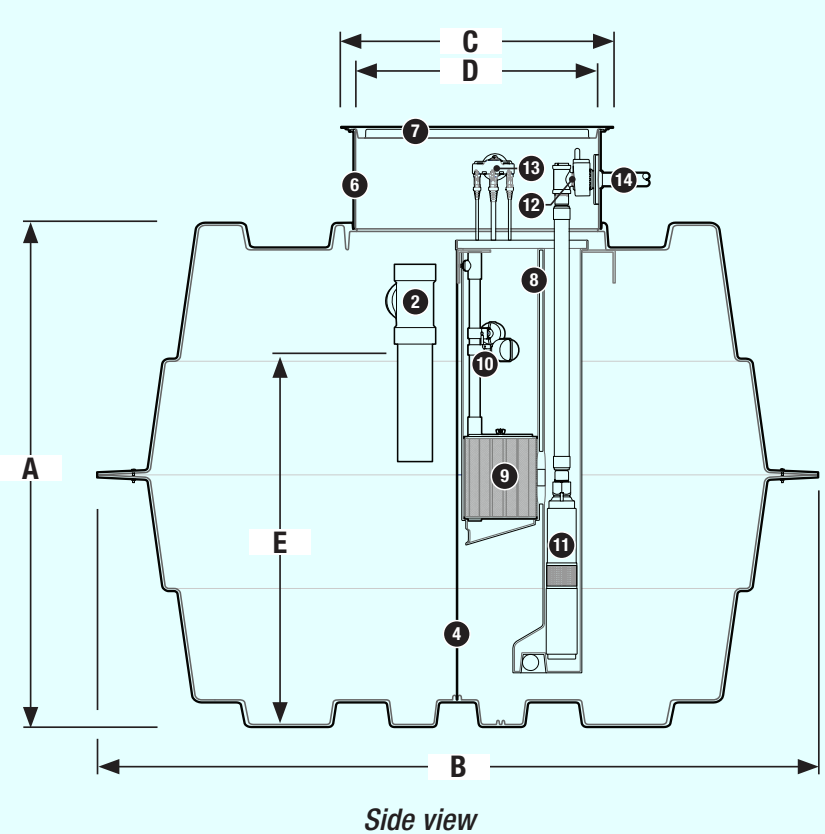
Instead, a STEP collection system is proposed to minimize trenching impacts and costs.

Septic Tank Effluent Pump (STEP) Collection System Overview:

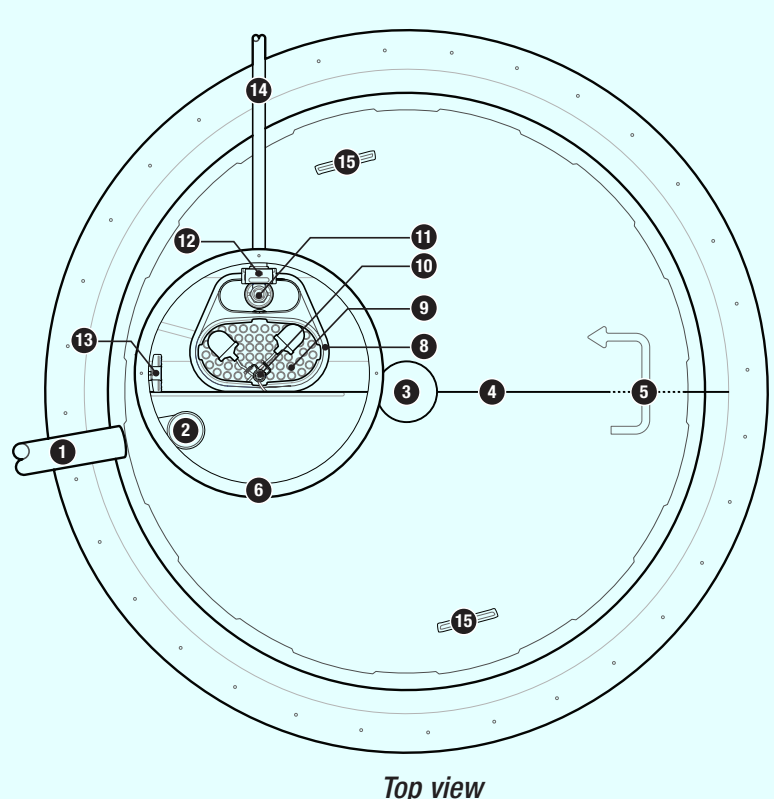
- STEP collection systems include onsite septic tanks, effluent pumps, and small-diameter, pressurized, shallow-buried pipes that follow the contour of the land.
- Mainlines are installed with directional boring or shallow trenching, which will minimize impacts to businesses, roads, and utilities - compared to conventional gravity sewer.
- Like water mains, STEP mains can be “surgically” extended to specific areas, streets, or new developments that need service most.
- The cost to make STEP mains available for connections can be as low as 10% of the cost of gravity sewer mains.



