

Florida Department of Environmental Protection (FDEP)  
Technical Advisory Committee (T.A.C.) on...

# STATE-WIDE STORMWATER TREATMENT RULE DEVELOPMENT

AN ISSUES PRESENTATION BY  
**DEVO SEEREERAM, PH.D., P.E**  
DEVO ENGINEERING, ORLANDO, FL  
([WWW.DEVOENG.COM](http://WWW.DEVOENG.COM))  
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**SOME PRACTICAL IMPLICATIONS OF THE IMPLEMENTATION  
OF PROPOSED DRAFT STATE-WIDE STORMWATER TREATMENT RULE**  
These Are Only Advisory Comments to the T.A.C. & Rule-Making Staff  
“food for thought”

- 1. OUTLINE SOME QUESTIONS & CONCERNS WITH THE PROPOSED METHODOLOGY USED AS THE BASIS FOR FIGURING OUT THE REQUIRED TREATMENT VOLUME (TRUENESS OF THE CONTINUOUS SIMULATION & ACCEPTANCE OF THE P & N CONCENTRATIONS)**
- 2. WET DETENTION PONDS, IMPACT ON SIZE & TYPES OF TREATMENT PONDS (TREATMENT TRAIN) - PINE FLATWOOD SITES WITH HIGH WATER TABLE; LAND SPACE ALLOCATION FOR PONDS; COST IMPLICATIONS**
- 3. DRY RETENTION PONDS & BIOFILTRATION (AKA UNDERDRAIN) PONDS - GEOTECHNICAL PRECAUTIONS REGARDING SOIL AMENDMENTS, ETC.**

**SOME PRACTICAL IMPLICATIONS OF THE IMPLEMENTATION  
OF PROPOSED DRAFT STATE-WIDE STORMWATER TREATMENT RULE  
(CONTINUED)**

- 4. SINKHOLES IN PONDS - A SUGGESTED APPROACH**
- 5. PRACTICALITY OF SOME OF THE LOW IMPACT DESIGN (LIDS)**
- 6. MISCELLANEOUS ISSUES**

## 1. QUESTIONS ABOUT THE HARPER METHODOLOGY

- **WHY IS THE FIRST FLUSH CONCEPT NOT VALID ANYMORE? IT SEEMED INTUITIVE TO SAY THAT THE FIRST 1 INCH OF RAINFALL CARRIES OFF THE BULK OF THE POLLUTANTS & THAT LOAD SHOULD CARRY A HIGHER CONCENTRATION OF POLLUTANTS IN THE CONTINUOUS SIMULATION ANALYSIS? IN OTHER WORDS, FOR A 1.5 INCH RAINFALL EVENT, THE RAINFALL FROM 1.0 TO 1.5 INCH WILL CARRY LESS POLLUTANTS.**
- **IS THERE ENOUGH FLORIDA-BASED MEASURED DATA ON THE NITROGEN & PHOSPHORUS LOADING RATES TO SUPPORT THESE CALCS?**
- **50% RECOVERY IN 24 HR, 100% IN 72 HRS, WHEN WE REQUIRE 3" RETENTION, IS THIS NOT TOO FAST FOR 72 HR RECOVERY? WHEN WE DO RUNOFF FROM DCIA FOR RECHARGE CRITERIA, WE USUALLY SPECIFY A LONGER RETENTION TIME. WE SHOULD SAY RECOVERY AT A RATE OF 0.5 INCH PER 24 HR?, SO A 3 INCH RETENTION RECOVERS IN 6 DAYS?**

