



WHAT A DIFFERENCE A STORMWATER MANUAL CAN MAKE

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Project Overview



Stormwater Requirements



Innisbrook Basin Results comparison



Takeaways

PROJECT OVERVIEW





PROJECT OVERVIEW – PINELLAS COUNTY

- Population = 960,000 (2020)
- Most densely populated county – 3491 residents/sq mi (2020)
- 23 Cities and Towns outside unincorporated Pinellas County
- Highest elevation 110'
- Project Location in North Pinellas County, Florida

PROJECT OVERVIEW – INNISBROOK PARCEL L

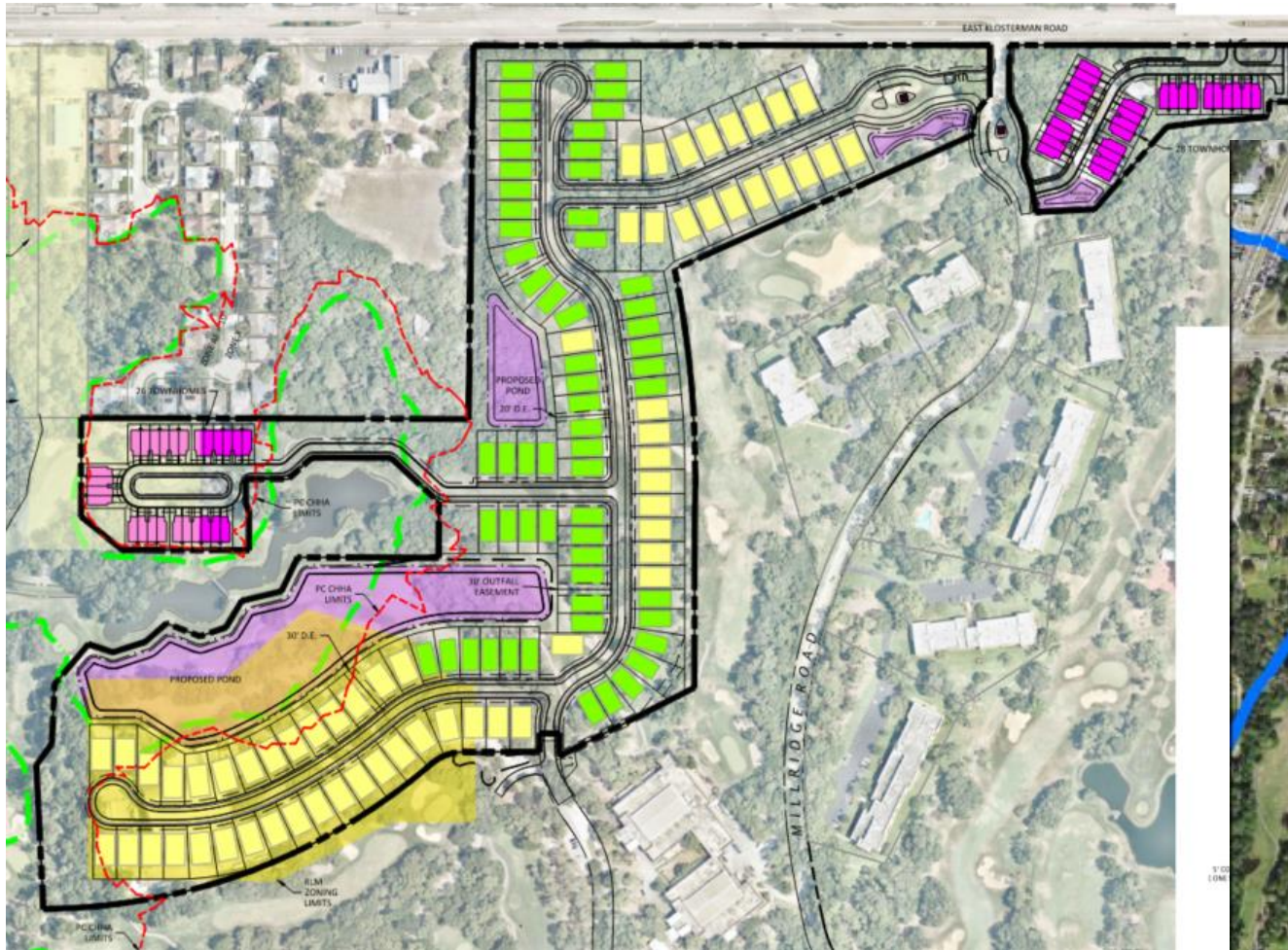
- 53.71 acres
- Existing site elevation 3' – 56'
- Proposed site elevation 3'- 45'



