ENRAC – STORMWATER REGULATIONS

STORMWATER REGULATION MODIFICATIONS

Tadd Kasbeer, P.E.

ENRAC – STORMWATER

Stormwater Regulations - Local

County Minimum Standard stormwater requirements:

- All development within Volusia County (unincorp. or incorp.)
- Cities can tighten requirements but cannot relax requirements
- Water quality requirements very general
- Similar to requirements of State's attenuation requirements

Regulation of Water Quality (Treatment) and Attenuation (Flooding).

ENRAC – STORMWATER

Stormwater Regulations - Local

Stormwater requirements – Attenuation:

- Pre vs Post Rate of Discharge & Volume
  - Open Basin criteria: 25 yr / 24 hr storm
  - Closed Basin criteria: 100 yr / 24 hr storm
- Typical Methods: “Best Management Practices” – Retention or Detention

ENRAC – STORMWATER

Stormwater Regulations

Stormwater Rule Potential Modifications:

- Seasonal High ground water elevation
  - Require Geotech or Biologist to add safety factor to elevation
  - Require a minimum number of borings per area
- Curve Numbers
- Tailwater elevation

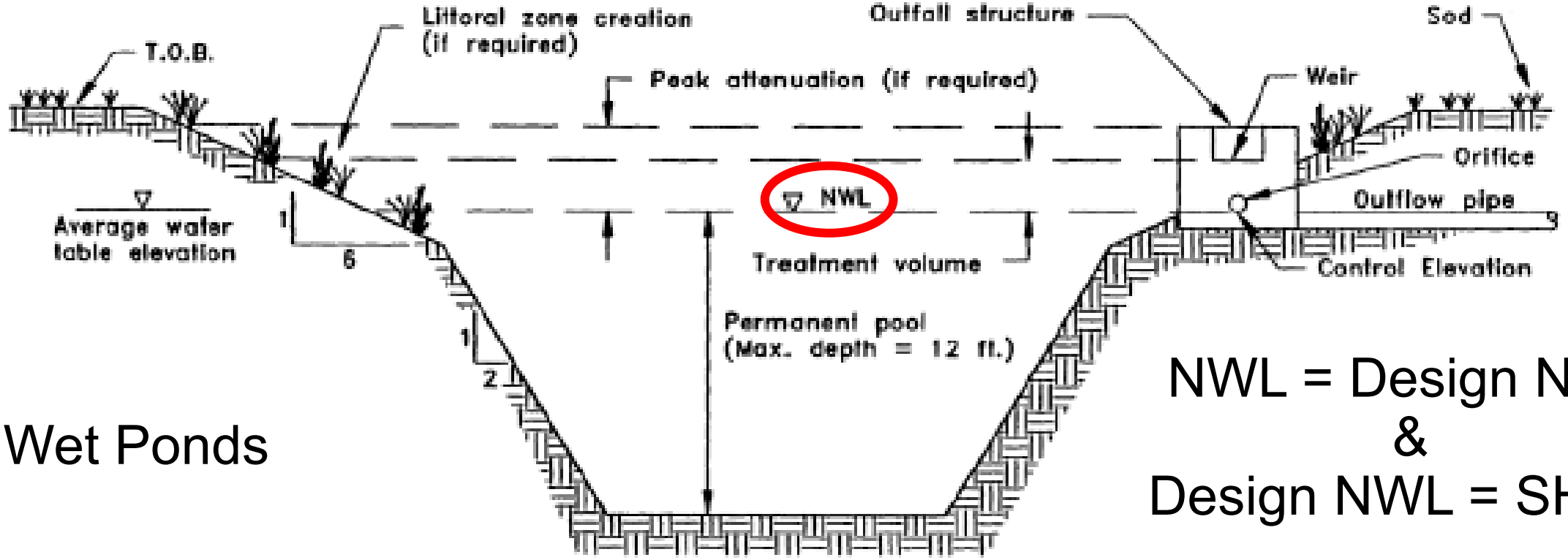
ENRAC – STORMWATER

Stormwater Regulations

Stormwater Rule Potential Modifications:

- Stormwater facilities (ponds) locations on site
- ~~Design storms~~
- ~~Frequency of storms/recovery~~
- *Redevelopment standards (to be developed in future)*