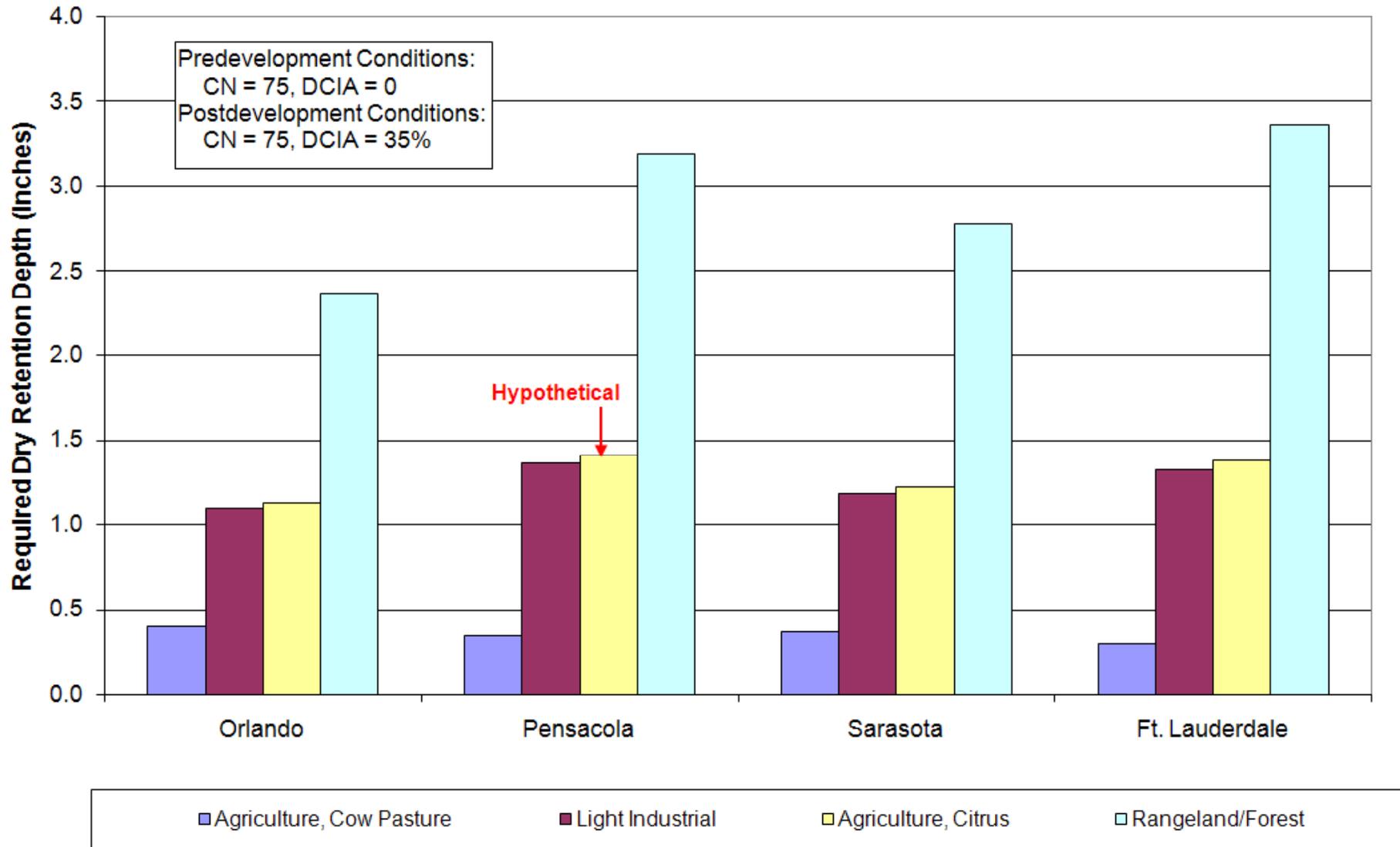
## 1. QUESTIONS ABOUT THE HARPER METHODOLOGY (CONTINUED)

- CONTINUOUS SIMULATION MODELING FOR DEVELOPMENT OF THE CURVES DOES NOT TAKE INTO ACCOUNT THE FASTER INFILTRATION RATE OUTSIDE THE 3 TO 4 WEEK PEAK WET SEASON WINDOW? THE TYPICAL 72 HR/100% DRY RETENTION RECOVERY CRITERIA APPLIES TO A WET SEASON WATER TABLE AMBIENT CONDITION WHICH APPLIES FOR LESS THAN 10% OF THE YEAR. THE SIMULATION MAY NOT BE TRULY CONTINUOUS SIMULATION SINCE IT DOES NOT ACCOUNT FOR FLUCTUATION OF THE WATER TABLE DURING THE COURSE OF THE YEAR AND THE FASTER RECOVERY TIMES OUTSIDE OF THE WET SEASON WATER TABLE WINDOW.
- WILL THIS BE SUBJECT TO CRITICISM FROM THE COMMUNITY? SHOULD WE NOT LEAVE ROOM FOR TRUE CONTINUOUS MODELING? WHICH INCLUDE ALL LOSSES INCLUDING EVAPORATION, ENHANCED INFILTRATION OUTSIDE THE SMALL WINDOW OF THE WET SEASON PEAK?

