

WELLFIELD PROTECTION ORDINANCE AMENDMENT

TECHNICAL WORKSHOP
MAY 19, 2014

Presented by
Wilbur Mayorga, P.E.
Chief
Environmental Monitoring and Restoration Division

Modified May 22, 2014

PUBLIC ANNOUNCEMENT

Ordinance Amendment

Technical Workshop

**PROPOSED ORDINANCE AMENDING SECTION 24-5 OF THE
CODE OF MIAMI-DADE COUNTY, FLORIDA RELATING TO DEFINITIONS;
AMENDING SECTION 24-43 OF THE CODE OF MIAMI-DADE COUNTY,
FLORIDA RELATING TO PROTECTION OF POTABLE WATER SUPPLY WELLS
(PROPOSED WELLFIELD PROTECTION ORDINANCE)**

PROPOSED CHANGES INCLUDE

- Hazardous material definition
- Maps of the Northwest and West Wellfield Protection Areas
- Liquid waste storage, disposal of treatment within Wellfield Protection Areas
- Land uses within Wellfield Protection Areas (Table E-1, etc.)

DATE:

Monday **MAY 19th** 2014

TIME:

1:00pm to 3:00pm

LOCATION:



Overtown Transit Village
701 NW 1 Court
Training Room (2nd Floor)

Copies of the proposed ordinance and wellfield maps will be available on the Department's website prior to the workshop

For additional information please contact
Wilbur Mayorga at mayorw@miamidade.gov

AGENDA

1. Background
2. Overview of substantive changes
3. USGS Model
4. Proposed NWWF and WWF Boundaries
5. Wellfield Zones allowable uses
6. Review/Comments of proposed modifications ordinance

Background

- 02-05-2008
Execution of contract with USGS to redo groundwater/surface water model for Northwest and Southwest Wellfields
- 01-13-2011
1st technical workshop; USGS presents draft findings.
- 05-20-2011
2nd technical workshop

Background cont.,

- 04-19-2013

 - Report released posted on USGS website

- 04-2013

 - Announcement of 60 day comment period for the report.

 - No comments received.

- 05-01-2014

 - Announcement of technical workshop for ordinance amendment

Overview of Substantive Changes

1. Section 24-5 – *Definitions*

Revisions

- Hazardous Materials
- Sewage Loading

Additions

- De minimis quantity
- Onsite Sewage Treatment and Disposal System

Overview of Substantive Changes

2. Section 24-43(3) - *Maps of Cones of Influence...*
 - Incorporation of the USGS Open File Report 2013-1086
“Estimation of Capture Zones and Drawdown at the Northwest and West Well Fields, Miami-Dade County, Florida, Using an Unconstrained Monte Carlo Analysis: Recent (2004) and Proposed Conditions”
 - Revision of boundaries (new maps) of the Northwest and the West Wellfield Protection Area based on USGS report

Overview of Substantive Changes

3. Section 24-43(4) – *Septic Tanks, sanitary sewers, storm water disposal, liquid waste*

...

- Provides minimum distance between disposal system and potable water supply well
- Section 24-43(4)(a)
 - expanded to include other types of onsite sewage disposal systems. References to septic tanks deleted
 - change to allowable sewage loading for onsite sewage disposal systems
- Section 24-43(4)(b)
 - Provides specific testing criteria for exfiltration rates for sanitary sewers
 - Provides inspection and reporting frequency

Overview of Substantive Changes

4. Section 24-43(5) – *Prohibition of hazardous material within wellfield protection area*
 - Allowance for de minimis quantities of hazardous material outside the 30 day travel time, of wellfield protection areas (except for the Northwest WPA).
 - Allowance for prepackaged products utilized for the care and upkeep of the property, personal hygiene products, and office supplies
 - Allowance for fuel and lubricants contained inside a vehicle, for the operation of the vehicle.

Overview of Substantive Changes

Section 24-43(5) cont.,

- Allowance for small quantity generators (SQG) of hazardous waste outside the basic wellfield protection area of all WPAs. SQGs not allowed within the Northwest wellfield.

Overview of Substantive Changes

5. Section 24-43(10)- *Land uses within the Northwest Wellfield protection area and West Wellfield...*
 - Applicability of this section to the West wellfield deleted.
 - Table E-1 deleted
 - Land use zoning classifications deleted
 - Expands criteria to be considered when determining appropriate land uses within the Northwest Wellfield by providing land use categories

Proposed Revised NWWF and WWF Boundaries

Basis

USGS report

- Model
- Assumptions
- Inputs
- Lakes
- Seepage
- Smoothing
- Selection of drawdown

USGS Model

Model Features:

- 2D groundwater flow model w/ particle tracking
- Constructed using MODFLOW-2005 and MODPATH
- Model area: urbanized MD county, east of L-31N canal
- Calibration period: 1996-2004
- Lakes represented explicitly with high kh and porosity
- Calibrated to daily groundwater level and net canal-basin exchange data

Model Features cont.,

- Well-field capture zones determined using stochastic approach – 10,000 forward simulations
- Capture zones estimated using 95% confidence intervals for selected dry, average and wet conditions
- Travel times through lakes adjusted based on residence times calculated using lake volumes and known outflows
- Scenarios representing flow barrier west of L-31N canal and WWF, seepage canal west of NWWF along Dade-Broward Levee, and expansion of quarried areas by about 25 mi² and resulting increase in lake volumes

USGS Model

Major assumptions:

- 1-D model – sufficient data do not exist to map flow units within Biscayne aquifer throughout model domain, nor to calibrate water-level observations
- Laminar flow – nature of porosity in Biscayne aquifer indicates possibility of turbulent flow near WWF and NWWF
- Particle tracking can only track to western edge of model, source areas may extend west into Everglades
- Precipitation and ET distributed evenly over modeled area
- Mixing in lakes not simulated explicitly