- Within existing Innisbrook Golf Resort

“Home of the Valspar”

PROJECT OVERVIEW – INNISBROOK PARCEL L



- Redevelop 9 holes of the North Course into 174 residential units

STORMWATER REQUIREMENTS





CITY OF TAMPA

Major City in county West of Pinellas

- Post development discharge in 25y, 24h storm reduced to 5y, 24h pre (rate) into existing roadway storm system
- OR
- Post development discharge post \leq pre
 - Wet pond treatment = 1" runoff from treatment area
 - Dry pond/underground chambers treatment = 0.5" runoff from treatment area
 - Recovery within 72 hours
 - Percolation allowed in attenuation analysis
 - Compensatory treatment allowed



PASCO COUNTY

Located immediately North of Pinellas

- Post development discharge (rate) post \leq pre
- Wet pond treatment = 1" runoff from treatment area
- Dry pond/underground chambers treatment = 0.5" runoff from treatment area
 - Recovery within 72 hours
- Percolation allowed in attenuation analysis
- Compensatory treatment allowed



SWFWMD

Southwest Florida Water Management District (State/Regional)

- Post development discharge (rate) post \leq pre
- Wet pond treatment = 1" runoff from treatment area (OFW add 0.5")
- Dry pond = 0.5" runoff from treatment area (OFW add 0.5")
- Dry pond/underground chambers treatment = 0.5" runoff from treatment area
 - Recovery within 72 hours
- Impaired waterbody – Net Improvement loading analysis
- Percolation allowed in attenuation analysis
- Compensatory treatment allowed

PINELLAS COUNTY

- Post development discharge (rate) post \leq pre
- Treatment requires loading analysis. Design must meet more stringent of
 - Reduce post-development TN by 55% and TP by 80%*
 - OR
 - Reduce post-development loading by 10% of pre-development loading*
- Percolation **not** allowed in attenuation analysis
- Compensatory treatment allowed within the watershed



INNISBROOK BASIN RESULT COMPARISON



STORMWATER CALCULATION COMPARISONS

BASIN POND SW55



BASIN POND SW55

- Area = 13.71 ac
- Location in Zone 4 (Clearwater) with annual rainfall of 51 inches.
- Depth to SHGW > 7'
- Infiltration rate 29 in/hr



BASIN POND SW55

EXISTING

- Land use = Golf Course
 - Avg scrubby flatwoods & single family residential
- DCIA = 0
- Non DCIA CN = 39

PROPOSED

- Land use = Single family residential
- DCIA = 31.62%
- Non DCIA CN = 39
- Dry Retention Pond

