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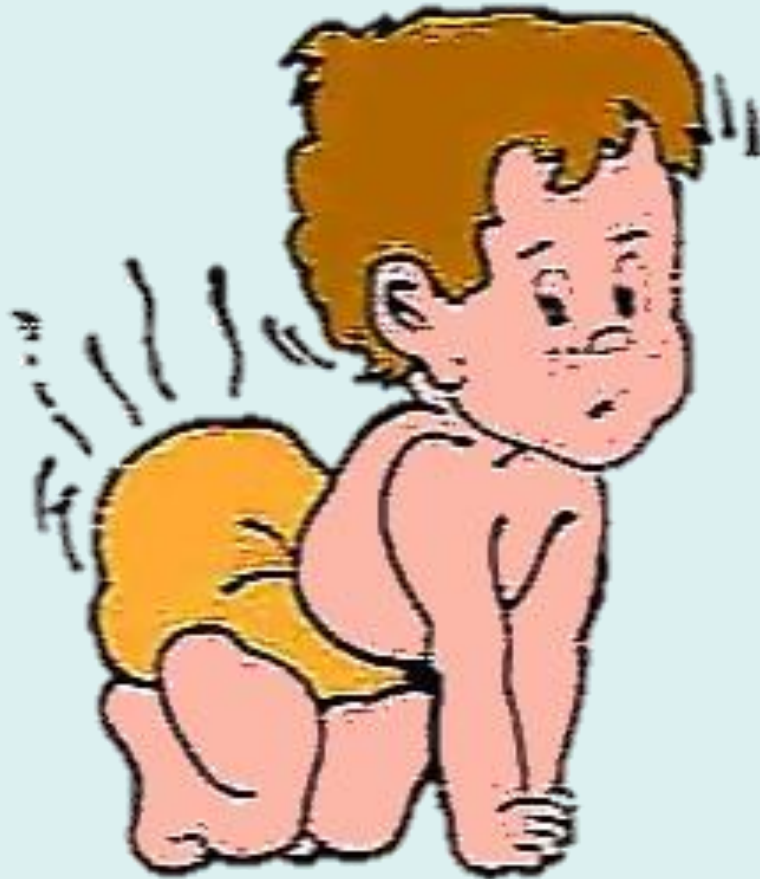
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# Color Theory Basics for Presentation Design

Posted by Scott Schwertly | June 11, 2014

# Where can I dump my future loads ?





Why would I take your Crap ?



# Presentation Outline

- Common Ground
- Current Practices - Future Trends
- Treatment Capacities
- Land Application Requirements
- Landfill Requirements
- What We Think We Know