USGS Model

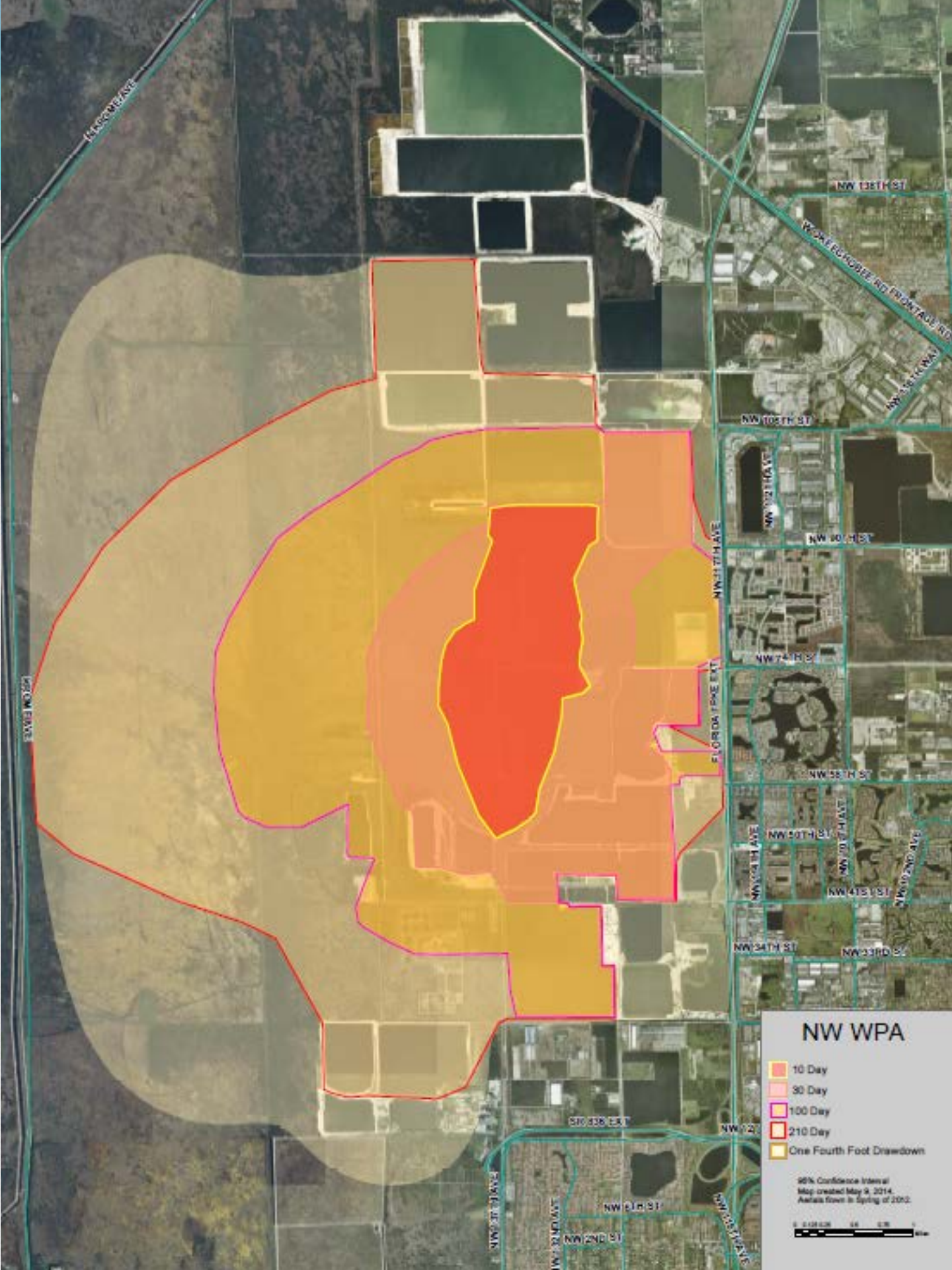
Limitations of model:

- Uncertainty in lateral distribution of hydraulic properties – thus the stochastic approach
- Uncertainty in vertical layering and distribution of hydraulic properties – thus one-layer approach
- Runoff and canal discharge not represented explicitly
- Distribution of groundwater recharge unknown
- Particle travel times through lakes based on assumption of residence times
- Particle tracking with MODPATH represents only advective flow