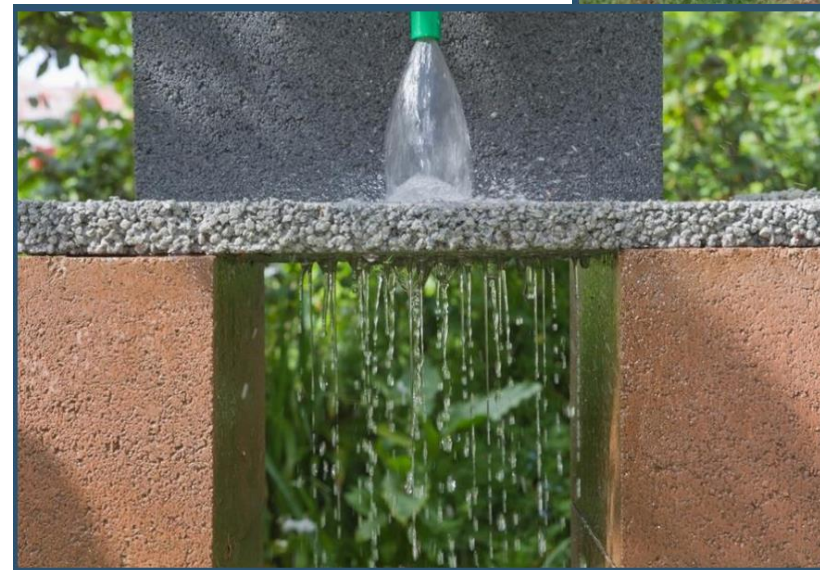
$\text{LOAD (kg/yr)} = \text{Area (ac)} * \text{annual runoff C} * \text{annual rainfall (in)} * \text{EMC}$

$\text{Removal Efficiency} = (1 - [\text{Pre load (kg/yr)} / \text{Post load (kg/yr)}]) * 100$

$\text{Overall Treatment Efficiency} = E1 + [1 - (1 - E1) * (1 - E2) * (1 - E3)]$

OPTIONS FOR LOAD REDUCTION

- Low Impact Design (LID)
 - Structural options are primarily for small catchments
 - Landscape-oriented retention basins & swales
 - Rain Gardens
 - Curb cuts
 - Biofiltration
 - Pervious walkways
 - Pervious pavement (can be used to reduce DCIA)
- Retention



OPTIONS FOR LOAD REDUCTION

- Reduce DCIA
 - *Volume of runoff reduced*
 - *Load reduced*



$$\text{LOAD (kg/yr)} = \text{Area (ac)} * \text{annual runoff C} * \text{annual rainfall (in)} * \text{EMC}$$

STORMWATER CALCULATION COMPARISONS

BASIN POND SW55

SWFWMD

- Treatment Volume = 0.57 ac-ft
 - 0.5" (dry retention)
- DHW elevations
 - 25yr, 24hr = 12.26'
 - 100yr, 24 hr = 13.15'
- Surface Discharge
 - 25yr, 24hr = 7.68 cfs
 - 100yr, 24 hr = 11.64 cfs
- Annual Load Discharged
 - **TN = 15.93 lb/yr**
 - **TP = 2.52 lb/yr**

Pinellas County

- Treatment Volume = 1.94 ac-ft
 - 1.7" (10% pre)
 - 0.6" (55/80 post reduction)
- DHW elevations
 - 25yr, 24hr = 13.81'
 - 100yr, 24 hr = 14.63'
- Surface Discharge
 - 25yr, 24hr = 6.77 cfs
 - 100yr, 24 hr = 13.02 cfs
- Annual Load Discharged
 - **TN = 2.85 lb/yr**
 - **TP = 0.45 lb/yr**