Big Pipe

Onsite

Water Quality Issues

# Onsite vs. Big pipe

Onsite

Big Pipe

BOD

BOD

TSS

TSS

TN

TN

TP

TP

E-coli

E-coli

# Onsite vs. Big pipe

Onsite

Big Pipe

ATU

Activated Sludge

Recirculating Filter

Trickling Filters

Drain Field

Trickling Filters

Septage

Solids Handling

Microbiology

Microbiology

Disposal

Disposal











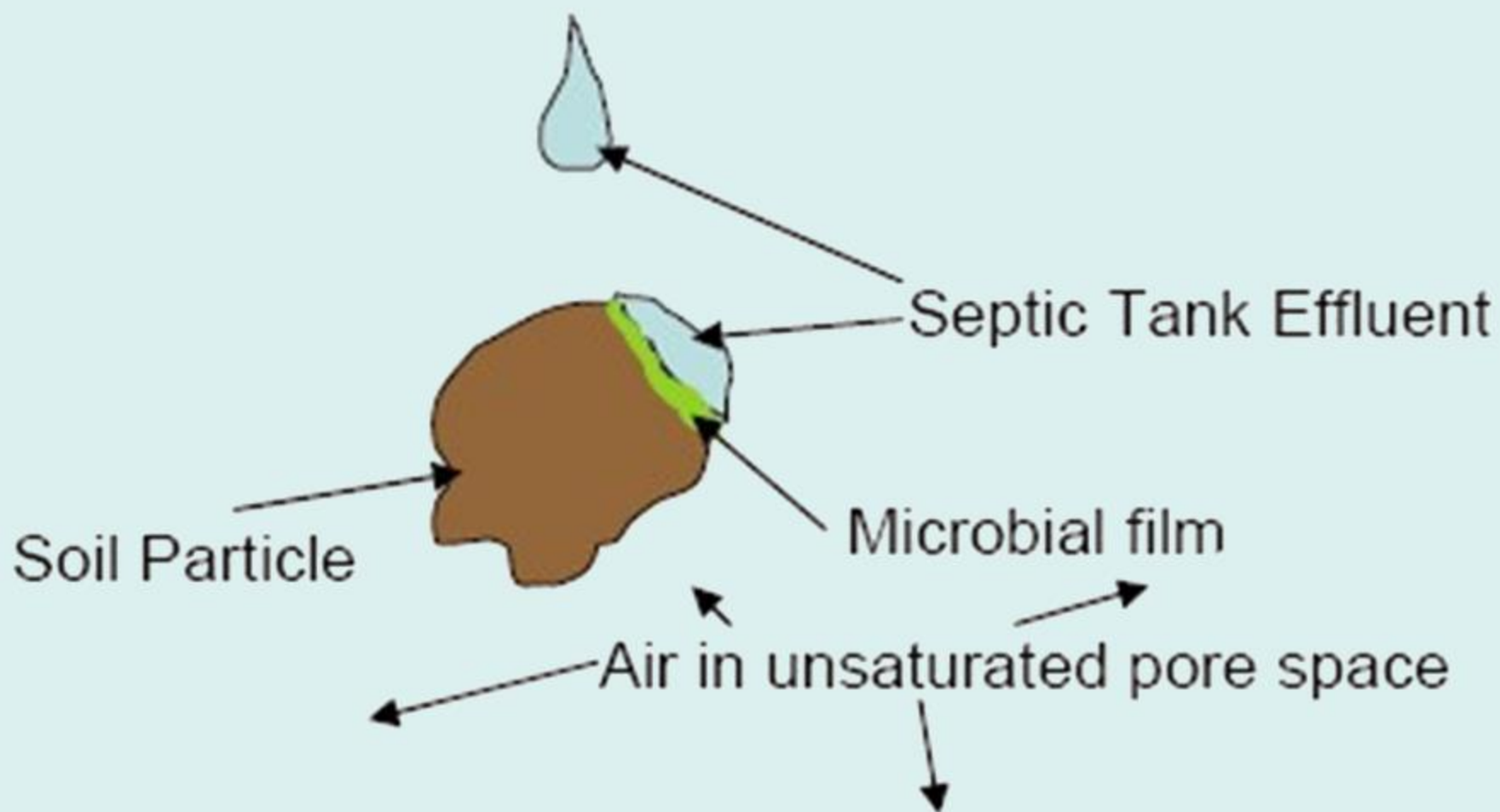


