Proposed Revised NWWF and WWF Boundaries

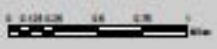
Proposed NWWF and WWF maps

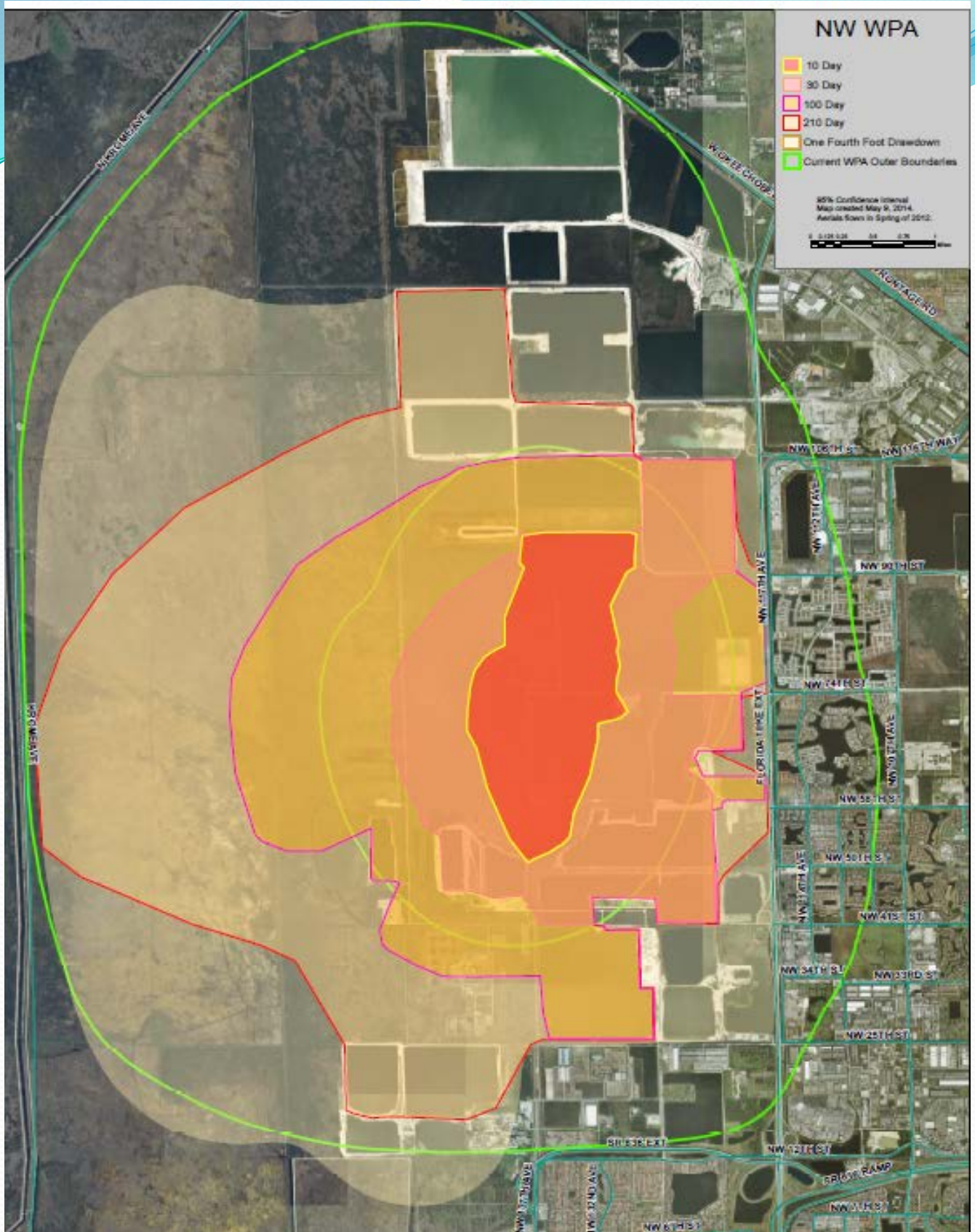


NW WPA

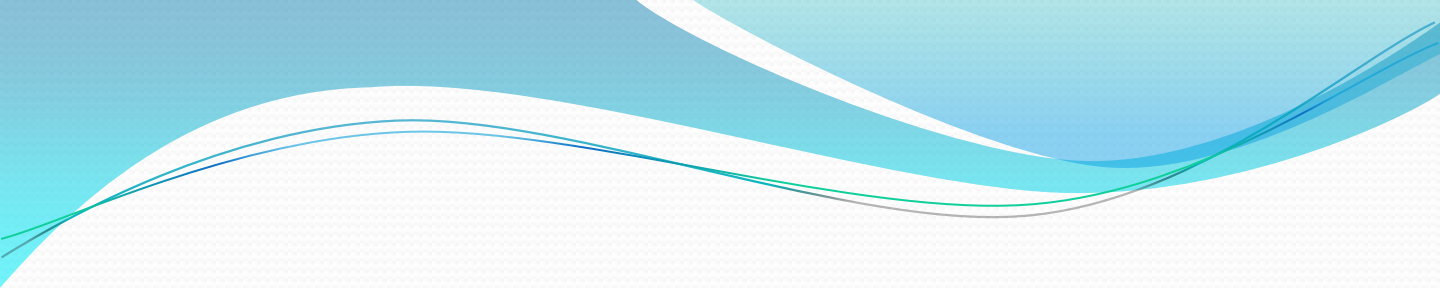
- 10 Day
- 30 Day
- 100 Day
- 210 Day
- One Fourth Foot Drawdown

90% Confidence Interval
Map created May 9, 2014.
Aerial from Spring of 2002.





Map showing overlay of proposed Northwest Wellfield versus the outer boundary of the current Northwest Wellfield