- 1 STEP tank (new or existing upgraded) provides primary treatment, so only liquids are conveyed to the treatment facility
- 2 Biotube® Pump Vault filters out solids, and our pumps can last more than 25 years,³ requiring minimal or no maintenance.
- 3 One-inch (25-mm) diameter service laterals can be easily installed with small excavation equipment.
- 4 Small-diameter mainlines follow the contour of the ground, saving on excavation costs. No expensive manholes or lift stations are required.
- 5 Primary wastewater treatment provided by the Prelos Sewer can decrease the capital cost and operating cost of the wastewater treatment plant.⁴

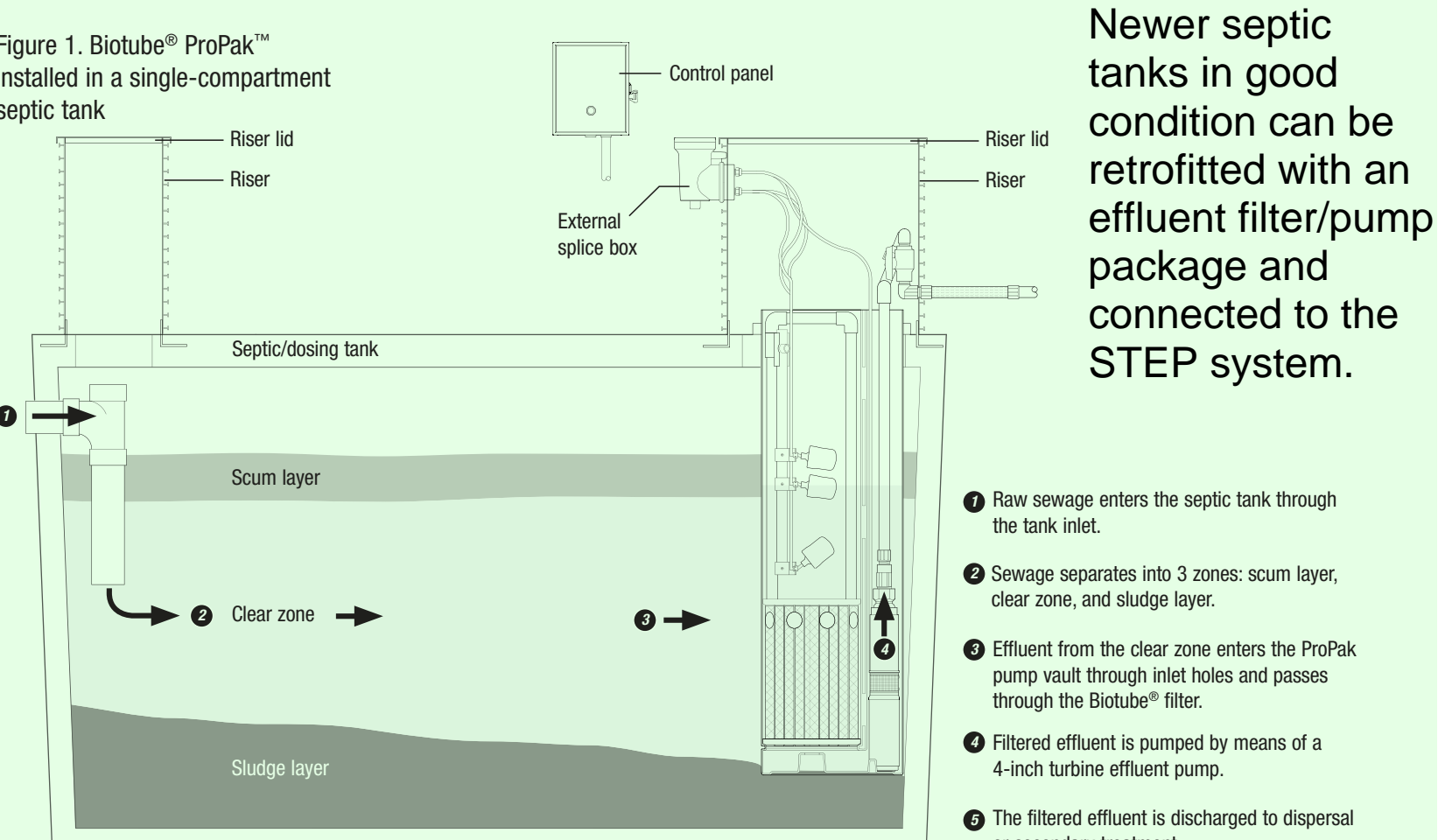
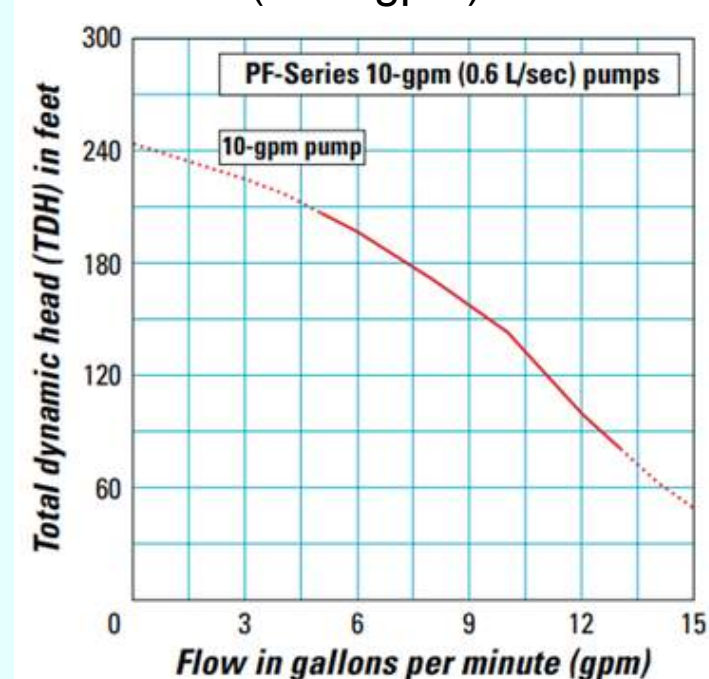


Older septic tanks in poor condition would be replaced with the Prelos Processor shown on the left, which includes a chamber for primary treatment, a filter, and an effluent pump. After installation of this system, a property would be able to connect to the STEP system.



- | | | |
|-----------------------------|--------------------------|-----------------------|
| 1 Inlet | 6 Access riser | 11 Pump |
| 2 Inlet tee | 7 Access lid | 12 Discharge assembly |
| 3 Support column | 8 Pump vault | 13 ClickTight™ |
| 4 Baffle wall (full-length) | 9 Biotube® filter | 14 Discharge |
| 5 Baffle pass-through | 10 Float switch assembly | 15 Lifting bracket |

The pumps are lightweight, reliable, and designed for low-flow, high-head applications so they can pump against a wide range of system pressures (80-210 ft TDH = 35-91 psi) within a tight range of flow rates (5-13 gpm).