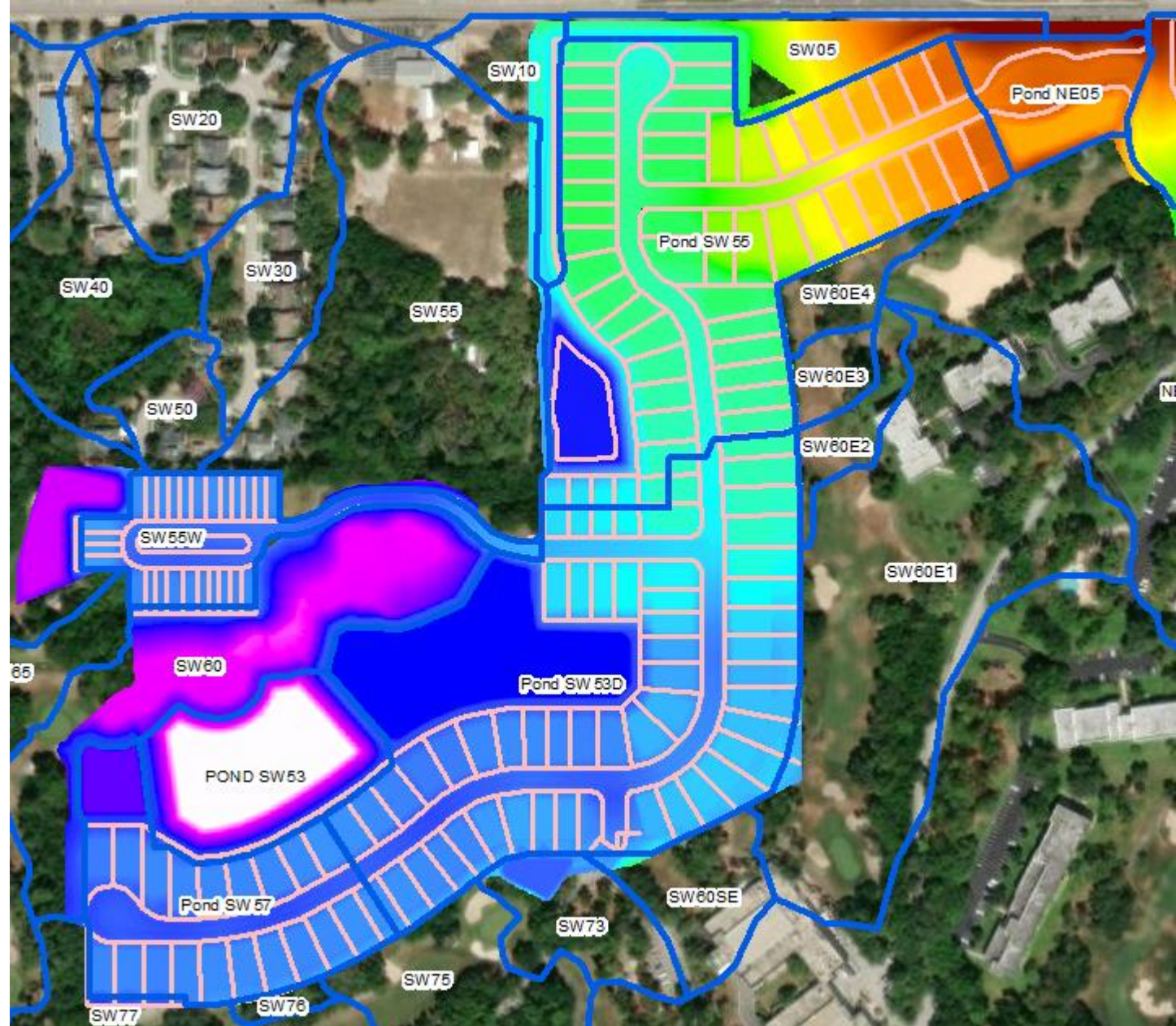
TAKE AWAYS



WHAT DOES THIS MEAN FOR THE SITE?