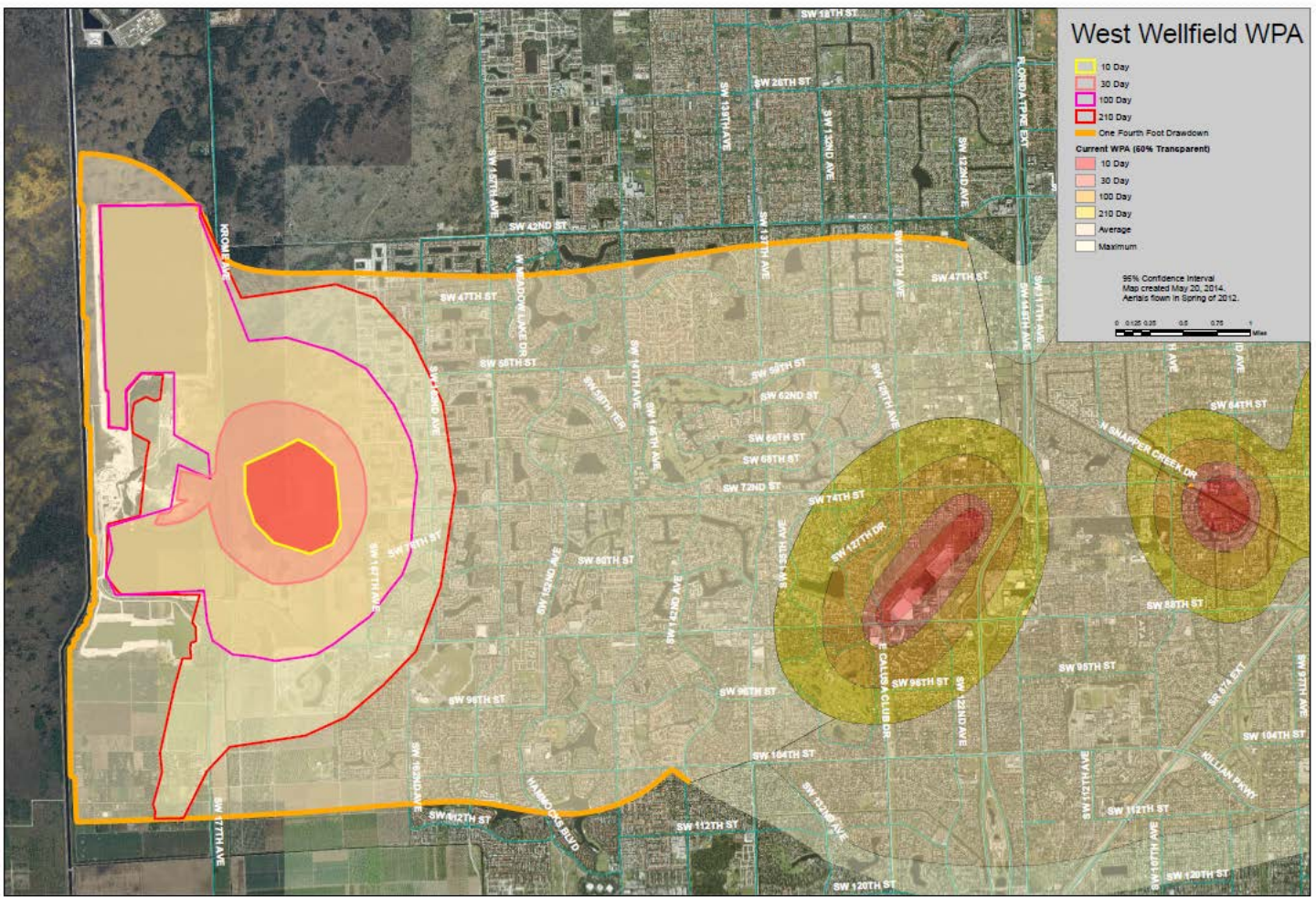
West Wellfield WPA

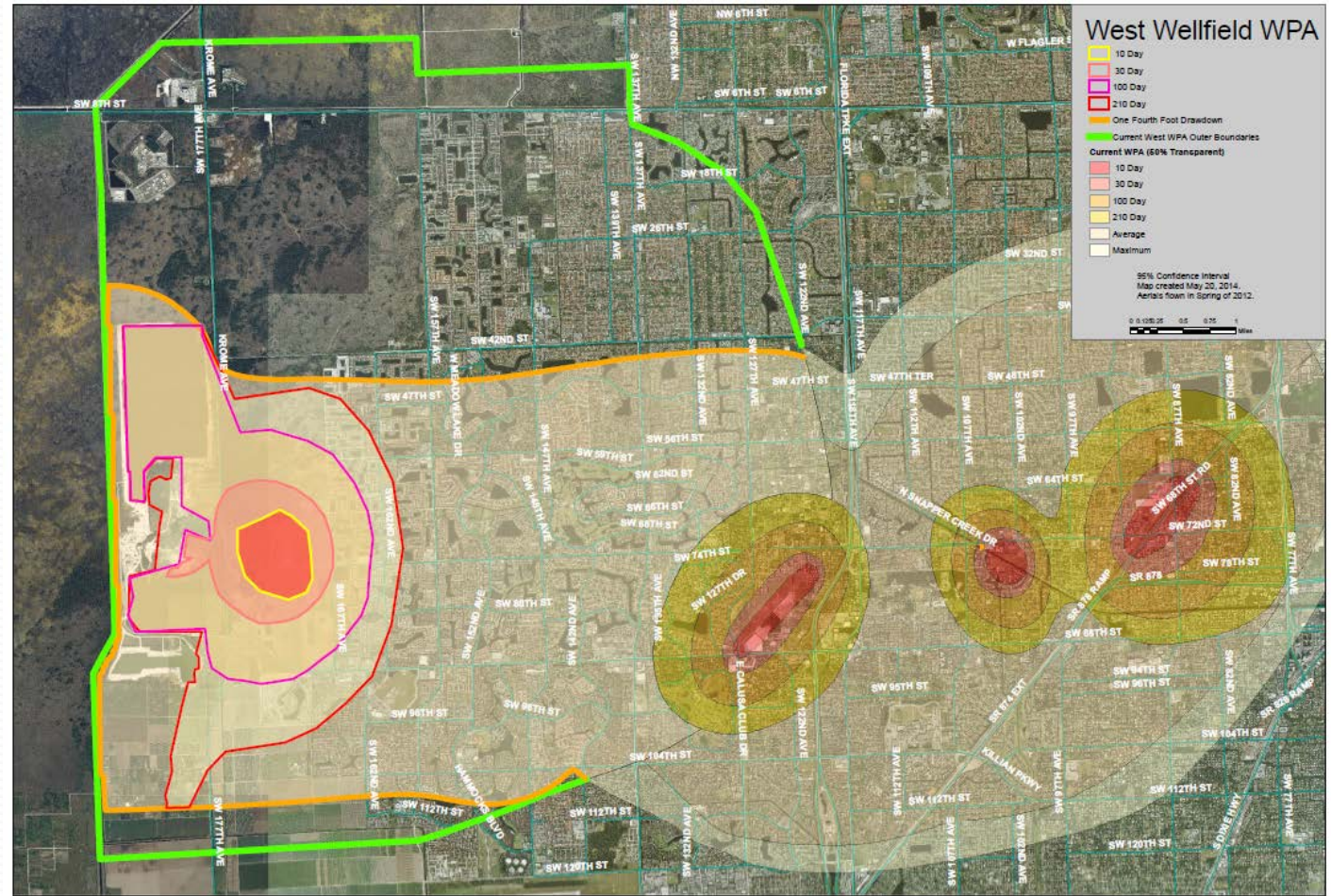
10 Day
30 Day
100 Day
210 Day
One Fourth Foot Drawdown