## 1. QUESTIONS ABOUT THE HARPER METHODOLOGY (CONTINUED)

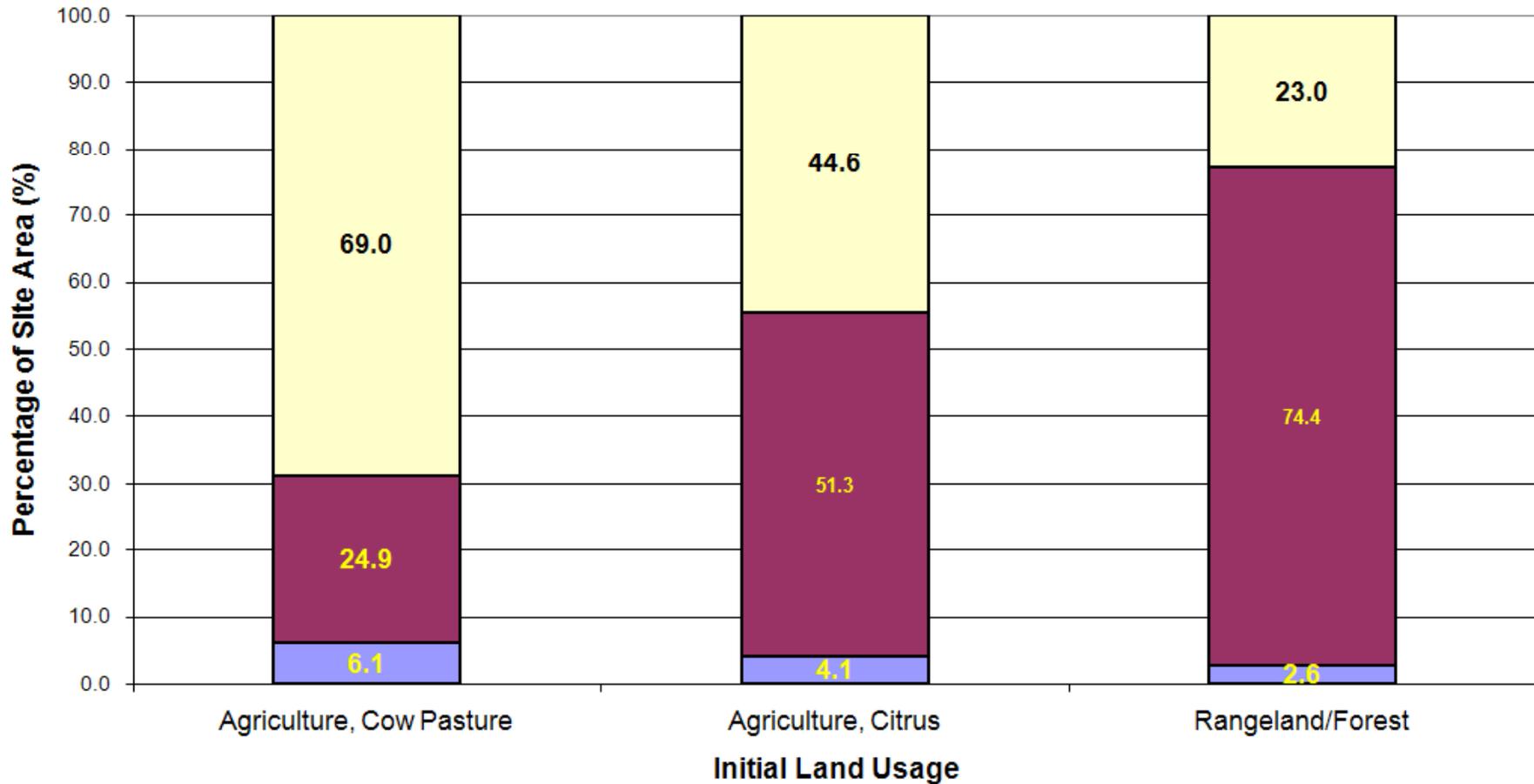
- LAKES ARE INCREASING IN N & P BUT HAVE WE OVERLOOKED THE NON-STORMWATER CONTRIBUTIONS AND PERHAPS PLACED AN UNFAIR BURDEN ON STORMWATER TREATMENT?
- A BIG CULPRIT IS OVER-SPRAY OF PUBLIC ACCESS RECLAIMED WATER (TYPICALLY LADEN WITH N & P) WHICH EVENTUALLY ENTERS STORM SEWER. SHOULD WE NOT RESERVE THIS FOR LARGE GREEN AREAS WHERE OVER-SPRAY WILL BE MINIMUM INSTEAD OF NARROW LANDSCAPE BOULEVARDS? THIS IS A CONSTANT HEAVY LOAD. I SEE IT EVERY DAY IN ORLANDO.
- SEPTIC DRAINFIELD LOADING & WWTF PERCOLATION PONDS.
- OF COURSE, AGRICULTURAL & DAIRY LAND.