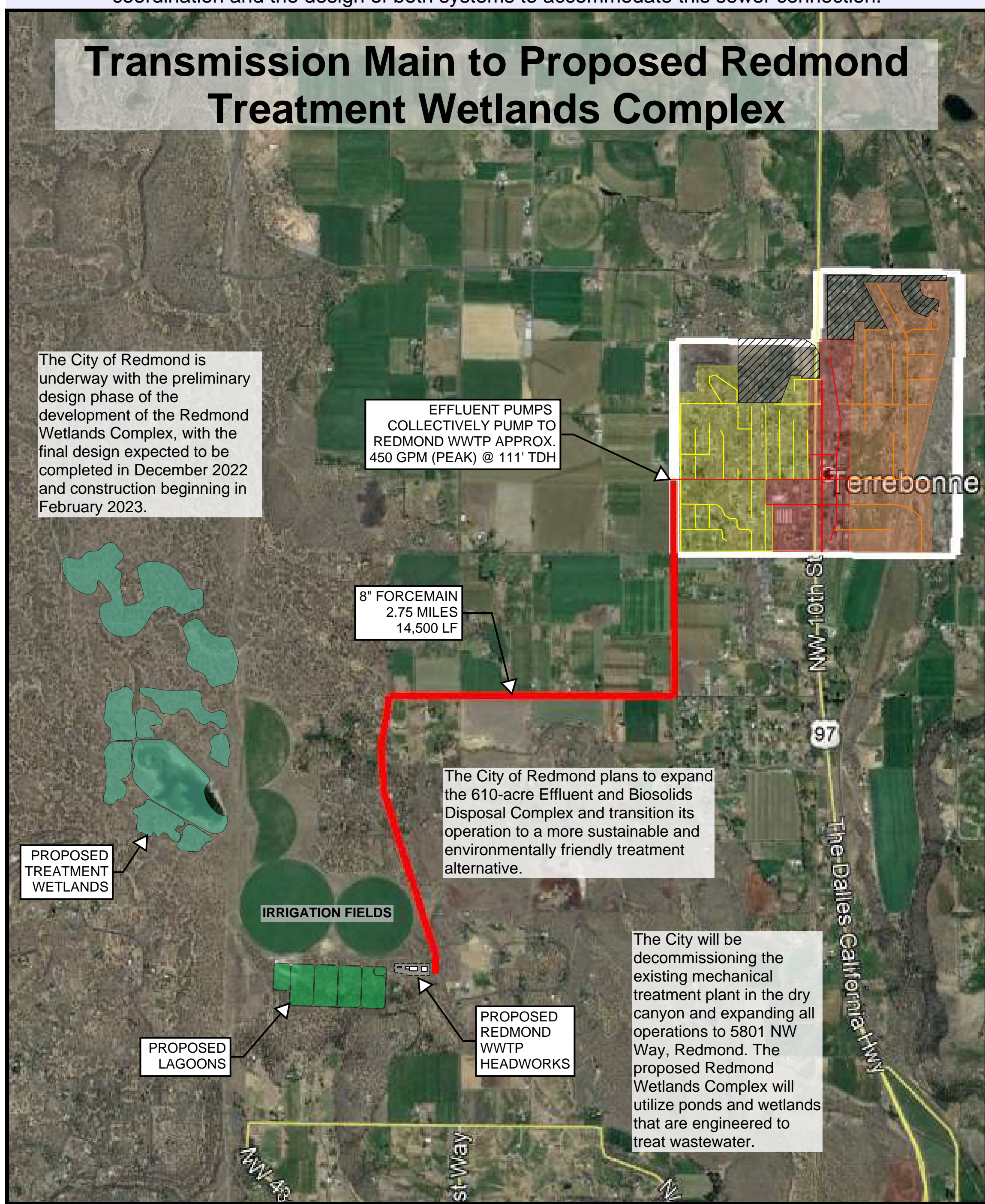


Newer septic tanks in good condition can be retrofitted with an effluent filter/pump package and connected to the STEP system.