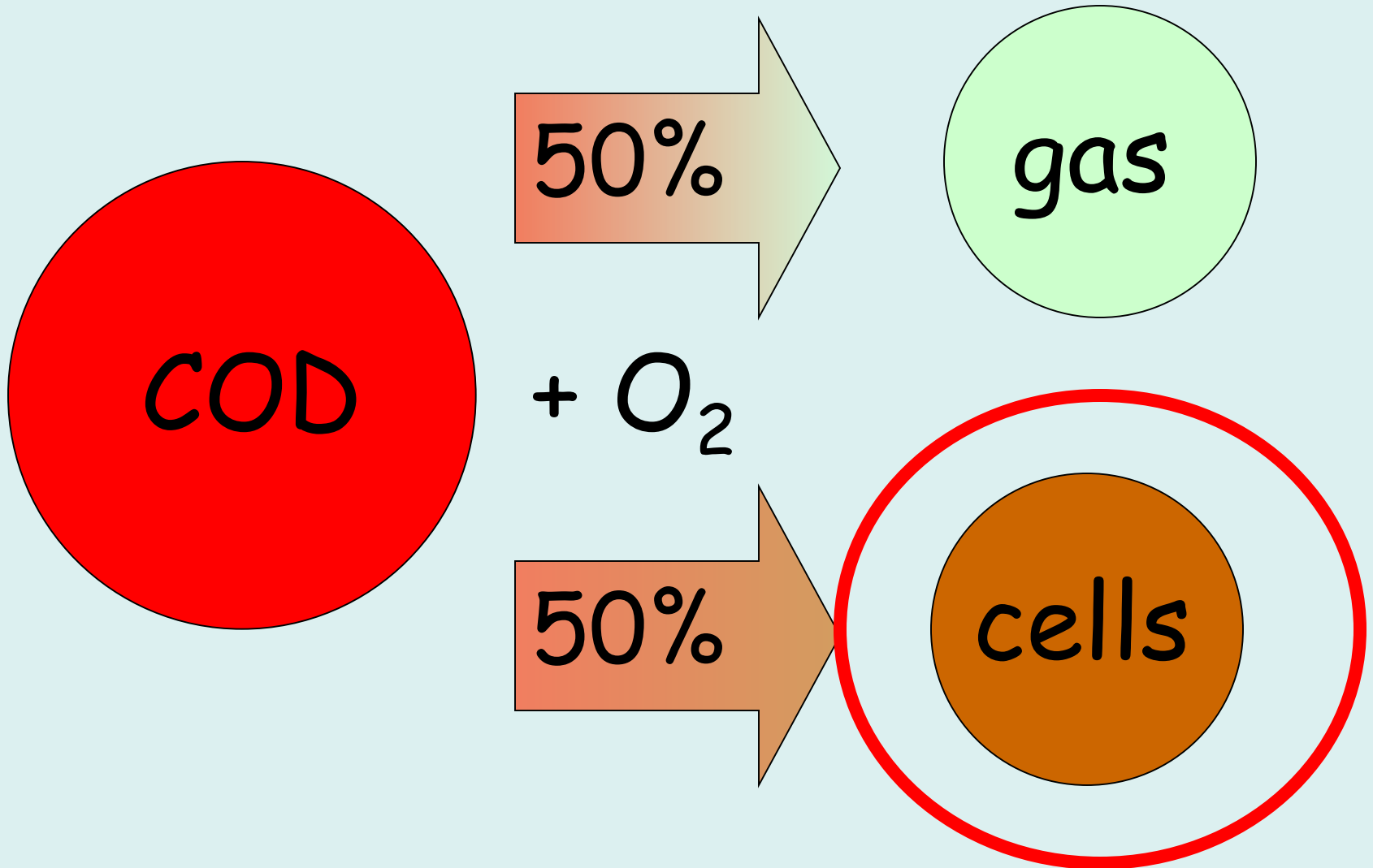






# Digestion Processes

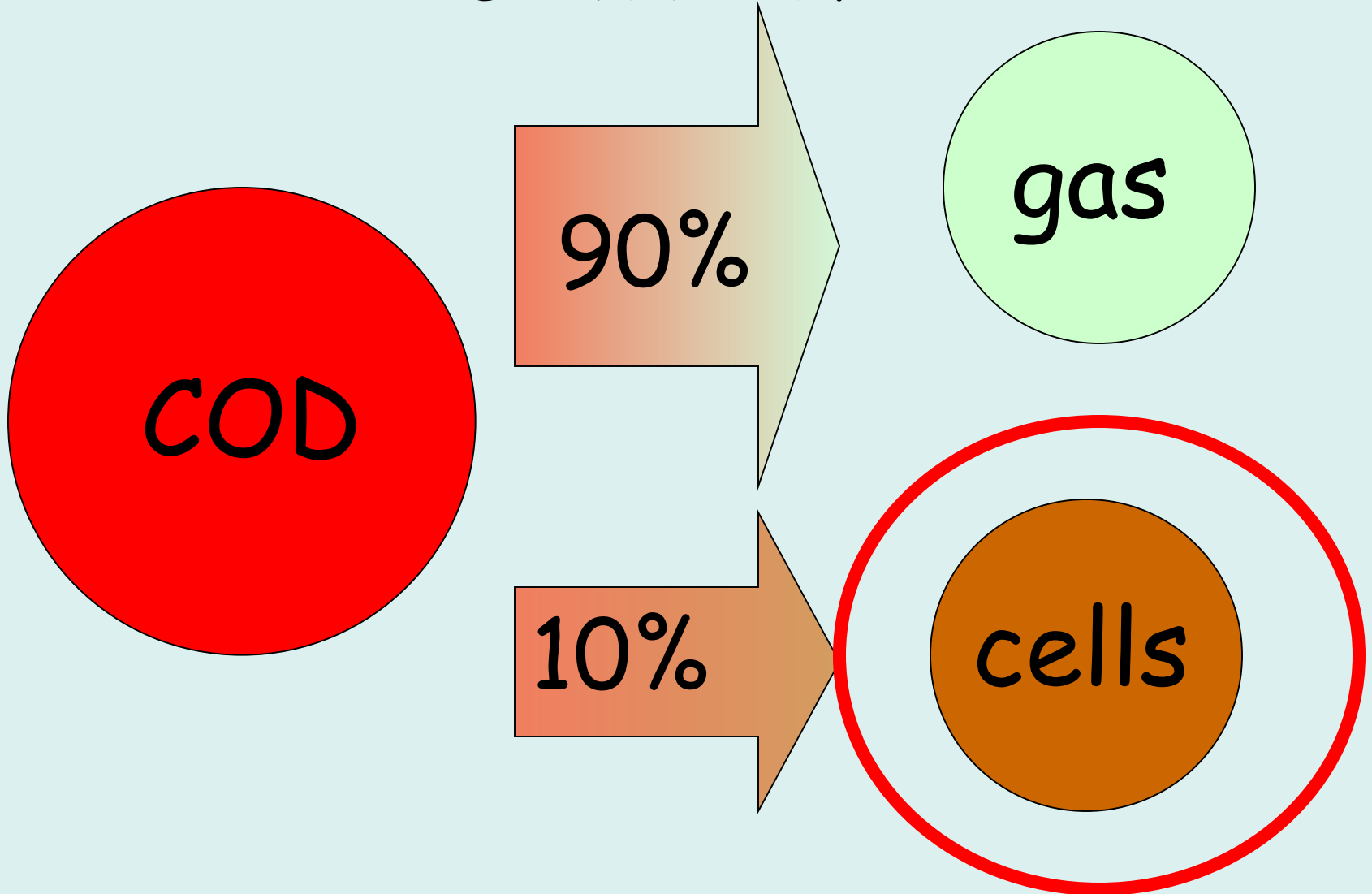
## COD Aerobic Fate





# Digestion Processes

## COD Anaerobic Fate





# Septage Disposal Options

- Treatment Plants
- Land Application
- Landfills

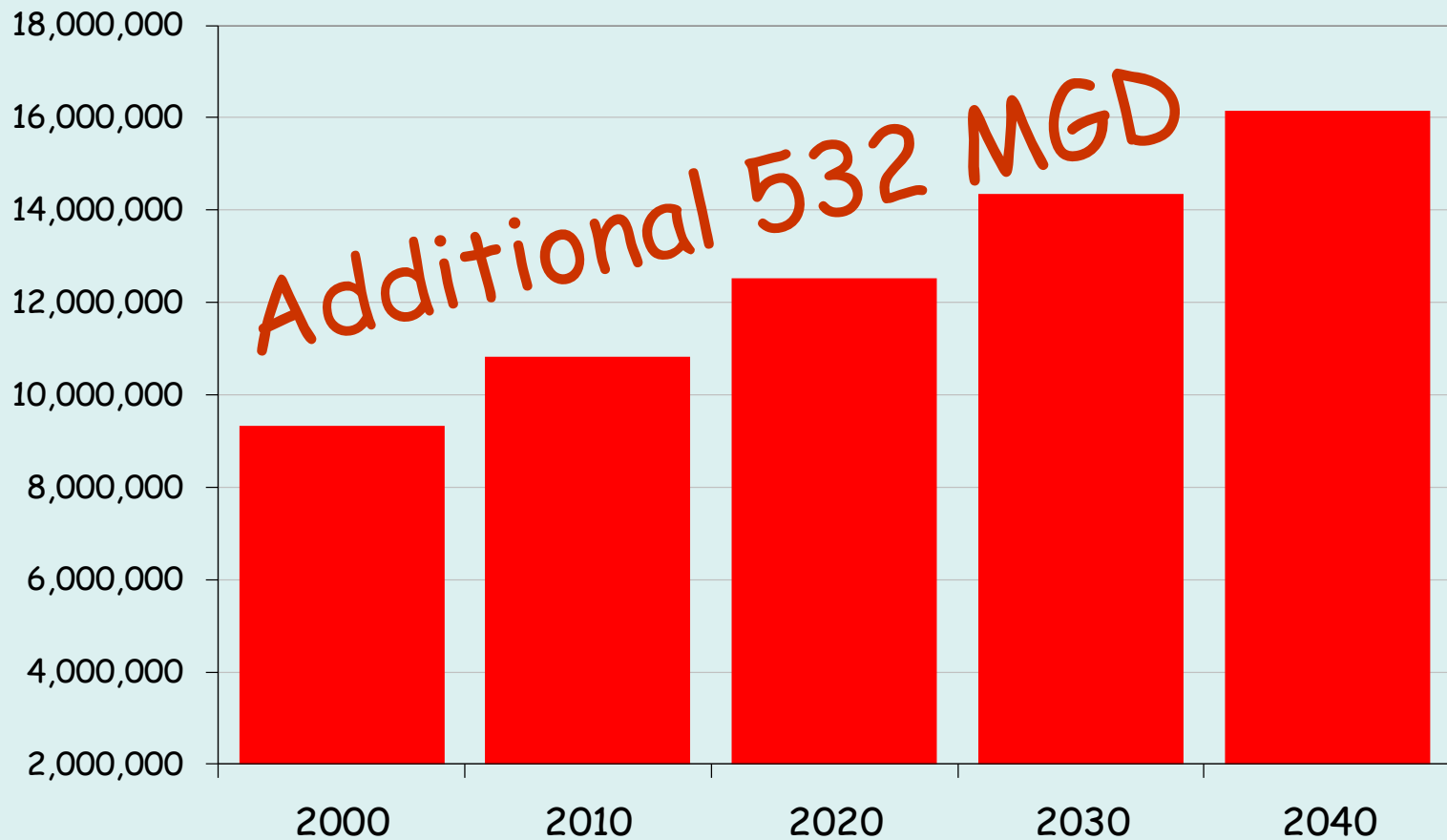


# Treatment Plants

- All Treatment Plants are Not Equal
- Mechanical - Capacity = Capacity
- Lagoons - Capacity  $\neq$  Capacity