CONS

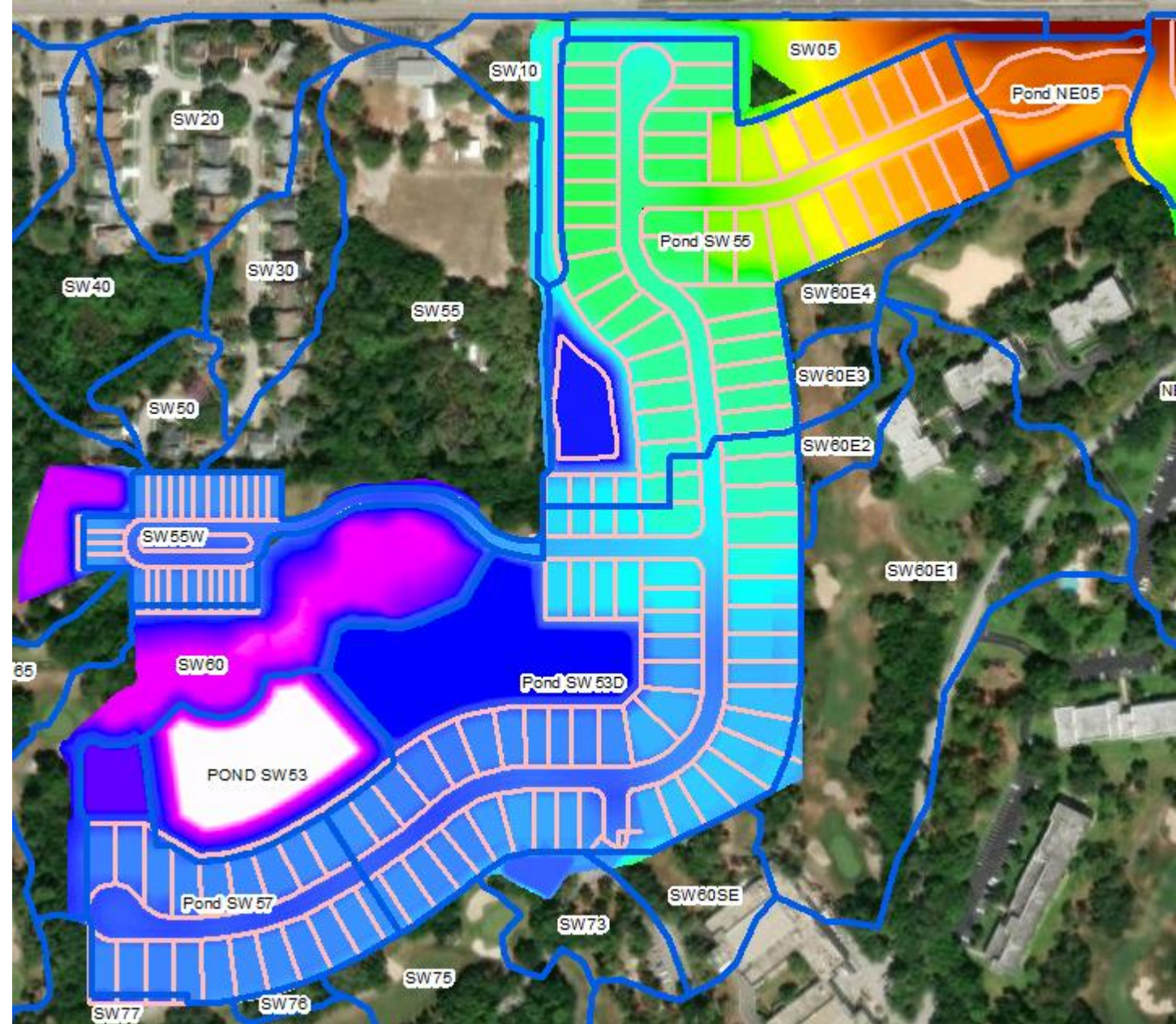
- Potential need for additional fill
 - Loss of lots to dig for fill
 - Additional trucking to import fill
- Loss of “premium” water lots
- Loss of number of lots for larger perc area
- More \$\$\$
- Potentially higher maintenance costs for residents



WHAT DOES THIS MEAN FOR THE SITE?