SHWL & Stormwater systems

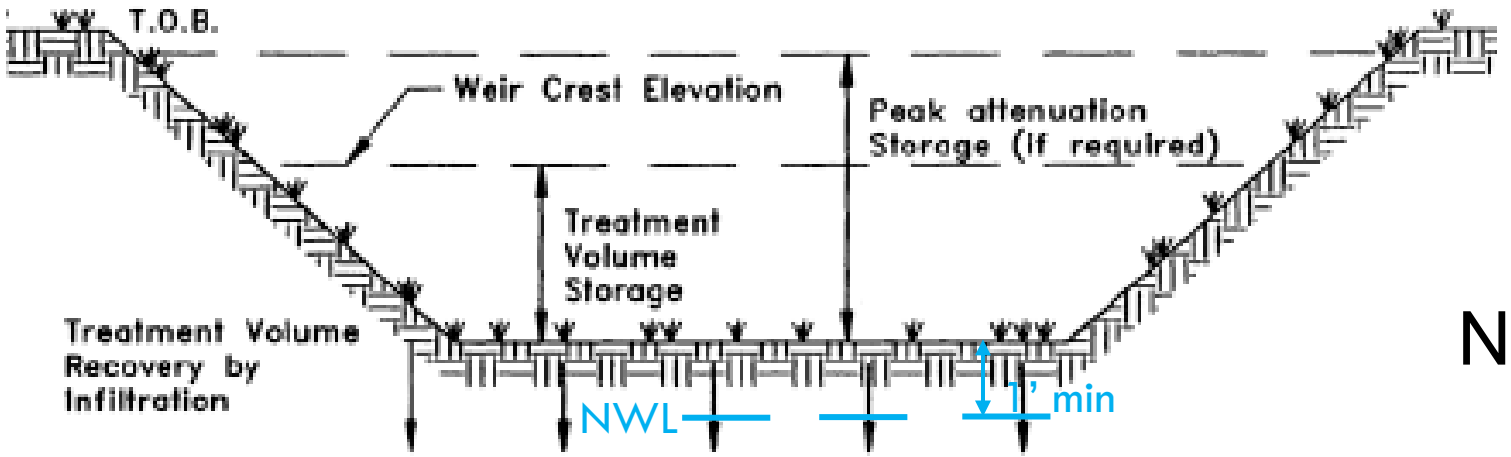


Wet Ponds

NWL = Design NWL
&
Design NWL = SHWL

SHWL & Stormwater systems

Dry Systems



NWL = Design NWL
&
Design NWL = SHWL

Volusia County
FLORIDA

ENRAC – STORMWATER

Proposed - SHWL

Sec. 72-779. - Performance, review and design standards.

(a) Performance Standards.

(1) For applications for a lesser or a standard development, the following performance standards shall be followed in the design of the project:

a. Stormwater runoff shall be subjected to best management practice prior to discharge into natural or artificial drainage systems. "Best management practice" shall mean a practice or combination of practices determined by the DRC to be the most effective, practical means of preventing or reducing the amount of pollution generated by the project to a level compatible with Florida water quality standards found in chapter 17-3, Florida Administrative Code. The design of any stormwater best management practice shall be based on the seasonal high-water elevation determined by either the project geotechnical engineer, if the seasonal high-water elevation is estimated to be below ground, or the project biologist, if the seasonal high water elevation is determined to be above ground. The design calculations for the selected stormwater best management practice shall use a design normal water elevation equal to the highest measured seasonal high-water elevation plus 6 inches.

Proposed - Borings

3. Information regarding the types of soils and groundwater conditions existing on the site, including a geotechnical investigation report signed by an engineer or geologist registered in the State of Florida and experienced in soils, hydrogeology and groundwater hydrology and an evaluation of seasonal high-water table elevations which contains:
    i. A representative number of soil boring profiles, but not less than a minimum of two soil borings per acre within the footprint of the final pond location;
    ii. Depth measurements to the water table for each soil boring profile;

Curve Number – Runoff Rate

Type	TR-55 Cover Type	Curve Number (TR – 55)			
		HSG A	HSG B	HSG C	HSG D
Assumed Impervious	Impervious Area	98	98	98	98
Sidewalk	Impervious Area	98	98	98	98
Road/Parking	Impervious Area	98	98	98	98
Building	Impervious Area	98	98	98	98
Other Asphalt/Concrete	Impervious Area	98	98	98	98
Dense Forest	Woods	36	60	73	79
Light Forest/Tree Canopy	Woods - Grass Combination	43	65	79	82
Brush/Bush	Brush	35	56	70	77
Open Space (Lawn)	Open Space	49	69	79	84
Gravel	Streets & Roads - Gravel	76	85	89	91
Light Bush/Dirt/Mulch	Open Space - Poor Condition	68	79	86	89
Dirt	Streets & Roads - Dirt	72	82	87	89

"A" Soils = sandy, well drained soils

"D" Soils = clayey, heavily saturated soils with organics

What would the number be for wetlands?