- 1 Raw sewage enters the septic tank through the tank inlet.
- 2 Sewage separates into 3 zones: scum layer, clear zone, and sludge layer.
- 3 Effluent from the clear zone enters the ProPak pump vault through inlet holes and passes through the Biotube® filter.
- 4 Filtered effluent is pumped by means of a 4-inch turbine effluent pump.
- 5 The filtered effluent is discharged to dispersal or secondary treatment.

The City of Redmond is favorable towards the possibility of accepting wastewater from Terrebonne. Deschutes County and the City have prepared a Memorandum of Understanding (MOU) to facilitate further coordination and the design of both systems to accommodate this sewer connection.

Transmission Main to Proposed Redmond Treatment Wetlands Complex



The City of Redmond is underway with the preliminary design phase of the development of the Redmond Wetlands Complex, with the final design expected to be completed in December 2022 and construction beginning in February 2023.

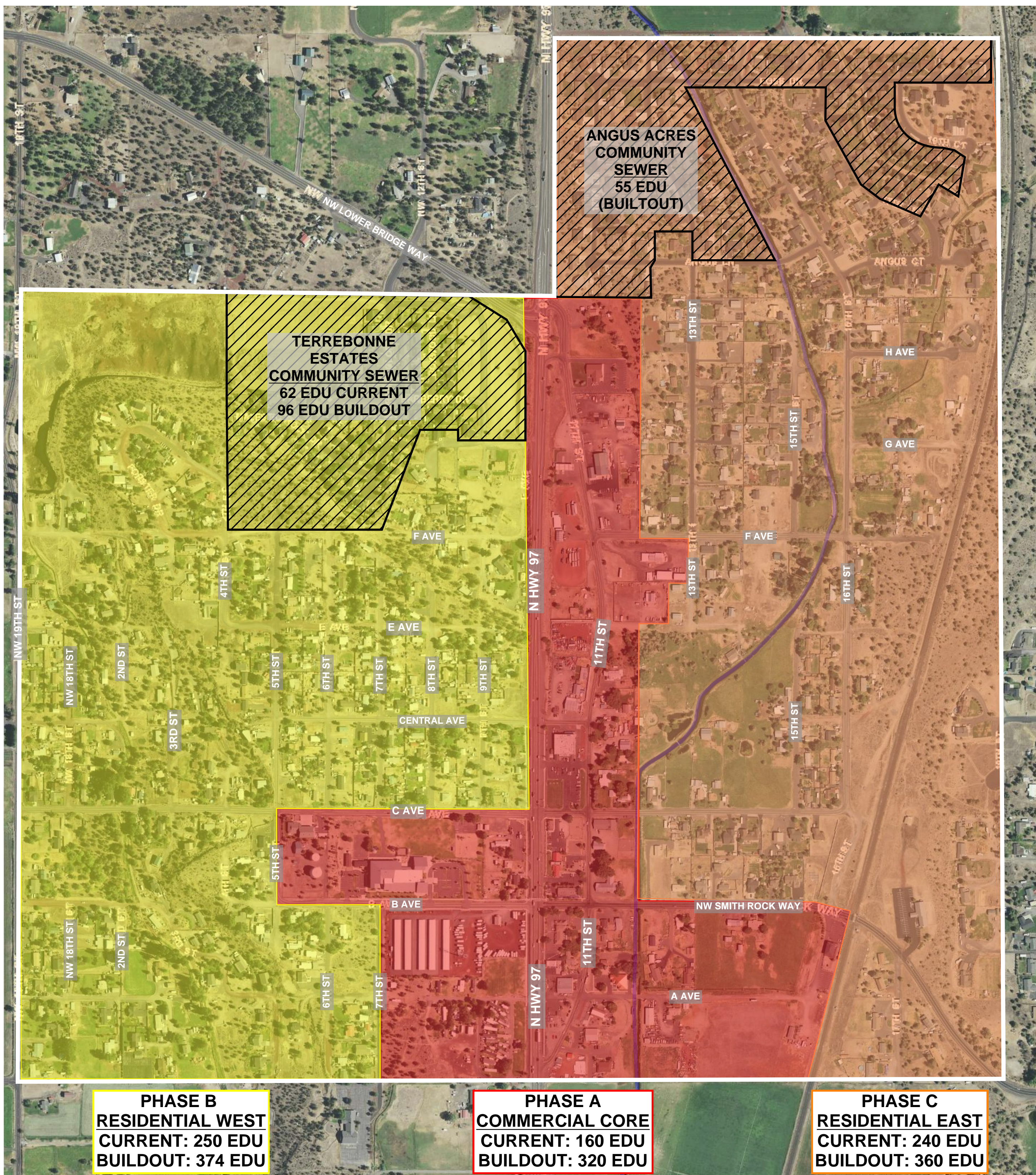
EFFLUENT PUMPS COLLECTIVELY PUMP TO REDMOND WWTP APPROX. 450 GPM (PEAK) @ 111' TDH