# Region 8 Population Projection

## Total Population



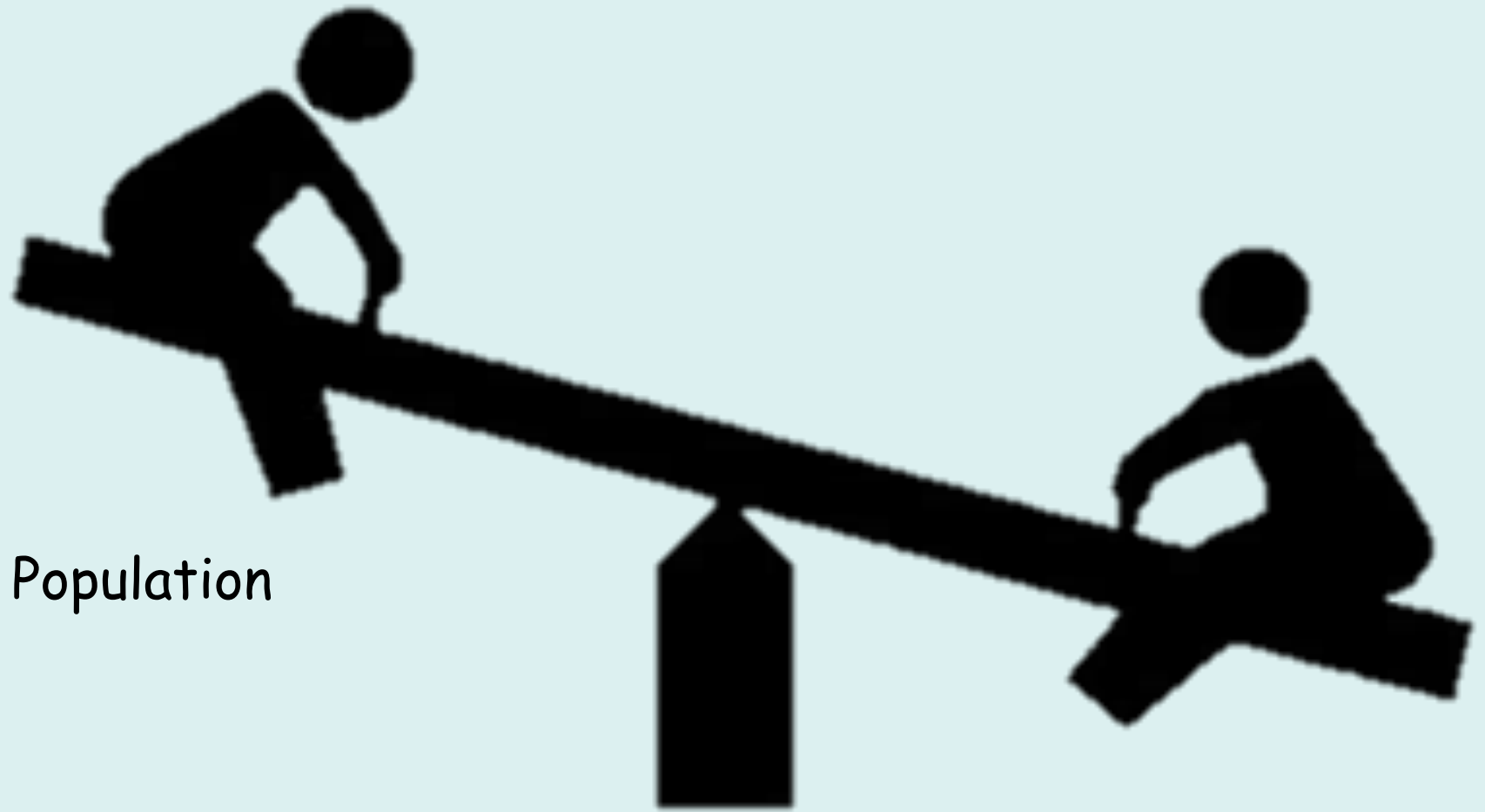




# 2012 CWNS Results

- National Needs \$357.7 Billions
- Region 8's Needs \$6.38 Billions
- 2010 Population 10.83 Million
- \$588 per Capita





Population

Treatment Plants  
Taking Septage



# EPA Septage Manual

# EPA's Preferred Disposal Tree

- Lagoons
  - Aerated
- Mechanical
  - Activated Sludge
  - Trickling Filters
- Lagoons
  - Total Containment





















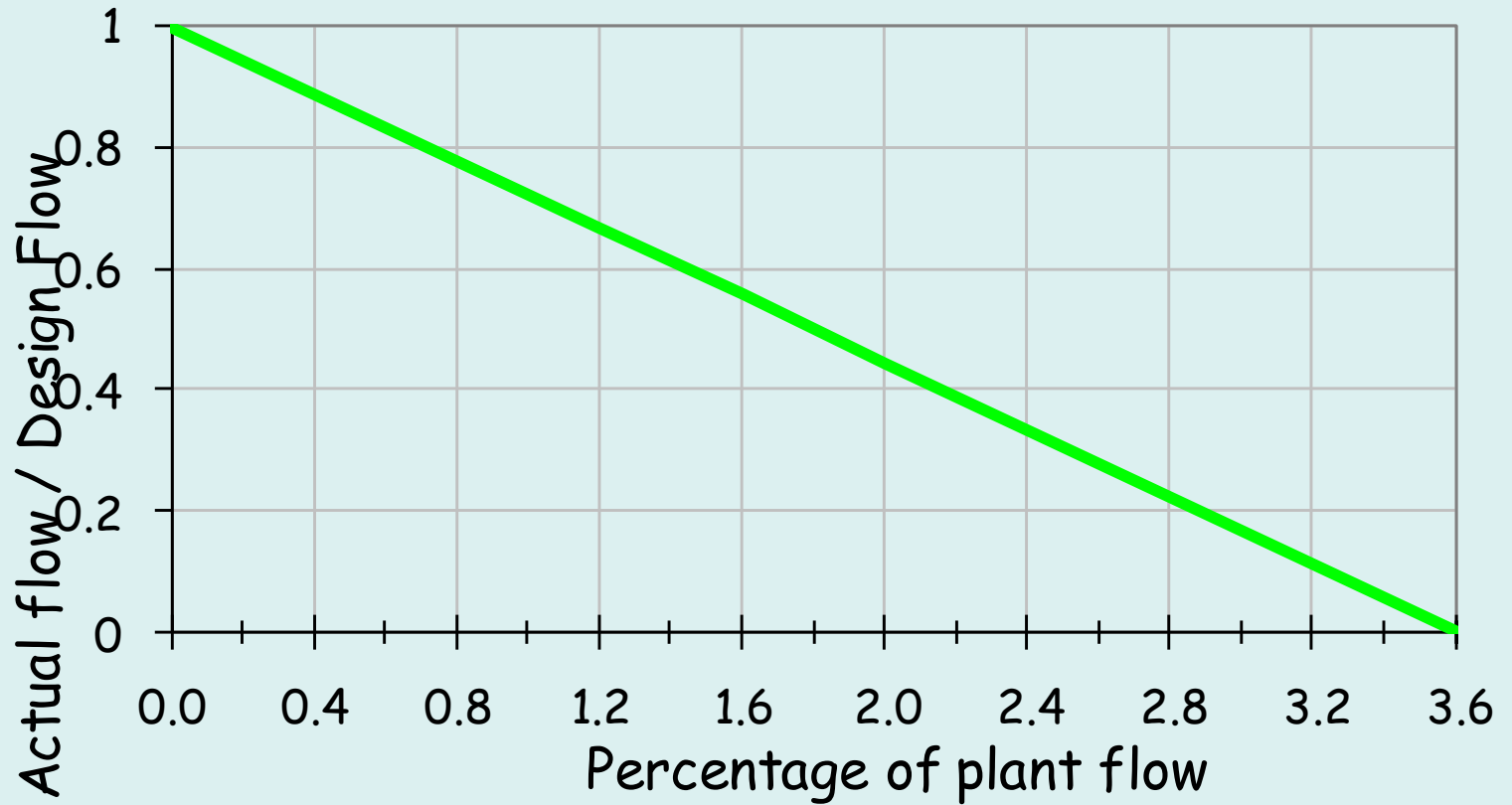
# Septage Loading Rate

- Function of available capacity
- Design flow ?
- Actual flow ?
- Calculate acceptable flow
- **NOT FOR FACULATATIVE LAGOONS**