Curve Numbers – Runoff Rate

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Initial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
18*: Daytona	B	None	---	---	3.5-5.0	Apparent	Jul-Nov	>60	---	---	---	Moderate	High.
Urban land.													
19--- Deland	A	None	---	---	>6.0	---	---	>60	---	---	---	Low	High.
20--- EauGallie	B/D	None	---	---	0-1.0	Apparent	Jun-Feb	>60	---	---	---	High	Moderate.
21--- EauGallie**	B/D	None	---	---	+1-1.0	Apparent	Jun-Sep	>60	---	---	---	High	Moderate.
22--- Electra	C	None	---	---	2.0-3.5	Apparent	Jul-Oct	>60	---	---	---	Low	High.
23--- Farmton	D	None	---	---	0-1.0	Apparent	Jun-Oct	>60	---	---	---	High	High.
24* Fluvaquents													
25--- Gator**	D	Frequent	Very long	Jun-Apr	+1-0	Apparent	Jun-Mar	>60	---	2-6	20-28	High	High.
26--- Holopaw	B/D	None	---	---	0-1.0	Apparent	Jun-Nov	>60	---	---	---	High	Moderate.
27--- Hontoon**	A/D	None	---	---	+2-1.0	Apparent	Jan-Dec	>60	---	4-8	>52	High	High.
28* Hydraquents													

VOLUSIA COUNTY, FLORIDA



Volusia County
FLORIDA

ENRAC – STORMWATER

Proposed – Curve Number & Tail Water El.

b. *Runoff computations.* Runoff computations shall be based on the most critical situation (rainfall duration, distribution and antecedent soil moisture condition) and conform to acceptable engineering practices using rainfall data and other local information applicable to the affected area. The tailwater elevation used in the design of the stormwater best management practice is to be based on a County approved basin study. If a basin study has not been conducted and approved by the County than prior to preparing the stormwater best management practice design for the project, the engineer of record shall be responsible for coordinating with County Engineering staff to review and approve the tailwater information to be used in the calculations. Non-study based tailwater conditions are to surveyed by a licensed surveyor. For the purposes of calculating the pre-development runoff for undeveloped property with multi-designation soils types, e.g. A/D or B/D soils, the curve number shall be based on the highest percolation rate soil, A or B, unless the project geotechnical engineer can prove to the satisfaction of the CDE that the curve number should be based on the lower percolating condition.

ENRAC – STORMWATER PRIMER

Hampton Inn

Proposed Modifications – Location

and, where feasible, an upland buffer of native trees, shrubs and *under story vegetation in accordance with St. John's River Water Management District requirements.* Stormwater ponds should be located internal to the project if possible. If a stormwater pond is located adjacent to a perimeter property line and any portion of the adjacent property is lower than 1' below the top of bank of the stormwater pond then the CDE may require a clay core, or similar device, to eliminate or reduce to historic levels the groundwater flow from the stormwater pond to the adjacent property.