## Required Dry Retention Depths to Convert from Various Existing Land Uses to Single Family Development



## Hypothetical Wet Pond Only

### Required Pond Size and Developable Area for Conversion from Various Initial Land Usage to Single Family Development for Orlando

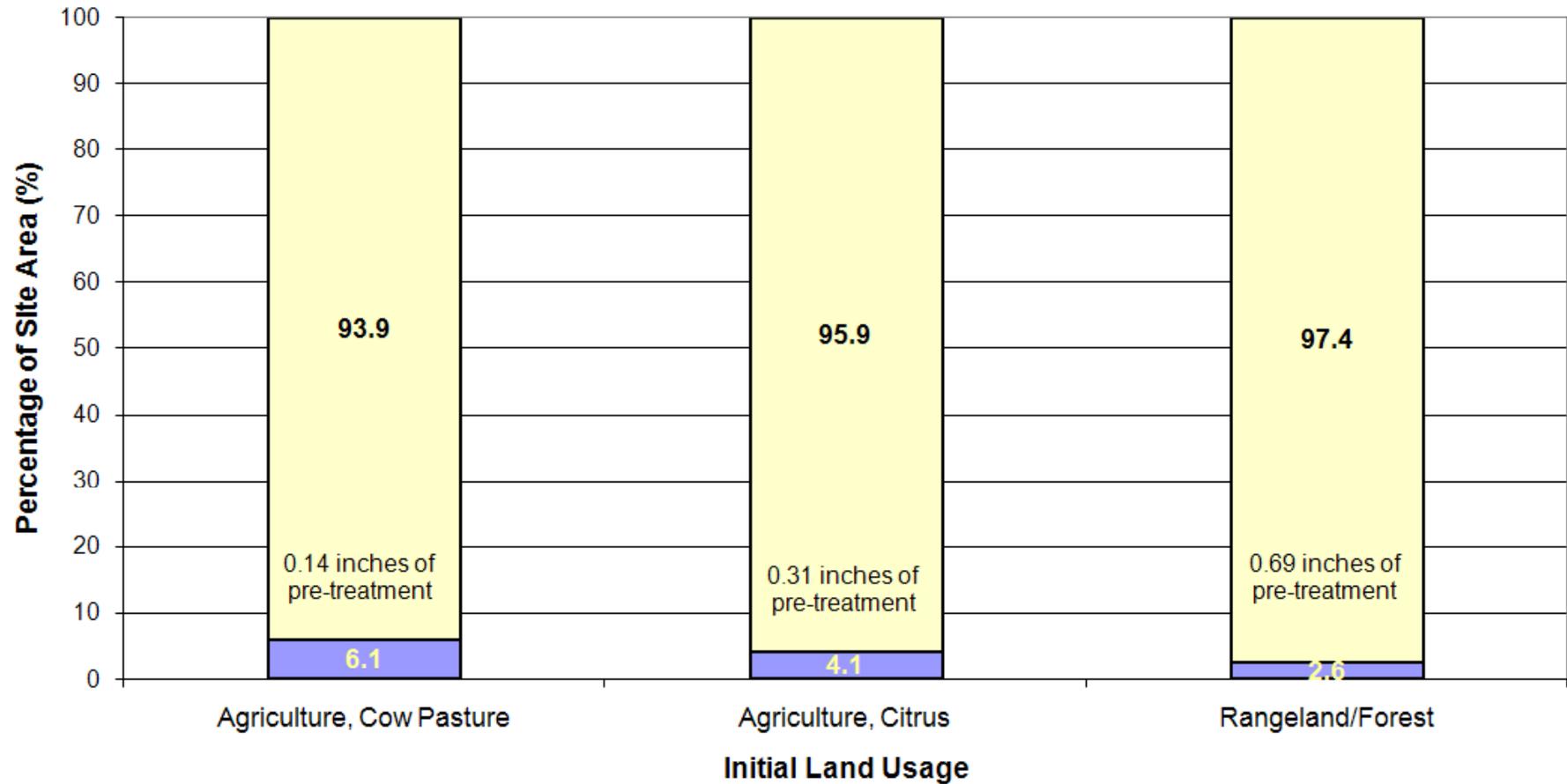


- Active Pond
- Dead Pond, aka Set Aside Land
- Single Family Development

Predevelopment Conditions: CN = 75, DCIA = 0  
 Postdevelopment Conditions: CN = 75, DCIA = 35%

## Dry/Wet Treatment Train

Required Wet Pond Size and Developable Area for Conversion from Various Initial Land Usage to Single Family Development for Orlando



■ Wet Pond □ Single Family Development

Predevelopment Conditions: CN = 75, DCIA = 0  
Postdevelopment Conditions: CN = 75, DCIA = 35%

## 2. WET DETENTION PONDS

- THESE ARE THE MOST USED TYPE OF TREATMENT SYSTEMS IN PINE FLATWOODS WHICH DOMINATE LARGE PARTS OF THE FLORIDA LANDSCAPE (WATER TABLE WITHIN 24 INCHES OF LAND SURFACE).
- STORMWATER IRRIGATION REUSE FOR BLEED-DOWN WILL NOW BE RIGHTFULLY ENCOURAGED, BUT....
- IS THIS NOT A “PUMPED” DISCHARGE THAT IS FROWNED UPON BY THE REGULATORY AGENCIES FOR HOMEOWNER ASSOCIATION (HOA) CONTROLLED FACILITIES? ARE THE AGENCIES GOING TO CHANGE THEIR POLICY ON ALLOWING PUMPED SYSTEMS TO BE MAINTAINED BY HOAs? TYPICALLY SOME TREATMENT IS REQUIRED IF IRON CONTENT IS TOO HIGH - MAJOR STAINING?