PROS

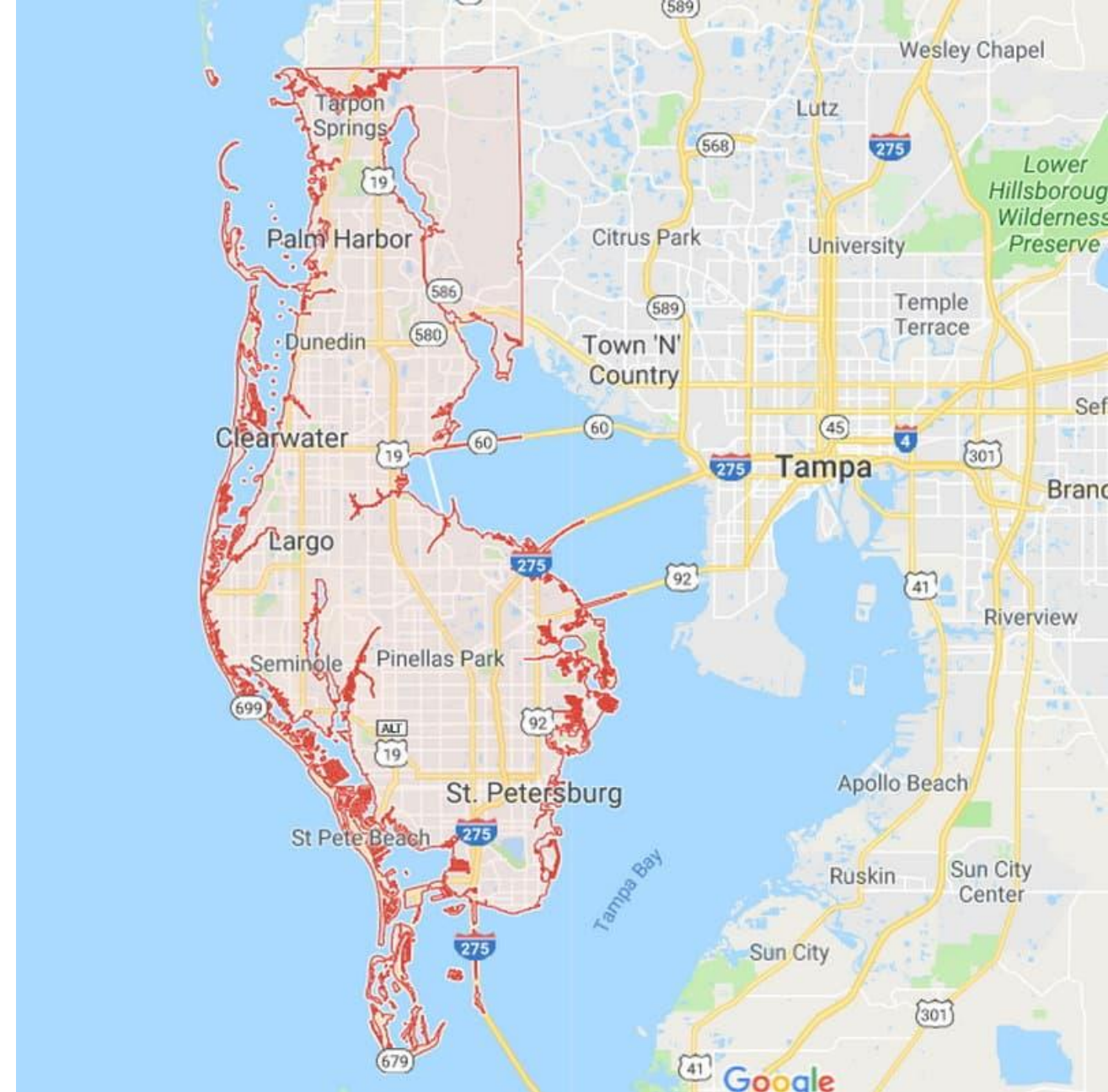
- Increased site resiliency
 - CHHA
 - *More floodplain compensation than encroachment*
- Lots of green space
- Opportunity for plantings and additional landscaping
- Potential reduced costs to residents if use Stormwater harvesting



WHAT DOES THIS MEAN FOR THE COMMUNITY?

