Lewes BPW WWTF Contingency Committee

Overview of Activities

Background: 2022 GHD Study *

- **Option 1**: Harden existing site - $23M capital / $2M annual O&M
- **Option 2**: New site at higher elevation
  - 2a - discharge via spray irrigation or rapid infiltration beds - $156M / $1M
  - 2b - discharge via existing outfall into the canal - $114M / $1M
  - 2c - discharge to ocean outfall - $186M / $1M
- **Option 3**: Partner with Sussex County at Wolfe Neck WWTP expansion
  - 3a - discharge to existing Lewes outfall to the canal - $20M / $1M
  - 3b - discharge to constructed wetlands on Wolfe Neck site - $20M / $1M

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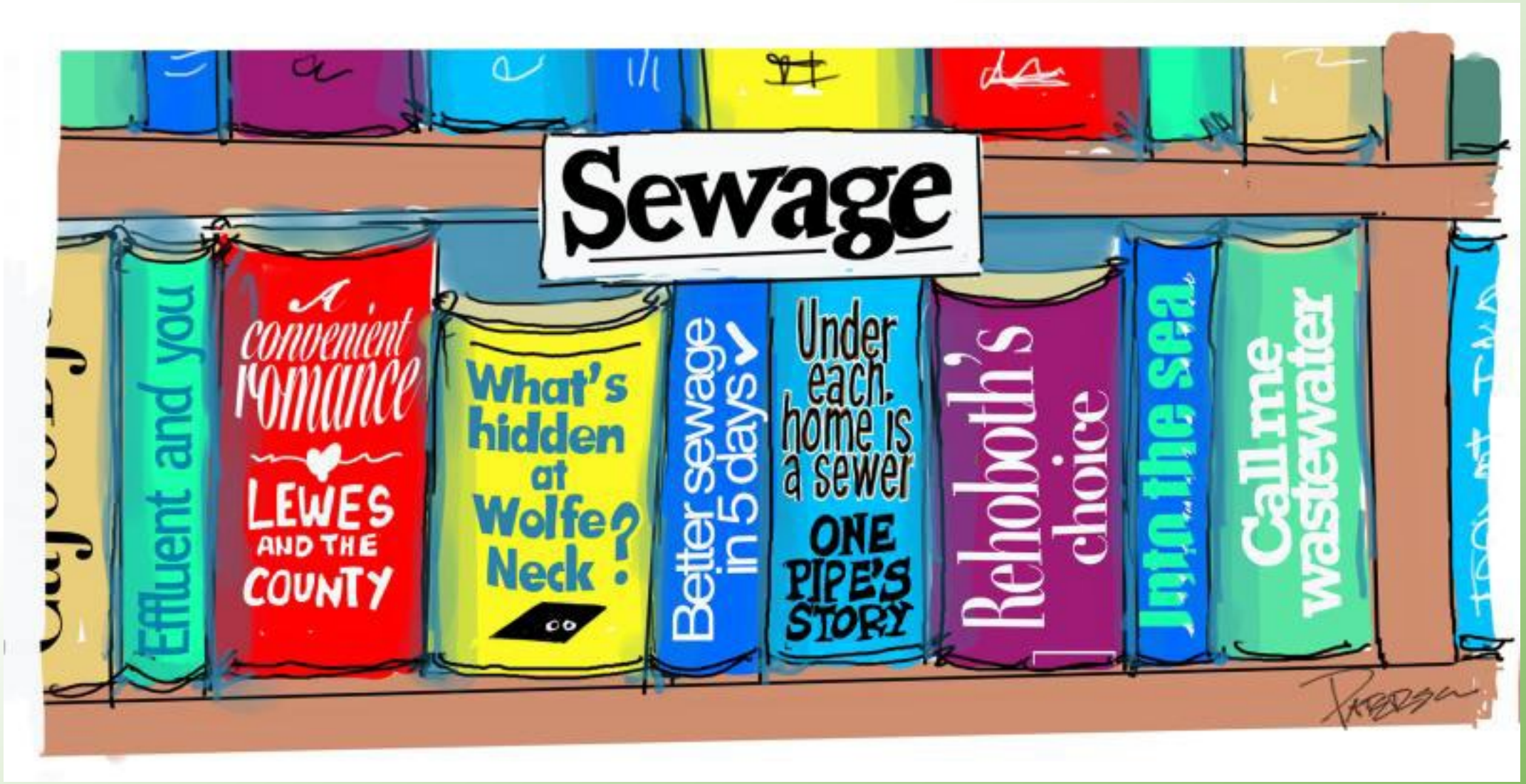
* *Costs were for Lewes only*

Background, cont.