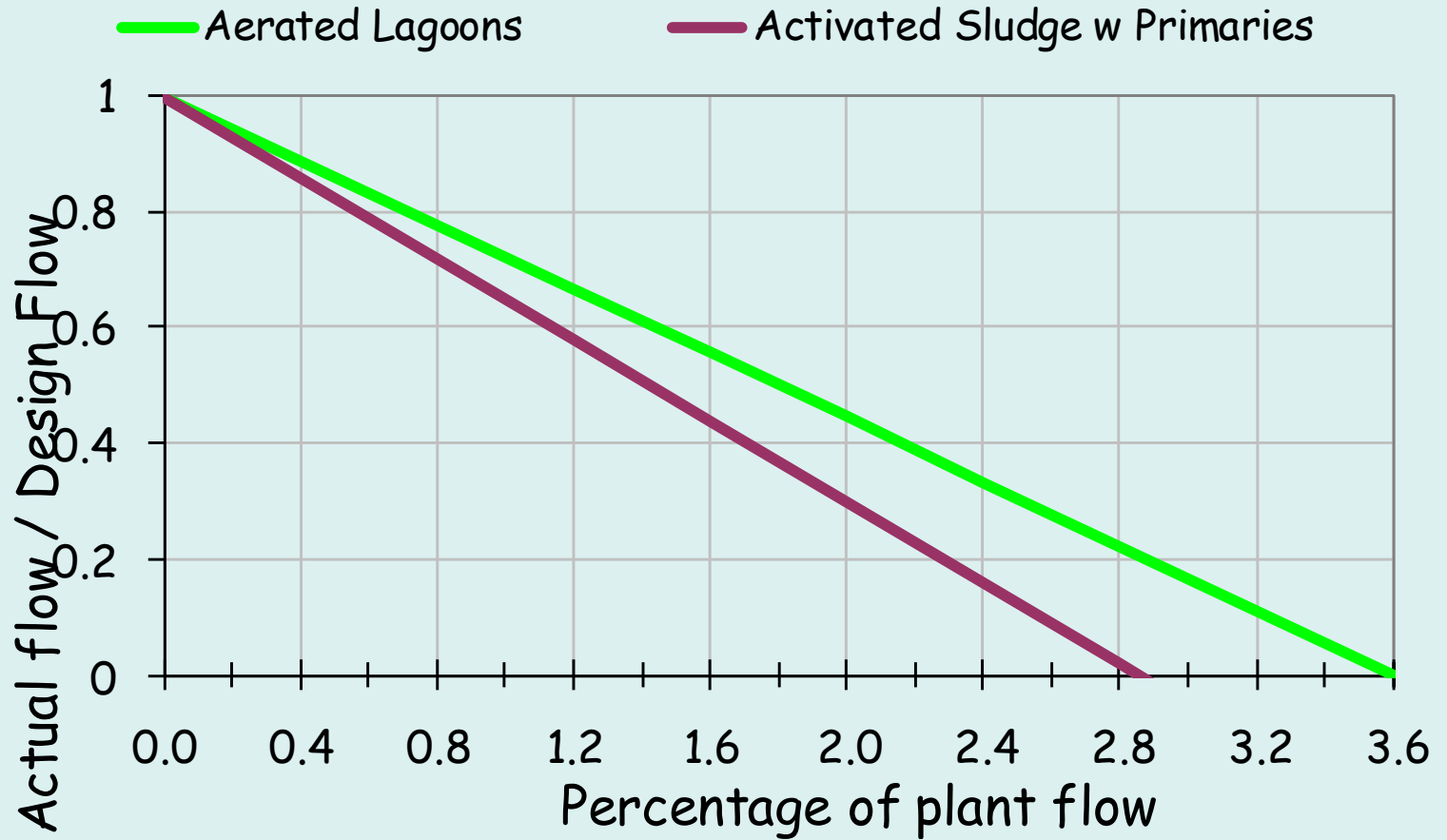


# Allowable Septage (EPA 1994)

— Aerated Lagoons



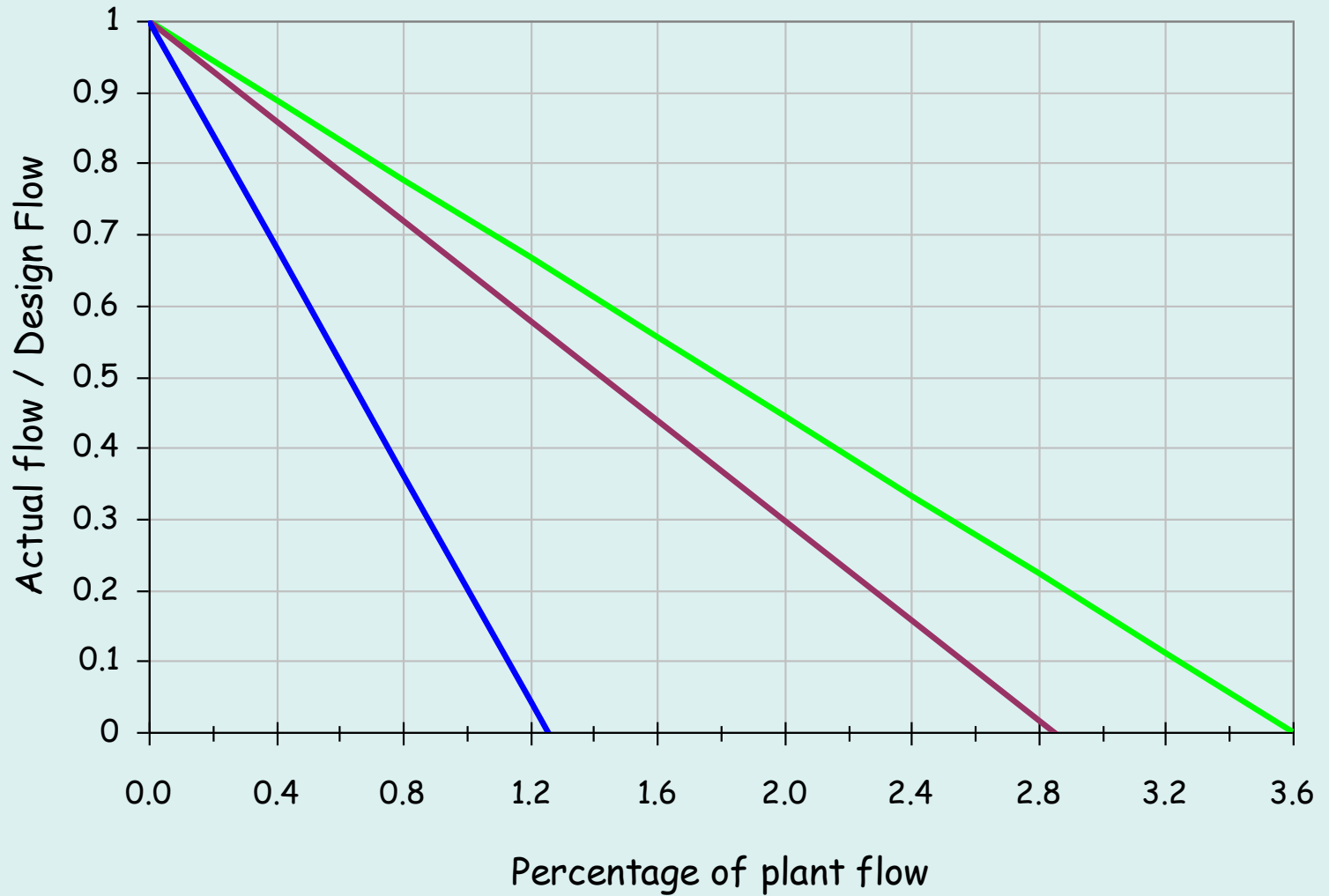
# Allowable Septage (EPA 1994)