Current WPA (60% Transparent)
10 Day
30 Day
100 Day
210 Day
Average
Maximum

95% Confidence Interval
Map created May 20, 2014.
Aerials from Spring of 2012.

0 0.125 0.25 0.5 0.75 1 Miles

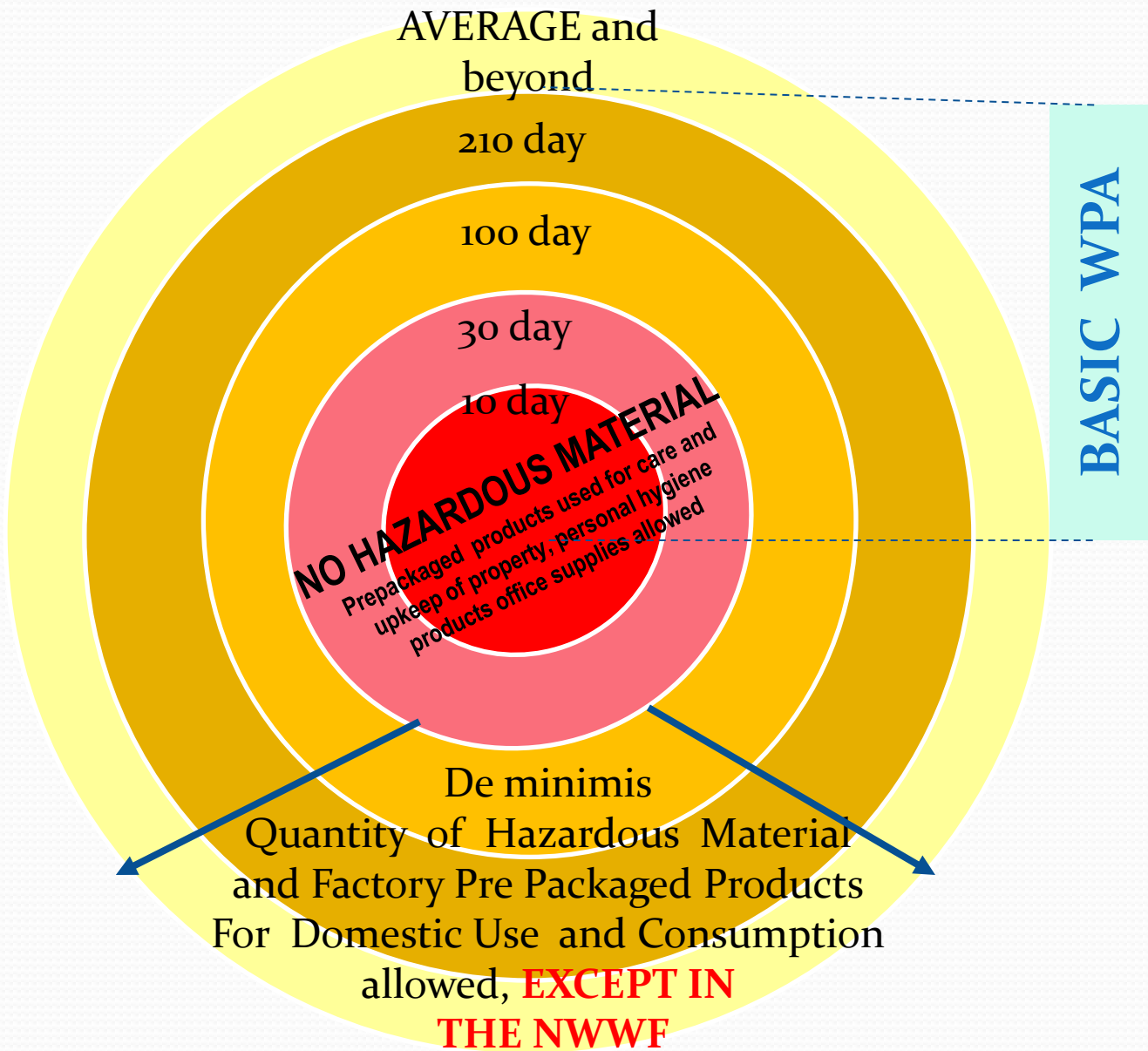




Map showing overlay of proposed West Wellfield versus the outer boundary of the current West Wellfield Interim Protection Area