8" FORCEMAIN 2.75 MILES 14,500 LF

The City of Redmond plans to expand the 610-acre Effluent and Biosolids Disposal Complex and transition its operation to a more sustainable and environmentally friendly treatment alternative.

The City will be decommissioning the existing mechanical treatment plant in the dry canyon and expanding all operations to 5801 NW Way, Redmond. The proposed Redmond Wetlands Complex will utilize ponds and wetlands that are engineered to treat wastewater.

Phasing Plan and Estimated Schedule



For the purposes of this study, the planning period is 20-years and the Terrebonne service area has been divided into three separate phases of roughly equal size.

The constructed sewer system would initially serve just the Commercial Core in Phase A, with the ability to expand and serve Phase B and Phase C in the future, if and when requested by property owners in these areas.

Below is a summary of the three proposed system phases:

Phase A: Commercial Core

- This area has the highest concentration of septic system issues, businesses, and small residential lots
- The terrain in this region gently slopes toward Hwy 97 and 11th Street and north toward Lower Bridge Way
- 160 EDUs existing (EDU = equivalent dwelling unit)
- 320 EDUs at full buildout

Phase B: Residential West

- This area is mostly residential with larger lot sizes and generally fewer septic system issues
- Terrain in this region is relatively flat on the plateau and slopes down to the west from the plateau edge
- 250 EDUs existing
- 374 EDUs at full buildout, assuming eventual annexation of Terrebonne Estates