# Allowable Septage (EPA 1994)

— Aerated Lagoons — Activated Sludge w Primaries — Activated Sludge w/o Primaries



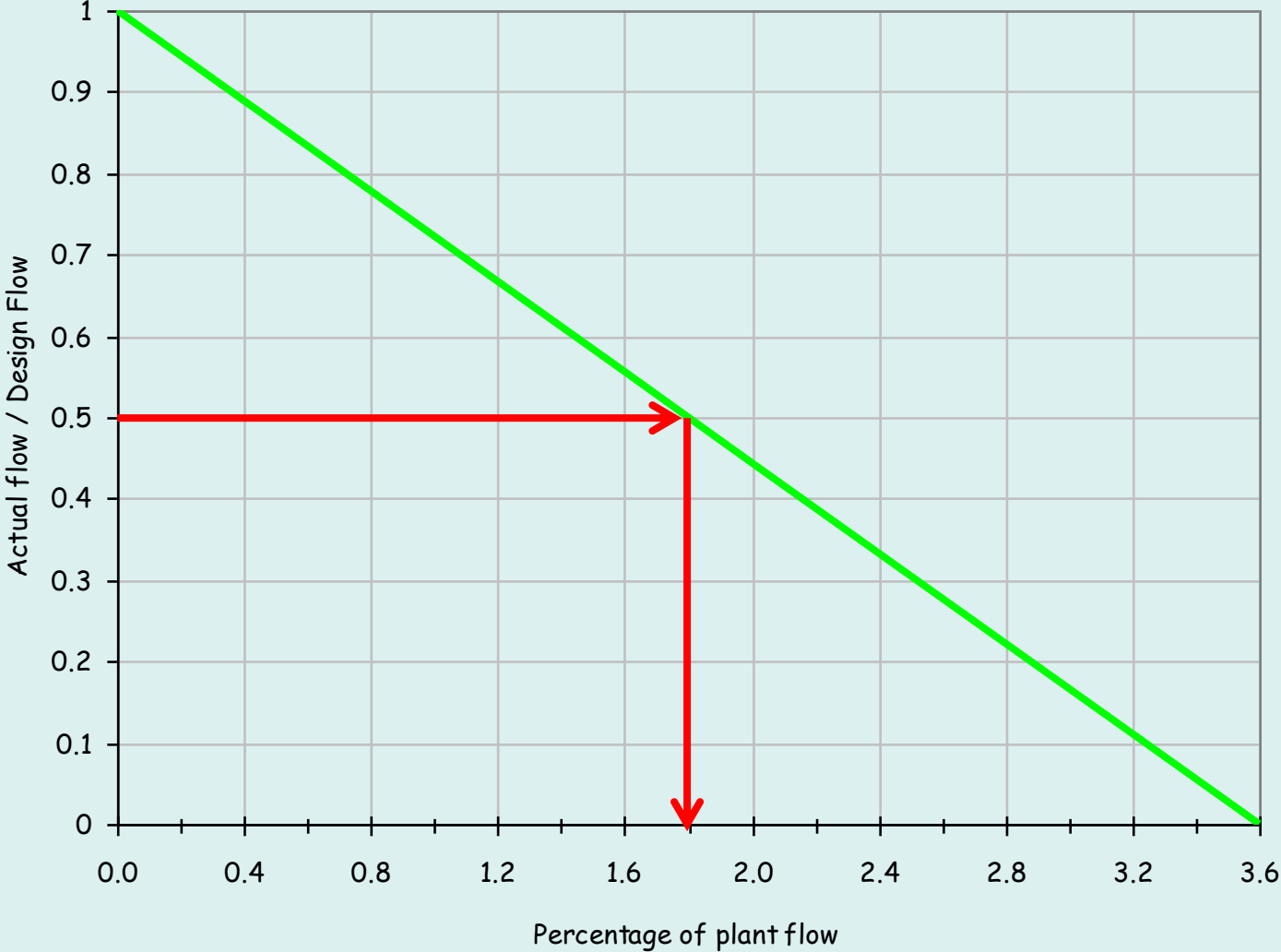
# Septage Loading Rate

- Example
- Design flow = 150,000 gpd
- Actual flow  $\cong$  75,000 gpd
- Ratio = 0.5