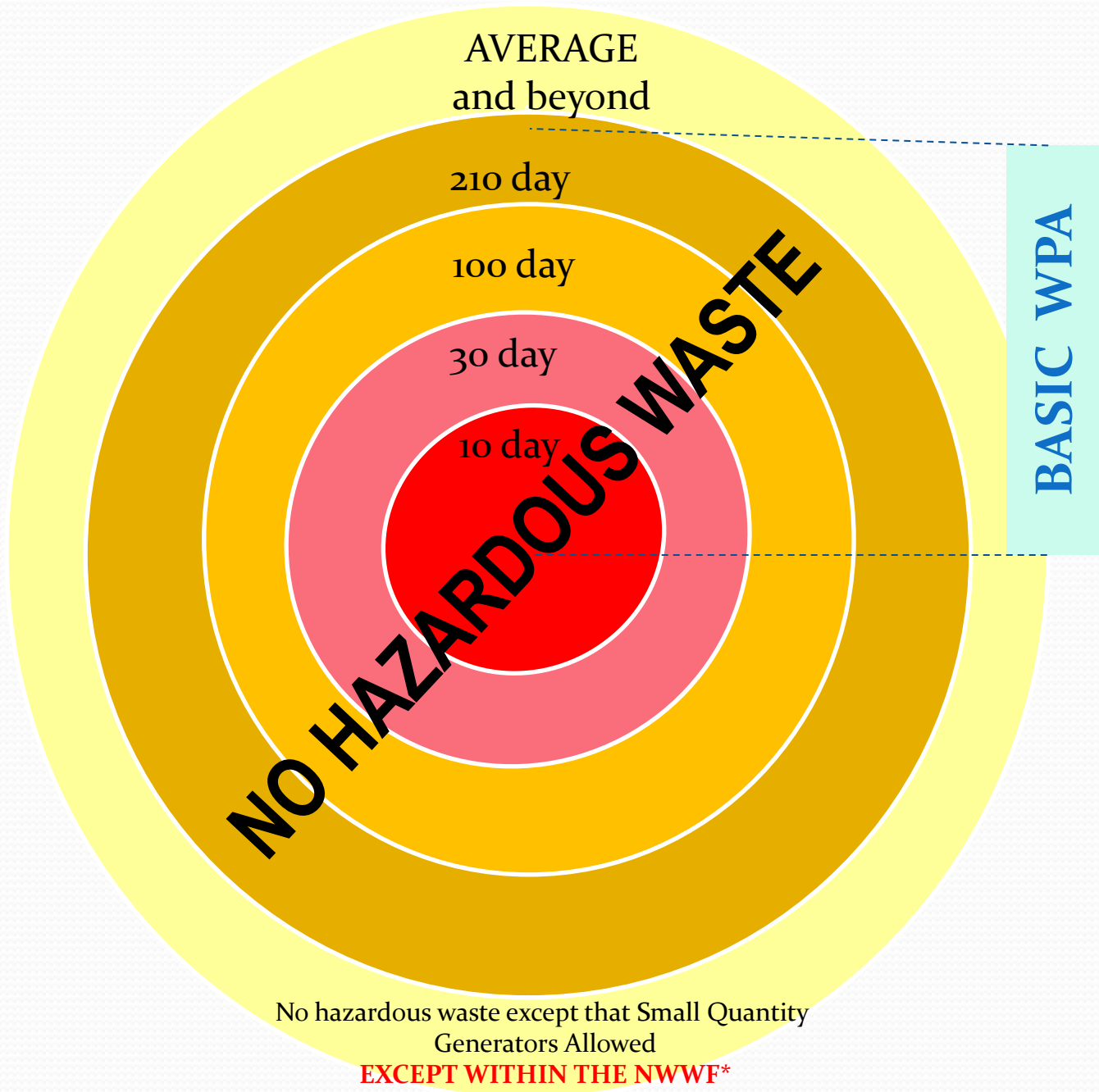
Details

2. Is it allowable?



Details

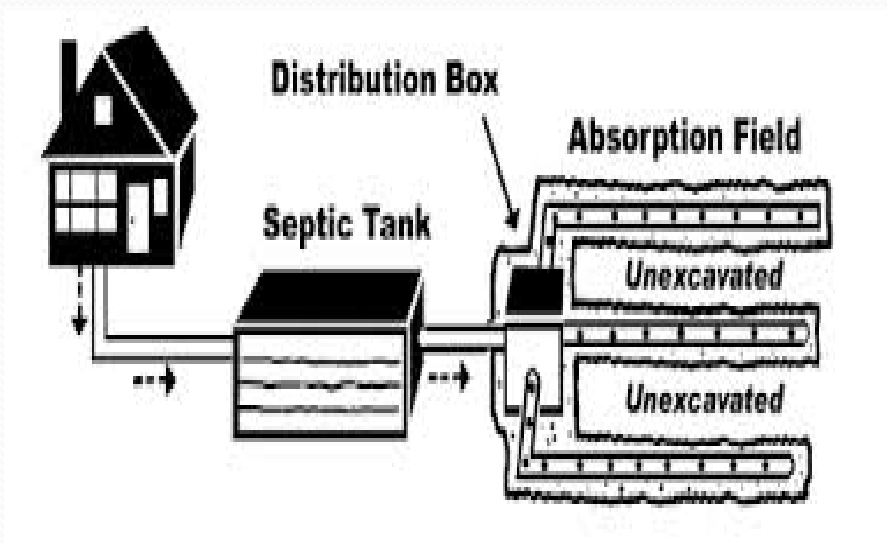
2. Is it allowed??