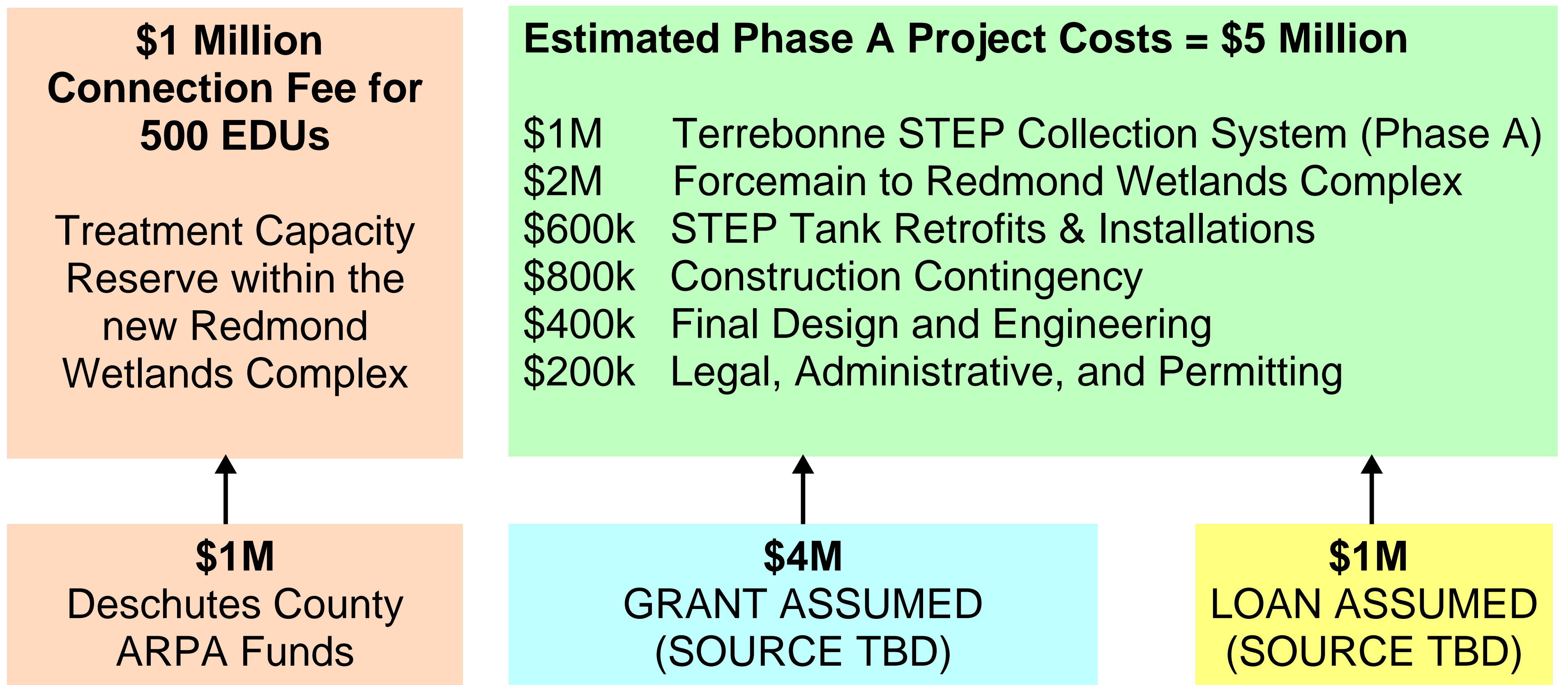
Phase C: Residential East

- This area is mostly residential with larger lot sizes and generally fewer septic system issues
- Terrain in this region is relatively flat, rural, and divided several COID irrigation laterals
- 240 EDUs existing
- 360 EDUs at full buildout, assuming eventual annexation of Angus Acres

Year	2020	2021	2022	2023	2024	2025
Terrebonne Sewer Project						
Wastewater Feasibility Study						
Sanitary District Formation						
Preliminary Engineering						
Funding Applications						
Final Engineering						
Construction (Phase A)						
ODOT US97: Lower Bridge Way – NW 10th St Project						
Planning						
Design						
Construction						
Redmond Treatment Wetlands Complex Project						
Planning						
Preliminary Design						
Final Design						
Construction						

Cost Estimates

Estimated Capital Construction Costs



Estimated Hookup Fees and Monthly Rates

Phase A - Financial Summary	
Total Estimated Capital Costs (Phase A)	\$ 5,000,000
Initial EDUs	160
Upfront Connection Fees per EDU (estimated)	\$ 8,000
Assumed monthly sewer rate per EDU	\$ 65
Monthly Revenues	\$ 10,400
Monthly Operations & Maintenance Costs (\$20/EDU)	\$ 3,200
Monthly Service Fees to Redmond (\$20/EDU)	\$ 3,200
Monthly Debt Service	\$ 4,000
Maximum Loan Balance	\$ 1,000,000
Required Grant Funding	\$ 4,000,000
Required grant funding as percentage of total project cost	80%

Actual hookup fees and monthly rates are subject to change, depending on actual construction costs and the extent of grant funding awarded to this project.