- Seven Workshops – March 2022 through June 2023
- Public comments

- Board decision – focus on Option 3

- BPW resolution – July 2023 – WWTP Contingency Committee
  - Evaluate Options 1 & 2
  - Consider other proven treatment technologies
  - “Just in case”


Sewage
Effluent and you
A convenient romance
LEWES AND THE COUNTY
What's hidden at Wolfe Neck?
Better sewage in 5 days
Under each home is a sewer
ONE PIPE'S STORY
Rehoboth's choice
Jen in the sea
Call me wastewater

Situation has changed in the last year

- Archeological findings at Wolfe Neck site make Option 3b for a constructed wetland highly improbable
- Leadership change at Sussex County Engineering Department
- Sussex is now pursuing an ocean outfall, **new Option 3c**
- This changes the costs and practicality of some options
- GHD options assumed activated sludge technology
  - Invented in 1914
  - Newer technologies are available

WWTP Contingency Committee

Members

Barbara Curtis, Chair

Earl Webb, Board Member

Austin Calaman, General Manager BPW

Tim Ritzert, City Council ex-officio

Mark Prouty

Donna Colton

Sumner Crosby

Daphne Fuentevilla

Bob Heffernan

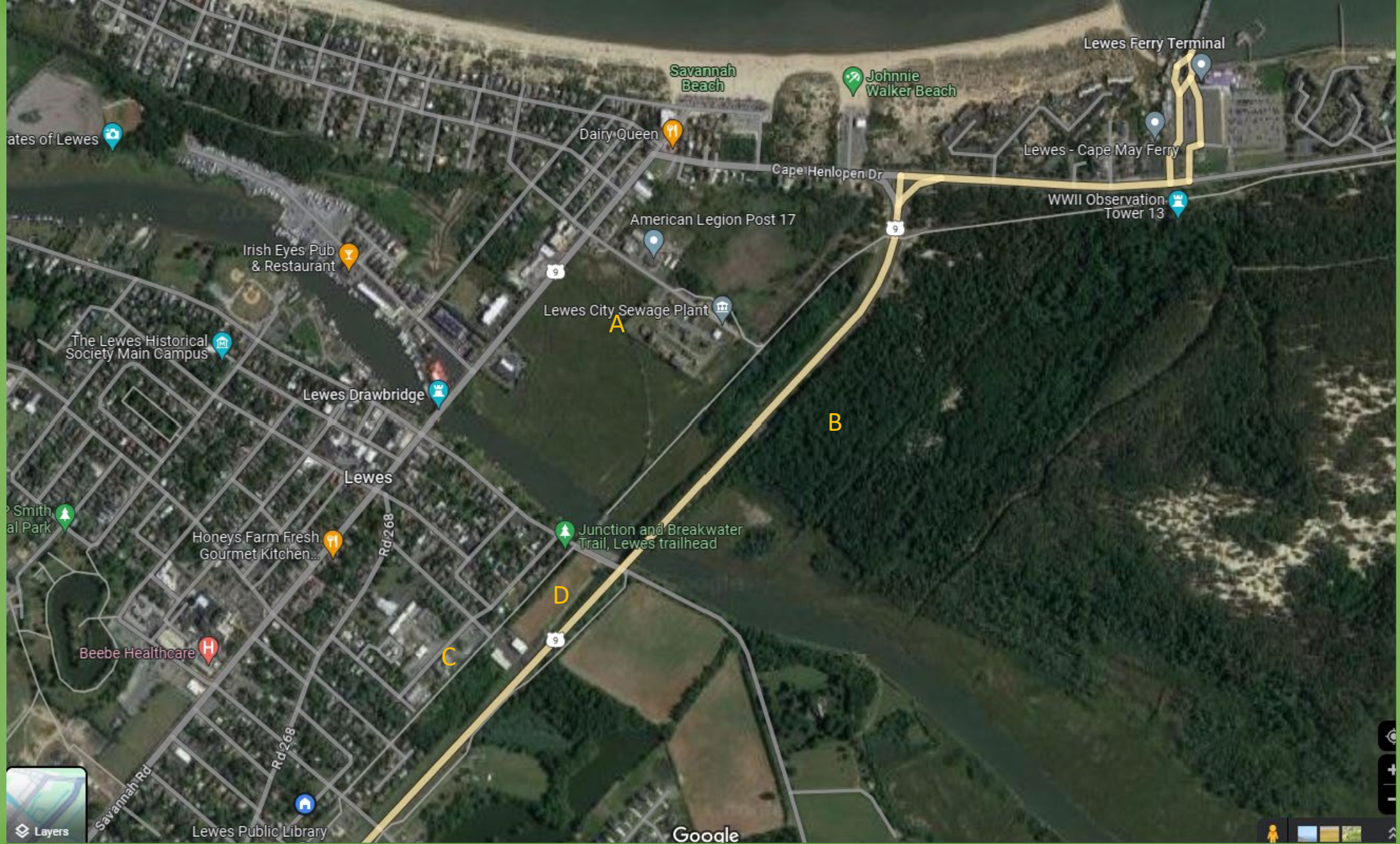
WWTP Contingency Committee

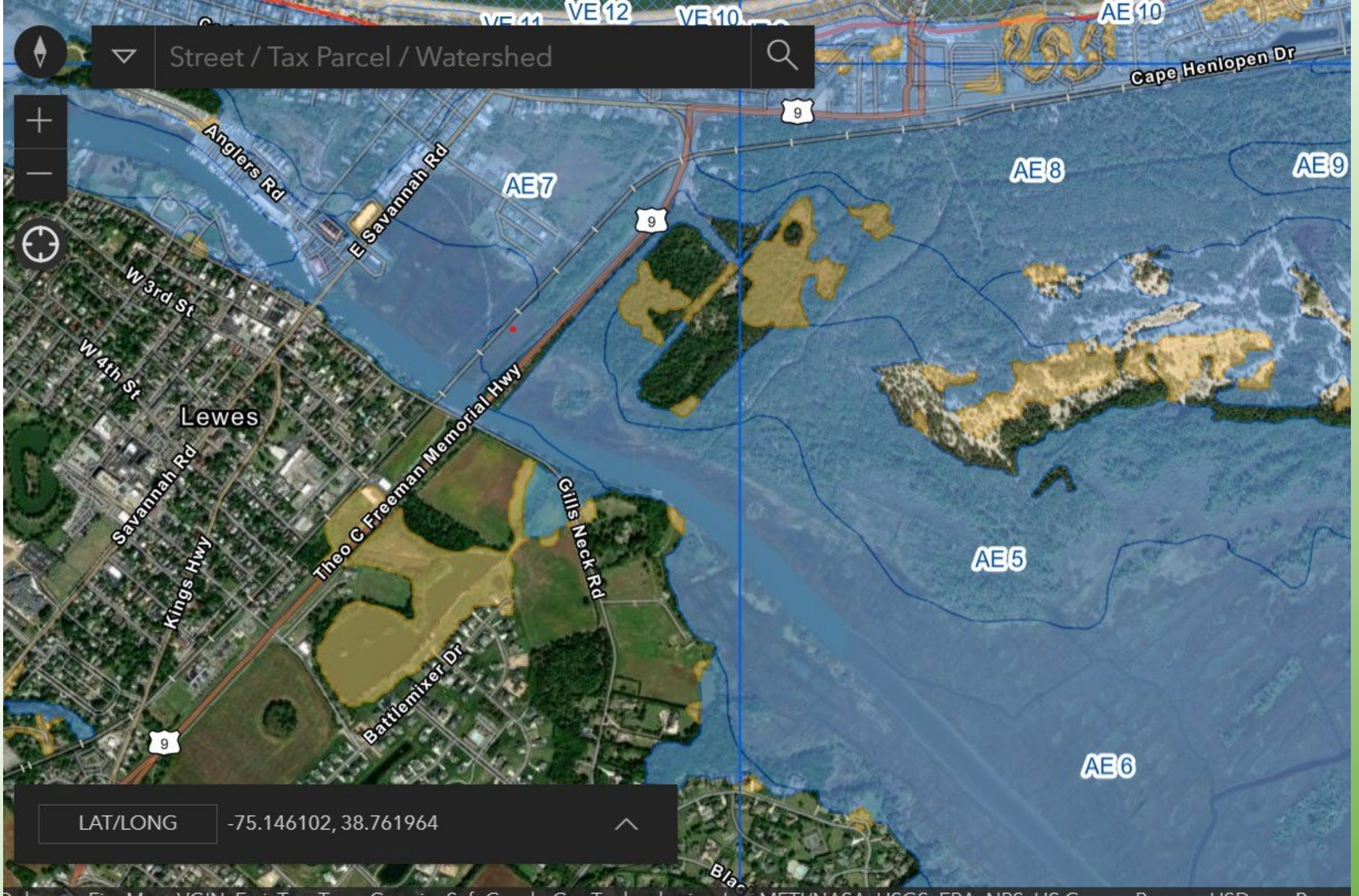
- Considered alternatives beyond those in the GHD study
- Explored different technologies
  - Webinars, visits, case studies, research, meetings, Q&As with engineers and operators for technologies of interest
- Explored alternate locations
  - Consulted UD experts
  - Elevation maps
- Discussions were as wide-ranging as possible

- The committee went as far as possible without spending any money

Meetings and Investigations

- Technologies considered: more sustainable + smaller footprint
  - **Sequencing Batch Reactors (SBR)**
    - Proven technology 30 years
  - **Aerobic Granular Sludge (AGS) "Nereda"**
    - 80+ operating plants world-wide
    - 2012 first operating municipal WWTP
- Presentations
  - Aqua-Aerobic Systems, Inc. - October meeting + several webinars + Q&As
- Tour of Berlin, MD - SBR WWTF
- Discussions with operators
  - Berlin WWTF
  - Riviera Utilities WWTF Alabama – 2020 startup
  - Whitefish WWTF Montana – 2021 startup
  - Wolcott WWTF Kansas – 2022 startup