*Or within that portion of the West Wellfield which is outside the basic and outside the UDB

Section 24-43(4) – *Septic Tanks, sanitary sewers, storm water disposal, liquid waste ...*

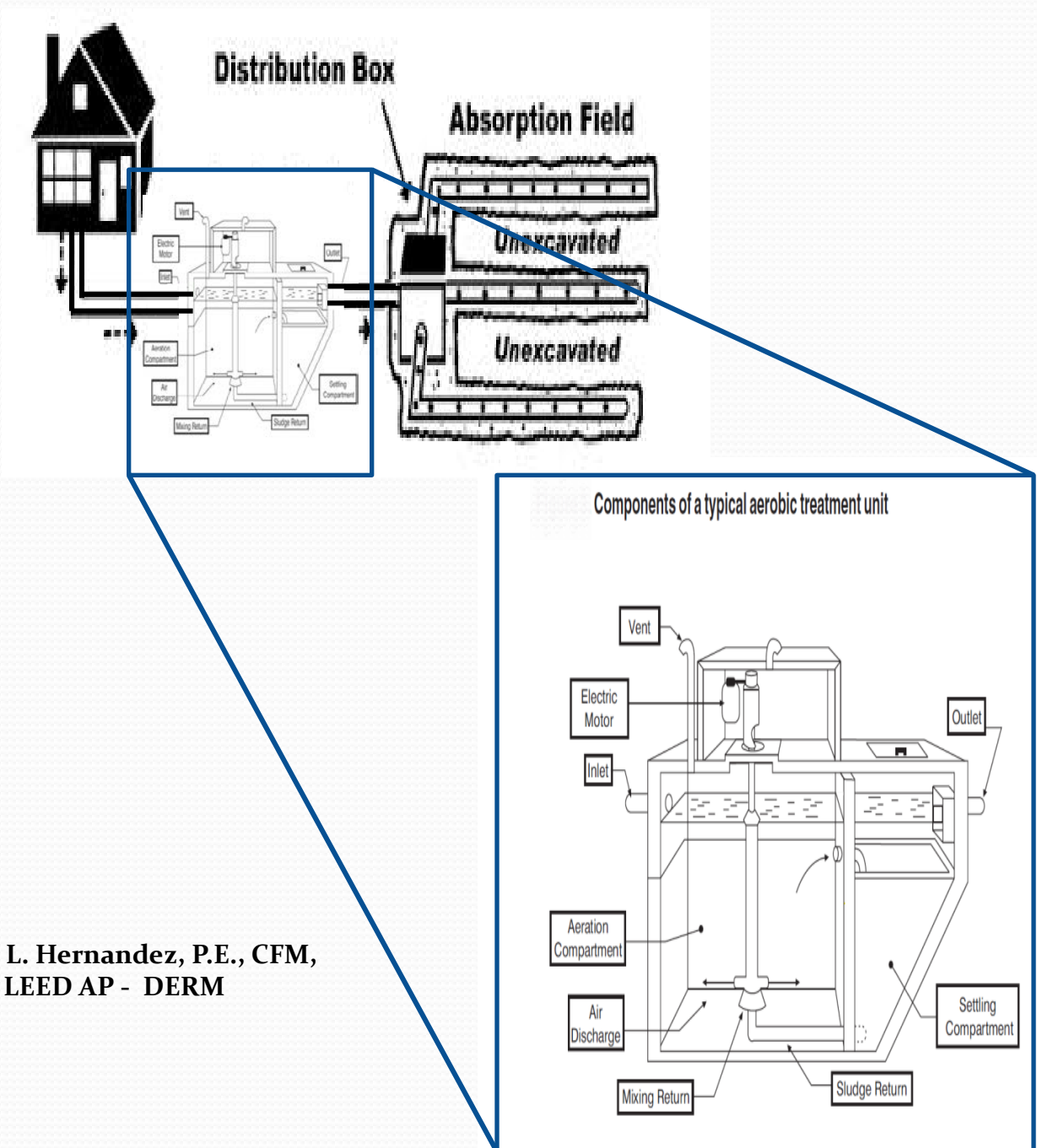
24-43 (4)(a): OSTDS vs. Septic Tanks



Carlos L. Hernandez, P.E., CFM, CEHP, LEED AP - DERM

Section 24-43(4) – *Septic Tanks, sanitary sewers, storm water disposal, liquid waste ...*

24-43 (4)(a): OSTDS vs. Septic Tanks



**Carlos L. Hernandez, P.E., CFM,
CEHP, LEED AP - DERM**

Section 24-43(4) – *Septic Tanks, sanitary sewers, storm water disposal, liquid waste ...*

24-43 (4)(a): Sewage Loading for Residential

- Northwest Wellfield & West Wellfield, outside UDB

$$\text{Area} = \frac{\text{Residential Sewage Flow Rate}}{\text{Allowable Sewage Loading}}$$