PROS

- Meet or exceed terms of the MS4 permit, TMDL, BMAP
- Reduce costs for water quality improvement projects
- Improved water quality = improved quality of life
- Reduced water treatment costs
- Increases groundwater recharge

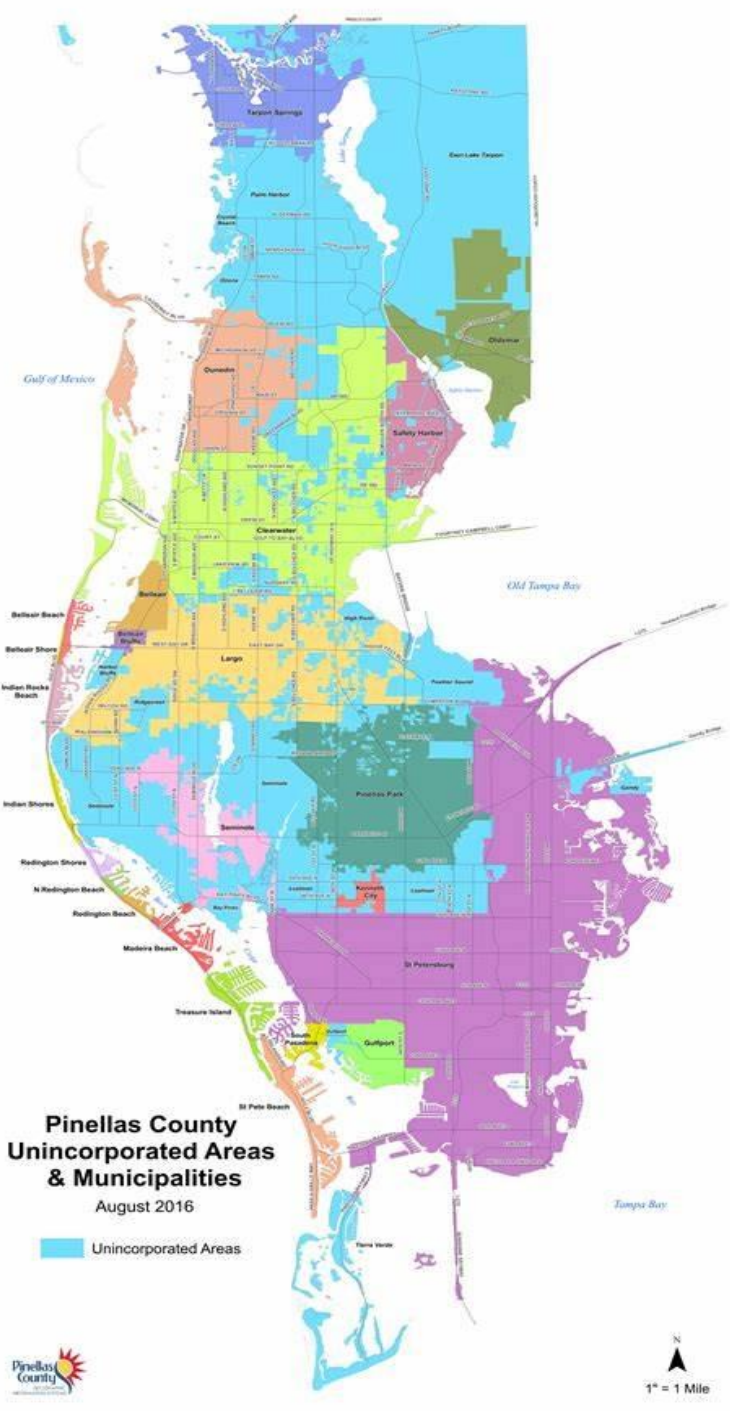




WHAT DOES THIS MEAN FOR THE COUNTY?

CONS

- Lower number of permit issuances
- Cost to purchase homes and businesses increases
- Tax revenue ???





PINELLAS COUNTY

STORMWATER MANUAL

ADOPTED FEBRUARY 1, 2017

REVISED NOVEMBER 1, 2021



SUMMARY

- Focus of a Stormwater Manual can make a big difference in every site design and help improve quality of life.
- Improved water quality design doesn't always mean lower discharge rates from the site.
- Decide what your priorities are.



QUESTIONS?

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