# Allowable Septage (EPA 1994)

Aerated Lagoons

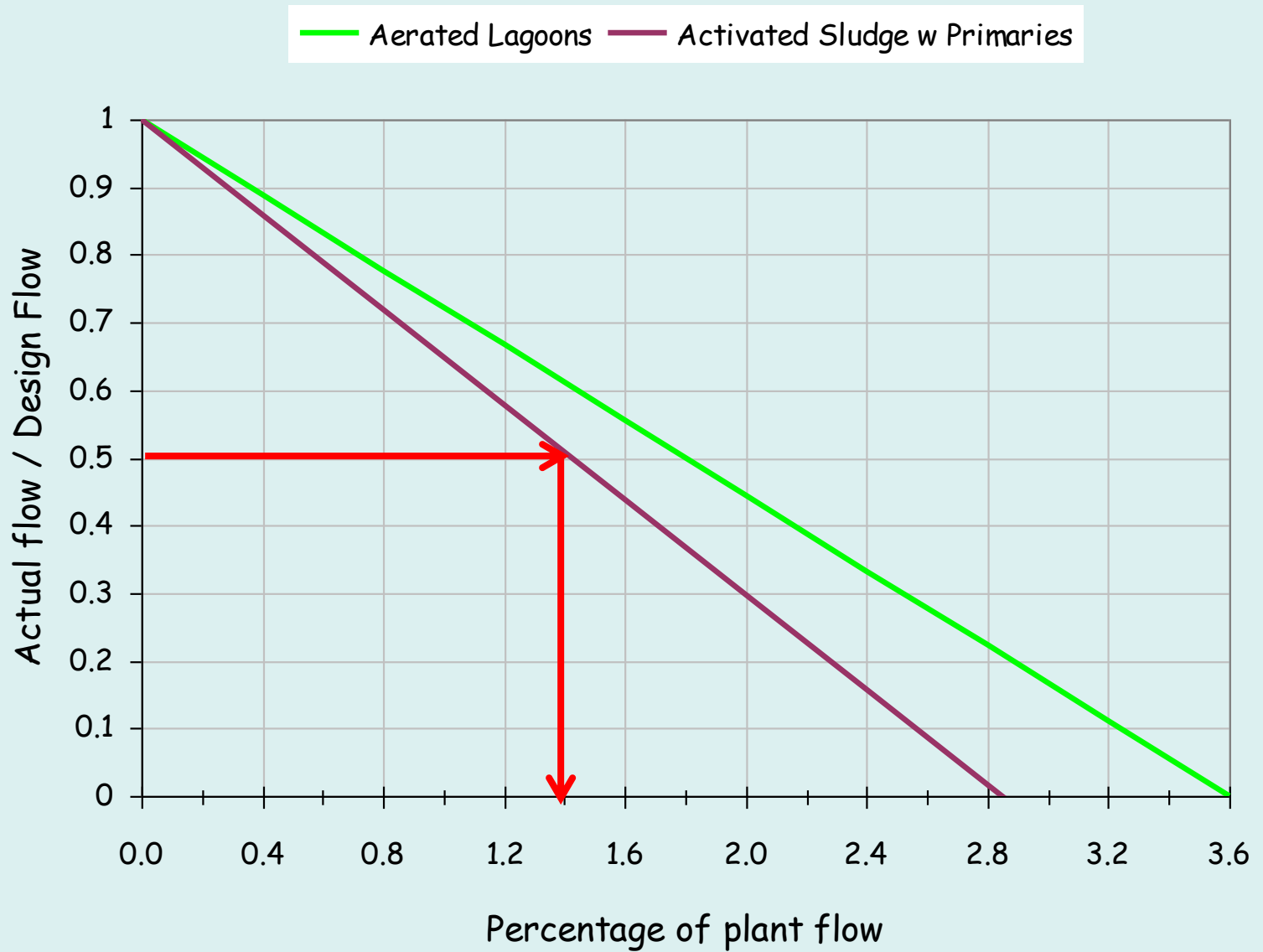


# Septage Loading Rate

- From graph
- Acceptable percentage  $\cong 1.8\%$
- Design flow = 150,000 gpd
- Septage flow  $\cong 150,000 \text{ gpd} \times 1.8\%$
- Septage flow  $\cong 2,700 \text{ gpd}$



# Allowable Septage (EPA 1994)



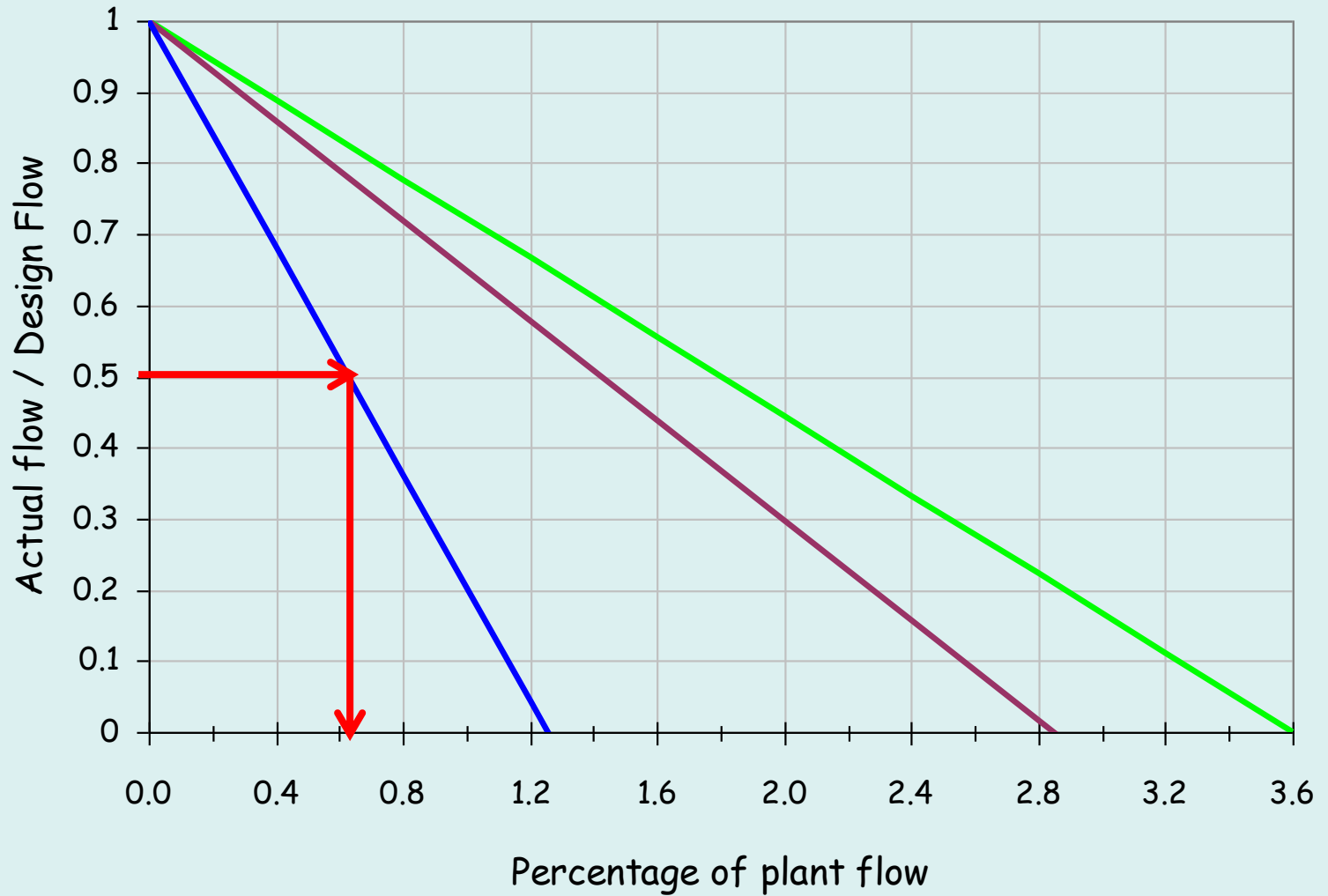
# Septage Loading Rate

- From graph
- Acceptable percentage  $\cong 1.4\%$
- Design flow = 150,000 gpd
- Septage flow  $\cong 150,000 \text{ gpd} \times 1.4\%$
- Septage flow  $\cong 2,100 \text{ gpd}$