Lewes Ferry Terminal
Savannah Beach
Johnnie Walker Beach
Dairy Queen
Lewes - Cape May Ferry
Cape Henlopen Dr
WWII Observation Tower 13
American Legion Post 17
Irish Eyes Pub & Restaurant
Lewes City Sewage Plant
A
The Lewes Historical Society Main Campus
Lewes Drawbridge
B
Lewes
Junction and Breakwater Trail, Lewes trailhead
Honeys Farm Fresh Gourmet Kitchen...
Rd 268
D
Beebe Healthcare
C
Rd 268
Savannah Rd
Lewes Public Library
Layers
Google


Street / Tax Parcel / Watershed
VE 12
VE 10
AE 10
Cape Henlopen Dr
9
Anglers Rd
E Savannah Rd
AE 7
AE 8
AE 9
W 3rd St
W 4th St
Lewes
Savannah Rd
Kings Hwy
Theo C Freeman Memorial Hwy
Gills Neck Rd
Battlemixer Dr
AE 5
AE 6
LAT/LONG
-75.146102, 38.761964

Options Evaluated

- New Option1: Harden the current site
  - Also considered discharge into wetlands “A” via spray irrigation
- New Option 2: Build nearby (Option 2b from GHD Study):
  - “B” State lands within Lewes border
    - Spray irrigation / solid-set sprinklers for discharge from plant

      - and / or-
    - Lease a 2-4 acre parcel above floodplain from the state
  - “C” BPW/City Schley Avenue property
  - “D” Empty parcel

Option 1, revised

- **Current WWTF site**
  - Effluent quality better than permit requires… cleaner than water in the canal
  - Membrane technology is expensive to operate
  - Other technologies can achieve same quality at lower cost and in smaller space
  - Elevate structures rather than dike the site
  - Provide emergency access via hiking trail off Freeman Highway

- **Site can be floodproofed**
  - Sufficient room to install new system safely, while current operations continue
  - Reuse some existing equipment
  - Both SBR and AGS have lower operating costs
  - AGS has lower capital and operating costs – energy, labor, & chemicals
  - Both are proven technologies

Option 1

	GHD	AQUA-AEROBIC SYSTEMS, INC.
TECHNOLOGY	Oxidation ditch, MBR expansion	Aerobic Granular Sludge, tertiary filters
CAPITAL	$18M	Estimated similar: Aqua-Aerobic cost ~$3M
O&M	$2M/year	$500K/year [$300K at 2-year-old AGS plant]
LAND	Existing site + wetlands	Existing site
HARDENING	Dike property, larger EQ tank, elevate roadway	AGS tanks 20-24'; elevate buildings and equipment; floodproof digester building
ACCESS	Elevate road over dike	Widen hiking trail, access via Freeman Hwy
LABOR	6 FTE	2 FTE [+ manager, per DNREC rules]
ENERGY USE	6500 kWhr/day	Estimated 50% lower
CHEMICALS	$1,000/day	$200/day

Option 2b, revised

- GHD: Classic activated sludge plant – 20 acres
- New: Aerobic granular sludge plant – 2-3 acres

- 3 possible sites within Lewes
- No need for lengthy pipe runs
- Safe unless/until Lewes is forced to retreat

Option 2

	GHD Option 2b	AQUA-AEROBIC SYSTEMS, INC. New Option 2b
TECHNOLOGY	Activated sludge + tertiary filtration	Aerobic Granular Sludge [AquaNereda] + Aqua-Disk filters
PROJECT CAPITAL COST	$91M	Estimated at $35-40M [$35M capital cost for 2 mgd WWTF 2021 in floodplain]
O&M COSTS	$1M+ /year	$300-$500K/year [$300K budget 2024 for 2-year-old plant]
LAND	20 acres	2-3 acres
LABOR	6 FTE	2 FTE [+ manager, per DNREC rules]
DISCHARGE	Canal	Canal [fixed-head irrigation would add labor]

Conclusions

The committee is pleased to report that Lewes has options

- Recommended next steps
  - Determine the costs, risks / benefits, and community views for the revised options
    - **Fund an engineering study for the new Options 1 and 2b**
    - **Review results of GHD study for new Option 3c**
  - Continue negotiations with Sussex County

- When costs and risks are understood, the Board will be able to make a more informed decision
- If Option 3 is pursued, urge AGS technology be investigated for Wolfe Neck

Next Up

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The Aerobic Granular Sludge Process

Wolcott, KS AGS