## 2. WET DETENTION PONDS (CONTINUED)

- ◉ **WHERE POSSIBLE, SHOULD THE BLEED-DOWN DISCHARGE NOT BE SENT TO RECLAIMED FACILITY THROUGH SANITARY SEWER (FOR EXAMPLE, APRICOT)? THIS SHOULD BE CONSIDERED WHEN TIE-IN TO IRRIGATION SYSTEM NOT FEASIBLE.**
- ◉ **SFWMD CURRENTLY RESTRICTS PUMPING FROM STORMWATER PONDS TO 55% OF PERMITTED ALLOCATION DURING DROUGHTS WHEN THE DESTINATION FOR THE IRRIGATION WATER IS A GOLF COURSE. THIS CONSTRAINT NEEDS TO BE LIFTED WHERE STORMWATER TREATMENT IS PART OF THE PROCESS.**
- ◉ **THE PROPOSED CALCULATION METHOD SHOWS THAT CONVENTIONAL WET DETENTION (UNLIKE DRY RETENTION) IS NOT GOING TO WORK ALONE TO REDUCE NITRATES EFFECTIVELY, SO IT WILL HAVE TO BE USED IN CONJUNCTION WITH STORMWATER REUSE, DRY PONDS, SOURCE CONTROLS, ETC.**

## 2. WET DETENTION PONDS (CONTINUED)

- LOGICAL TREATMENT TRAIN COMPONENTS FOR WET DETENTION: BIOFILTRATION POND (UPHILL OR DOWNHILL OF WET POND?), PERVIOUS CONCRETE, EXFILTRATION TRENCHES UNDER THE PAVEMENT?
- WHY IS THE 12 FT POND DEPTH RESTRICTION STILL IN THE DRAFT RULE?
- KEY PARAMETER FOR WET DETENTION TREATMENT CALCS HAS BECOME RESIDENCE TIME & AS WE WILL SHOW WITH THE COMPUTER MODEL, A WET POND WILL NOT WORK EVEN WITH MORE THAN A 100 DAYS OF RESIDENCE TIME.