The intent of the TSAG and project team from the onset of this study was to provide cost-effective, affordable sewer solutions to the Terrebonne community.

The Sanitary District intends to keep residential rates and fees in-line with neighboring communities, within the following ranges.

Hookup Fees: \$5k - \$10k
Monthly Rate: \$60 - \$70/month

What does the \$65/mo rate cover?



- Monthly Operations & Maintenance Costs (\$20/EDU)
- Monthly Service Fees to Redmond (\$20/EDU)
- Monthly Debt Service

What do neighboring communities pay for sewer?

City	Monthly Rate/EDU	Connection Fees
Madras	\$67.00	\$5,512 SDC
Redmond	\$32.58	\$4,371 SDC \$505 tap fee
Sisters	\$40.01	\$4,814 SDC \$550 tap fee
Bend	\$57.35	\$5,223 SDC \$9,077 tap fee
Prineville	\$53.99	\$2,629 SDC \$841 tap Fee

Sanitary District Formation Process

Terrebonne Sewer Advisory Group (TSAG)

Terrebonne residents and business owners were invited to participate in the Terrebonne Sewer Advisory Group (TSAG) to gather more focused input and refine design alternatives. This group included approximately 7-9 key stakeholders from the community, representing the grocery store, mobile home park, vacant development parcels, and several other businesses/properties. Study documents and meeting minutes are posted to the County webpage for public review.

Only legal entities are eligible to apply for public infrastructure grants and loans.

While Deschutes County is a strong supporter of the Terrebonne community and this planning process, it does not intend to own and operate a sewer system in Terrebonne.

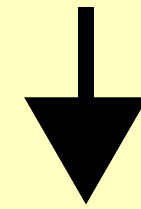
The Terrebonne Sewer Advisory Group (TSAG) intends to form the Terrebonne Sanitary District by filing a petition for formation (option 1 below)

There are three procedures that may be used to form a special district:

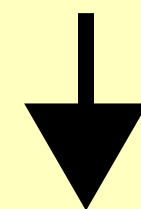
- (1) filing of a petition for formation
- (2) initiation by and order of the county board
- (3) obtaining consent from all property owners within the area of the proposed district

Sanitary District Formation Process (by Petition, option #1):

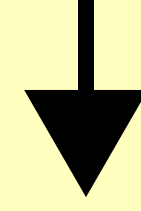
File prospective petition with County Clerk, including a description of the proposed District boundary.



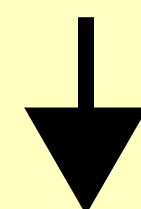
Obtain petition with at least 15 property owner signatures within 6 months of election.



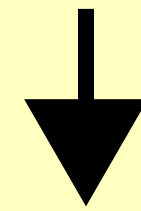
Submit Petition to County Clerk with economic feasibility statement and a cash deposit for certification.



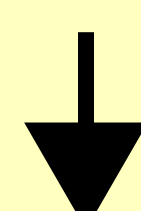
Once the Clerk determines that the required number of signatures has been gathered and notifies the chief petitioner, the chief petitioner files the petition with the county board. The board then sets a public hearing date not less than 30 or more than 50 days after the date of filing with the board, along with notifications to the public.



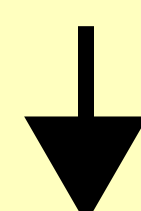
Board of Commissioners hold first hearing.



If the board approves the petition as presented or modified, it enters an order declaring the name of the district and boundaries. The order must also schedule a second hearing not less than 20 nor more than 50 days after the date of the order, including notifications to the public.



After the second hearing, if district does not have a permanent rate (tax) or 15% or 100 electors (whichever is less) do not request an election, the board may issue an order formally creating the district.



Terrebonne Sanitary District is Legally Formed