# Allowable Septage (EPA 1994)

— Aerated Lagoons — Activated Sludge w Primaries — Activated Sludge w/o Primaries



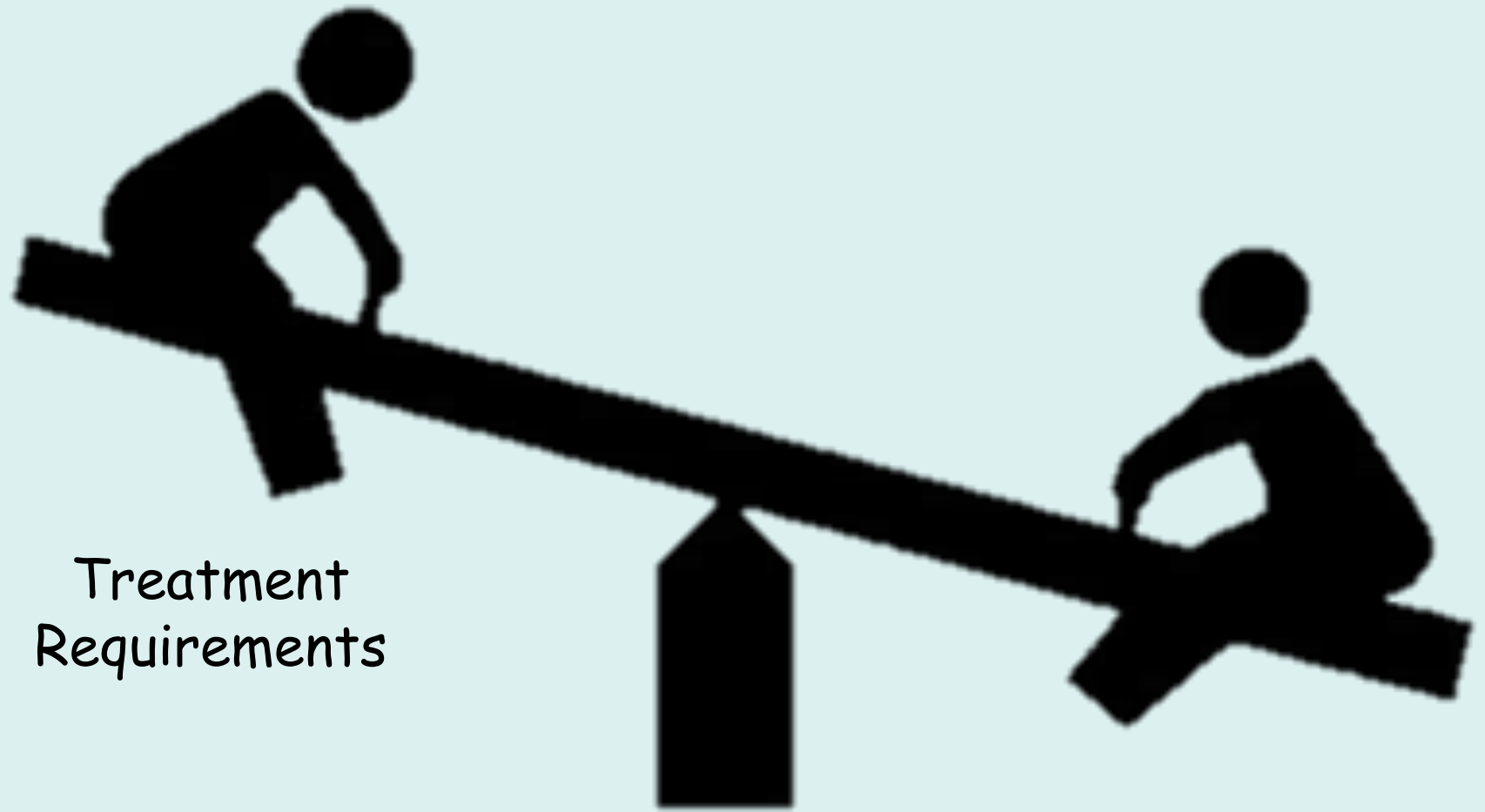
# Septage loading rate

- From graph
- Acceptable percentage  $\cong 0.6\%$
- Design flow = 150,000 gpd
- Septage flow  $\cong 150,000 \text{ gpd} \times 0.6\%$
- Septage flow  $\cong 900 \text{ gpd}$



# Plant's Issues

- Not 1970s
- BOD = 5 mg/L
- TSS = 5 mg/L
- TP = 1 mg/L
- TN = 3 mg/L
- New Technologies



Treatment  
Requirements

Treatment Plants  
Taking Septage





**NO Septage**

# Plant's Issues

- Costs
- \$40 month
- BOD load (household of 4)  $\approx$  30 lbs
- BOD  $\approx$  \$1.33/lbs

# Septic Owner's Issues

- Costs
- Tank Pumped = \$500
- BOD load (household of 4)  $\approx$  54 lbs
- BOD  $\approx$  \$9.26/lbs



# Impact to Plant

- 2000 gallons
- $\text{NH}_3$  - 1.6 lbs
- BOD - 108 lbs
- TSS - 215 lbs
- Cu - 1.2 lbs



N

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Image State of Utah

Imagery Date: Mar 5, 2006

39° 31.657' N -111° 28.973' W elev 0 ft

Eye alt 4967 ft






©2008 Google

Image State of Utah

Imagery Date: Mar 5, 2006

39° 31.562' N 111° 28.985' W elev 0 ft

Eye alt 170 ft 



# Land Application

# Land Application

- It is allowed !!
- Domestic ONLY
- EPA 40 CFR 503
- In con-junction with Local Health
- Records - Records - Records

# Land Application - Records

- Location - Lat, Long
- Site Size
- Dates and TIMES
- Loading Rate
- Gallons Applied
- Pathogen Reductions
- Vector Attraction Reductions
- SIGNED Certification



# Land Application - Pathogens

- Direct Application
  - Crop Restrictions (30 day - 38 month)
  - Grazing Restrictions (30 day)
  - Site Restrictions (30 day)
- pH > 12 @ 30 Minutes
  - Crop Restrictions
  - ~~- Grazing Restrictions~~
  - ~~- Site Restrictions~~

# Land Application - Vectors

- Direct Injection
- Till Soil Within 6 Hours
- pH > 12 @ 30 Minutes





















# Land Filling



# Land Filling

- Solid Waste - Not Liquid
- EPA 40 CFR 257
- Class I Landfills
- Paint Filter
- "Drying Beds"













# Strater-gery

- State wide issue
- Who will regulate ?
- Will serve letter with business license ?
- 3 Ms
- Manage
- Manifest
- Mitigate
- Moratorium ?



# Questions

Are canceled do to the instructor  
just not caring anymore