### 3. DRY RETENTION PONDS

- DRY RETENTION SYSTEMS WILL INCLUDE CONVENTIONAL DRY PONDS, BIOFILTRATION PONDS, SWALES, & EXFILTRATION TRENCHES.
- BIOFILTRATION POND (A.K.A. UNDERDRAIN POND) & DRY RETENTION SHOULD STAY EQUIVALENT IN TERMS OF LEVEL OF TREATMENT. NOTE THAT THE BIOFILTRATION/UNDERDRAIN POND HAS BEEN IN THE SJRWMD RULE FOR SOME TIME BUT THE OTHER WMD'S HAVE NOT USED IT AS A BMP.
- THE BIOFILTRATION POND (AKA UNDERDRAIN POND) MUST STAY IN THE RULES AS SOME WET SITES WILL NOT WORK WITHOUT THEM NOW. WE NEED TO SUGGEST A UNIFIED METHOD FOR SLOWING DOWN BASEFLOW INTO THE UNDERDRAIN BED - SOIL LINERS, ETC.

### 3. DRY RETENTION PONDS (CONTINUED)

- **ADDING SOME BLENDED ORGANIC SOIL AMENDMENT (NOTE THAT THE CARBON SOURCE MUST BE RENEWED) TO REMOVE NITRATES (SUCH AS SAWDUST OR MUCKY SOILS) MIGHT WORK IF PROPERLY DONE BUT I SEE THIS AS ALSO BECOMING A QUALITY CONTROL ISSUE, THIS SHOULD BE FOCUS UNDER SLOWLY LOADED SYSTEMS LIKE SEPTIC DRAINFIELDS WHERE THE CONTRACTORS ARE CERTIFIED. BETTER TO REGULATE THE MAXIMUM SOIL PERMEABILITY (20 FT/DAY?). FROM EXPERIENCE, ASKING A CONTRACTOR TO AMEND SOIL IN A DRY POND IS A RECIPE FOR DISASTER. POND FAILURE WILL INCREASE.**
- **THERE IS SOME DISCUSSION ABOUT SLOWING DOWN RATE OF INFILTRATION IN DRY BOTTOM PONDS [ 50% IN 24 HRS AND 100% IN 72 HRS] USING SOIL AMENDMENTS TO REDUCE PERMEABILITY. THIS IS A RECIPE FOR DISASTER BECAUSE CONTRACTORS ARE NOT GOING TO BE ABLE TO MIX SOILS ONSITE WITH ANY PRECISION TO ACHIEVE THE OBJECTIVES OF SLOWER PERMEABILITY.**

### 3. DRY RETENTION PONDS (CONTINUED)

- **SWALES - ALL MUST UNDERSTAND THAT MUNICIPAL AGENCIES DON'T LIKE THESE BECAUSE OF MAINTENANCE ISSUES AND NUISANCE LOCALIZED FLOODING. FROM A MAINTENANCE STANDPOINT, THEY PREFER CURB & GUTTER. RESIDENTS DON'T UNDERSTAND THEIR FUNCTION AND THE DRIVEWAY CROSSINGS BECOME PROBLEMATIC OVER TIME.**
- **SWFWMD USES THE WATER QUALITY IN THEIR WATER QUANTITY CALCS (STAGE AFTER 36 HR RECOVERY FOR INITIAL STAGE IN ROUTING) SO THIS NEEDS TO BE RECONCILED WHEN THE NEW WATER QUALITY VOLUME SPIKES.**

## 4. SINKHOLE REPAIR IN KARST SENSITIVE AREAS

1. AS A PRACTICING GEOTECHNICAL ENGINEER, THERE IS NO WAY TO PREDICT FOR CERTAIN IF SINKHOLES ARE GOING TO DROP OUT IN STORMWATER PONDS.
2. BASED ON EXPERIENCE, THE FOLLOWING IS RECOMMENDED AS A REACTIVE APPROACH AS OPPOSED TO A POTENTIALLY WASTEFUL PROACTIVE APPROACH.
3. DURING PERMITTING, THIS IS WHAT NEEDS TO BE IDENTIFIED
  - A. IS THIS POND WITHIN A PART OF THE STATE WHERE THERE IS A HIGH POTENTIAL FOR SINKHOLE DEVELOPMENT? MAPS EXIST ALREADY TO IDENTIFY THESE AREAS - WMD STAFF ALSO KNOWS BASED ON EXPERIENCE.
  - B. IS THE POND SITE WITHIN AN AREA OF HIGH POTENTIAL FOR SINKHOLE DEVELOPMENT BASED ON THE SITE-SPECIFIC GEOTECHNICAL INDICATORS? AND LOCAL EXPERIENCE?