where,

$$\text{Residential Sewage Flow Rate} = 350 \text{ gpd}^{**}$$

$$\text{Allowable Sewage Loading} = 70 \text{ gpd/Ac}$$

therefore,,

$$\text{Area} = \frac{350 \text{ gpd}}{70 \text{ gpd/Ac}} = 5 \text{ Acres}$$

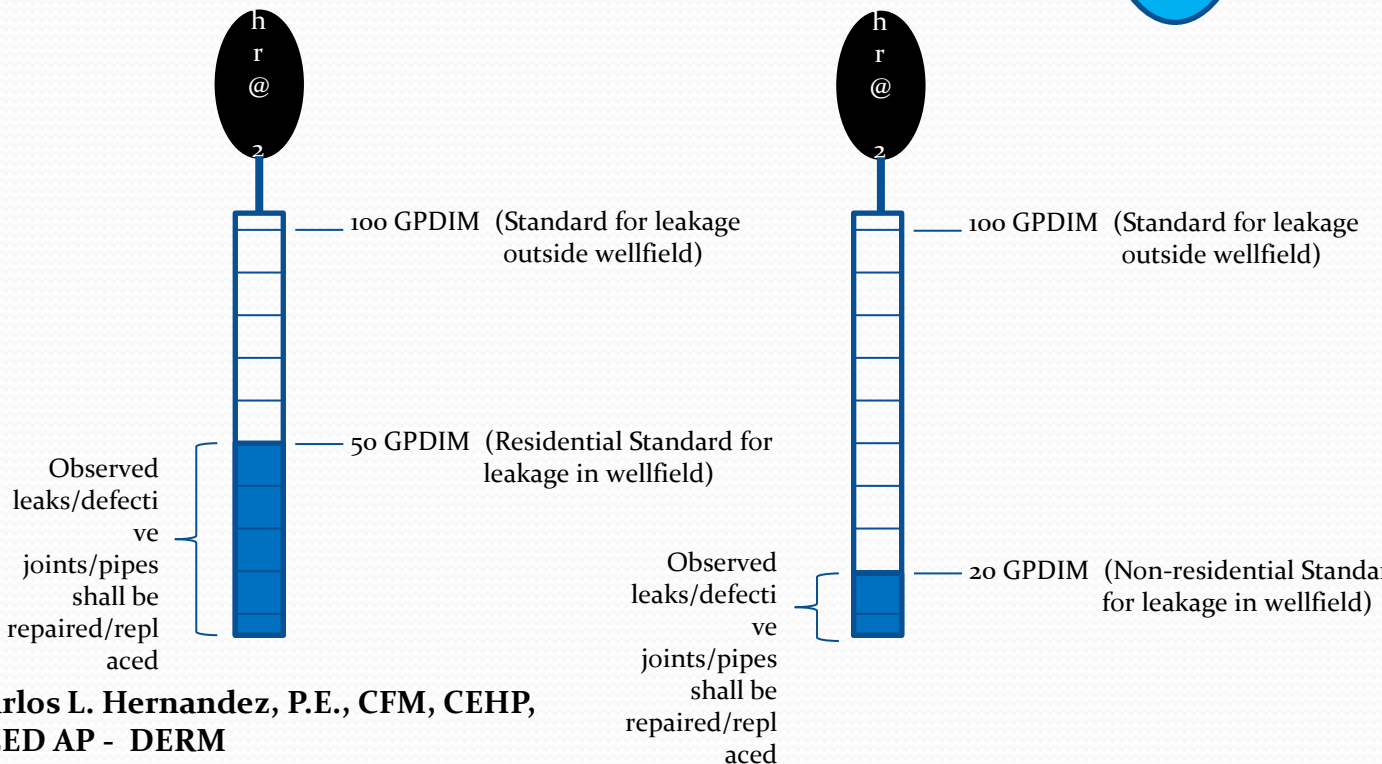
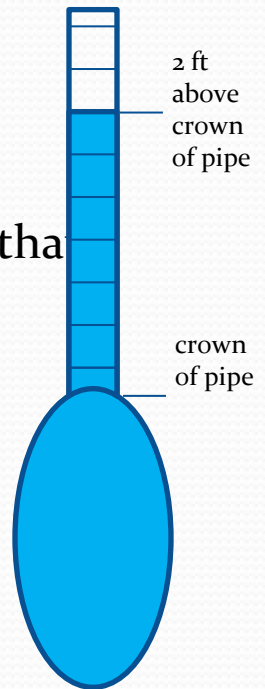
****** Rate at the time code established 70 gpd/Ac

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Section 24-43(4) – *Septic Tanks, sanitary sewers, storm water disposal, liquid waste ...*

24-43 (4)(b): Sanitary Sewer Systems

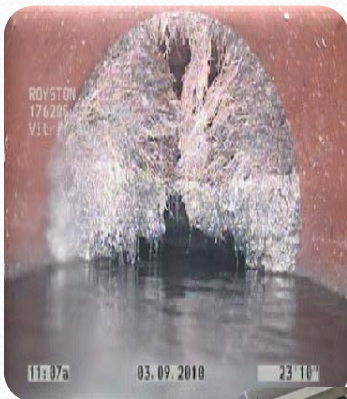
- Maintained “Sewage Loading” for all New Construction, Enlargements and Alterations that increase Gross Area.
- Includes the following protection:
 - Leakage Testing for All new systems



Section 24-43(4) – *Septic Tanks, sanitary sewers, storm water disposal, liquid waste ...*

24-43 (4)(b): Sanitary Sewer Systems

- Gravity sanitary sewers 8” or larger are televised (Closed Circuit TV) and manholes are visually inspected every 5 years. All defects shall be repaired.

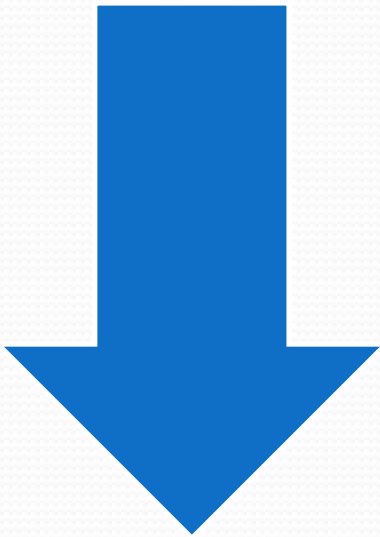




DRAFT ORDINANCE

- Review/Comments of changes

Comment Period



Comment
Period for the
proposed
Ordinance
open until
June 6, 2014



Comments shall be
provided to Wilbur
Mayorga at
mayorw@miamidade.gov



Resources

- Proposed Ordinance

<http://www.miamidade.gov/environment/library/guidelines/2014-05-19-proposed-wellfield-protection-ordinance.pdf>

- Proposed Wellfield Maps

Northwest Wellfield and West Wellfield Protection Areas

- May 17, 2014 Public Workshop Presentation (modified version)

- USGS REPORT

<http://pubs.usgs.gov/of/2013/1086/>