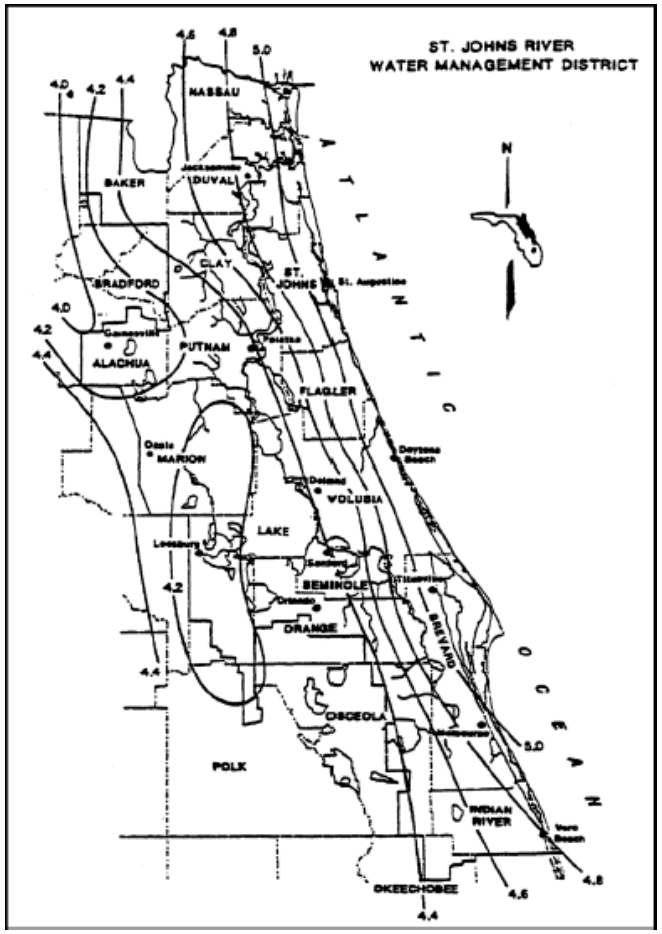
ENRAC – STORMWATER

Stormwater Runoff – Rainfall

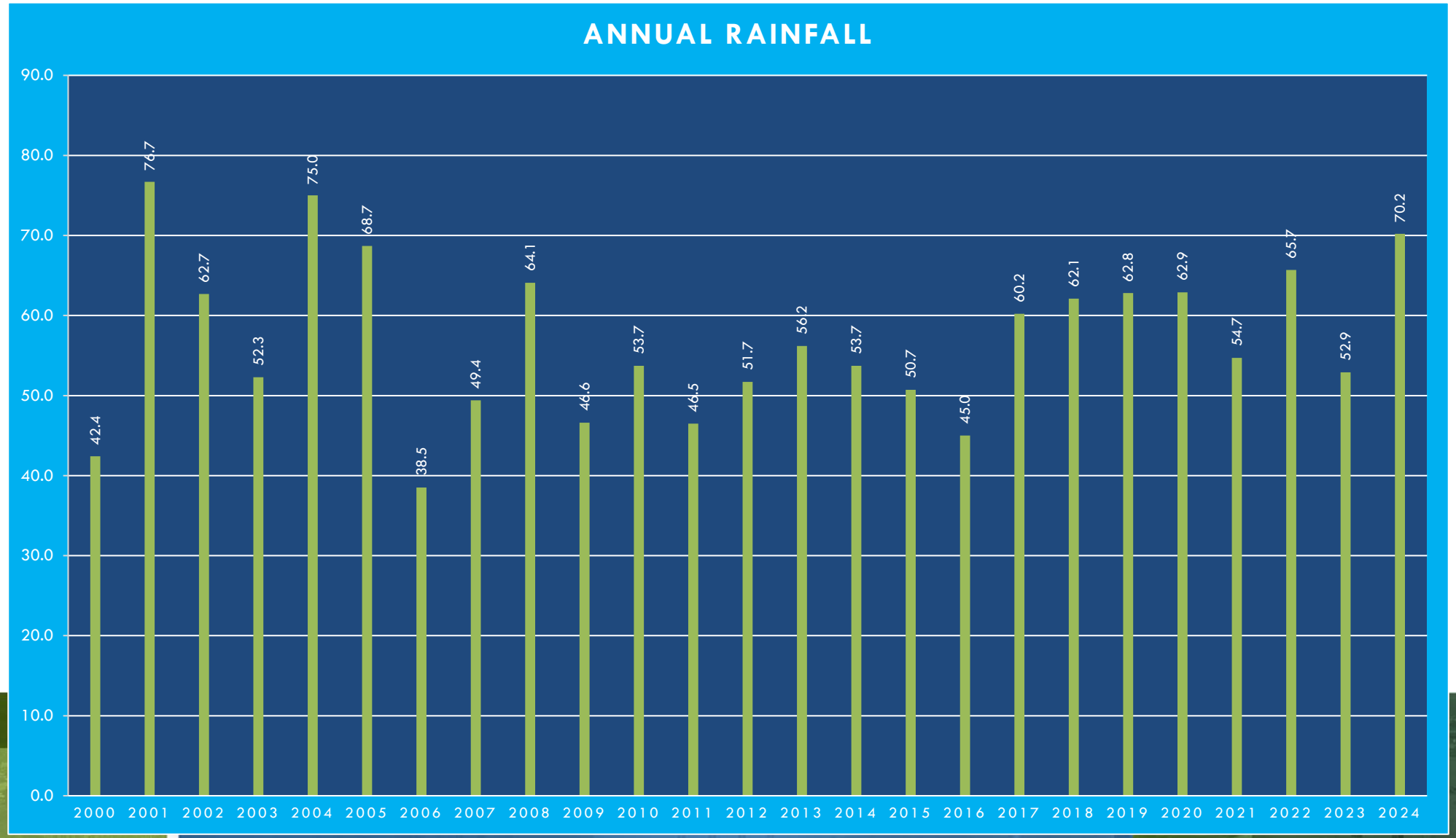
Depending on basin there are different storm sizes/rainfall amounts:

- Open Basin – 25 year/24 hour (8.1 in.)
- Closed Basin – 25 year/96 hour (11.3 in)

*http://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=fl



ENRAC – STORMWATER



Volusia County
FLORIDA

ENRAC – STORMWATER

Flooding Factors

- Storm Intensification
  - Between 1900-2000: **2** 11”+ (100 year+ storms)
  - Between 2000-2024: **4** 11”+ (100 year+ storms)

- Stormwater System Failures
  - South DeLand Publix and Freedom Elementary pond failures
  - Venetian Bay seasonal high