## 4. SINKHOLE REPAIR IN KARST SENSITIVE AREAS (CONTINUED)

C. IS THIS POND WITHIN A PART OF THE STATE WHERE THERE IS A HIGH POTENTIAL FOR SINKHOLE DEVELOPMENT? MAPS EXIST ALREADY TO IDENTIFY THESE AREAS - WMD STAFF ALSO KNOWS BASED ON EXPERIENCE.

- DRAWING & SPECS INDICATING HOW A TYPICAL SINKHOLE WILL BE REPAIRED
- TIME FRAME FOR REPORTING & FIXING THE SINKHOLE. 1 WEEK?
- SUBMISSION OF A COMPLETION REPORT TO THE DISTRICT.

4. DO WE WANT TO PRESERVE THE LEAKINESS IN THESE FEATURES USING 3' OF SLOWLY PERMEABLE NATURAL SAND?. THERE ARE BACKFILL SPECS AT OUR WEBSITE.

## 5. LOW IMPACT DESIGN (LID)

- DO WE HONESTLY BELIEVE THESE ARE PRACTICAL OR ARE THEY JUST EXOTIC IDEAS WITH VERY LIMITED APPLICATION: GREEN ROOFS/ IRRIGATION SYSTEMS WITH CISTERNS
  
- HOW DO WE COMPUTE CREDITS FOR:
  1. PERVIOUS CONCRETE
  
  2. PROMOTION OF NATURAL VEGETATION TO AVOID COMPACTION OF SOIL AND REDUCE INFILTRATION.
  
  3. FLORIDA FRIENDLY LANDSCAPING / GREEN INDUSTRY BMP

## 6. OTHER DISCUSSION ISSUES

- GEOTECHNICAL TESTING METHODS FOR SOIL PARAMETERS - THIS NEEDS TO BE UNIFIED ACROSS THE STATE & MADE SUPER CLEAR TO ENGINEERS WITH DIAGRAMS FOR DIFFERENT SITUATIONS AND TEST METHODS CLEARLY SPELLED OUT.
- REGIONAL STORMWATER PONDS & DEVELOPER PAYS INTO THIS BANK FOR CREDIT WHEN CANNOT MEET CRITERIA ON SITE?
- METHODOLOGY FOR PERVIOUS PAVEMENT CREDIT
- SILTATION OF DRY BOTTOM PONDS DURING CONSTRUCTION REMOVAL OF THE FINAL 1 FT AT THE END OF CONSTRUCTION. SILTATION DURING CONSTRUCTION IS A HUGE PROBLEM.

## 6. OTHER DISCUSSION ISSUES (CONTINUED)

- **COULD AN OVER-AGGRESSIVE WATER QUALITY RETENTION SYSTEM START REDUCING FRESHWATER DISCHARGES & MESSING UP NATURAL ISOHALINES?**
- **WATER QUALITY VOLUME FOR LAND-LOCKED SYSTEMS. RECOVERY CRITERIA FOR WATER QUANTITY SHOULD GOVERN - NEED TO INTRODUCE TRUE CONTINUOUS SIMULATION FOR THESE SYSTEMS FOR WATER QUANTITY?**
- **MONITORING REQUIREMENTS? WILL THERE BE ANY? CAN THEY GAGE PREDEVELOPMENT RUNOFF? HOW LONG IS A MONITORING PERIOD. IS THERE GOING TO BE A TRIGGER BASED ON SIZE? WHAT DO YOU DO IF THE SYSTEM IS NOT WORKING? NO ROOM TO RETROFIT.**
- **THE OBJECTIVE WOULD BE TO DEVELOP LAND IN A COST-EFFECTIVE MANNER TO ACHIEVE THE PRE-POST LOADING. ECONOMIC IMPACT ANALYSIS - REDUCTION IN NUMBER OF HOME BUILDING SITES PER TYPICAL SUBDIVISION?..INCREASE IN COST PER LOT?**