

# Utilizing Excess Capacity

Is it right for your facility?

# What is Excess Capacity?

- ▶ Facility planning is usually for 20 year growth
- ▶ How much extra capacity do you have?
  - Hydraulic loading
  - Organic loading
    - Solid and Liquid
- ▶ How much are you willing to rent out?

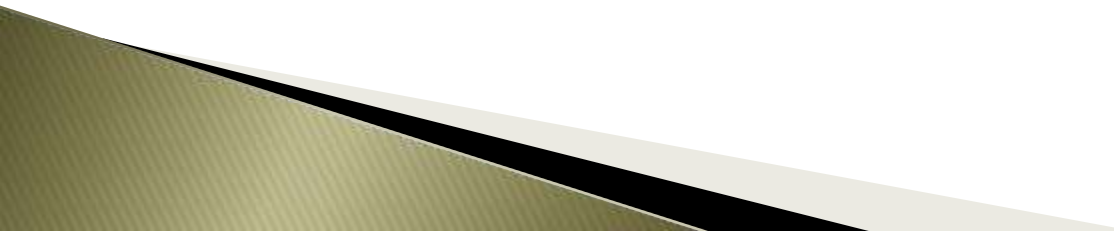
# Take Advantage of Current Infrastructure

- ▶ Fine Screens
  - Some wastes have foreign debris
- ▶ Flow Equalization
  - Metering in waste is always best
- ▶ Digestion
  - Anaerobic > Aerobic
- ▶ Biogas Utilization
  - Increased gas production
- ▶ Biological Nutrient Removal
  - Extra carbon and a good source of VFA's

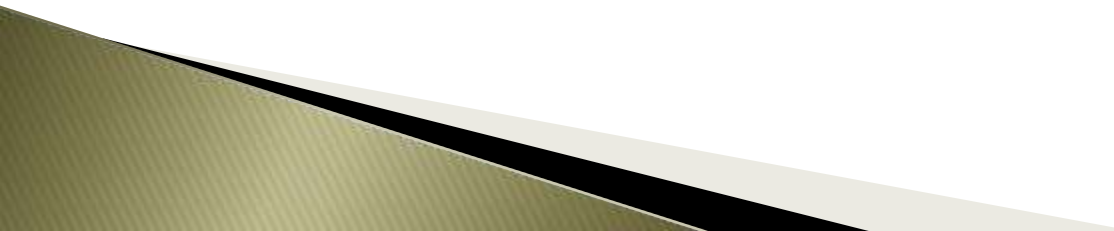
# Types of Wastes

- ▶ What is locally available
  - Septage, Holding Tank, Leachate, Others?
- ▶ Waste Haulers prefer WWTP's
  - Easier paperwork
  - No liming needed
  - No Trash clean up
  - No environmental factors

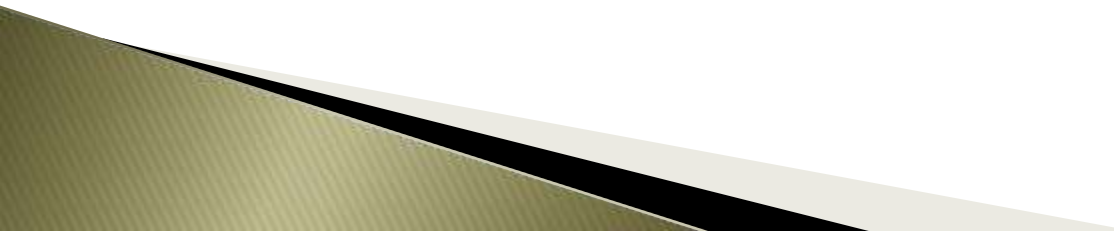
# Do your Homework

- ▶ Analytical Data for each waste
  - ▶ Truck Routes in your municipality
  - ▶ Utilize your capacity efficiently
  - ▶ Check for competition from other facilities
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# How do you implement it?

- ▶ Develop a business plan
    - Lab data, tipping fees
  - ▶ Get your governing body to agree to it
    - Discuss decisions with your board/commission
  - ▶ Start small with trust worthy haulers
  - ▶ Do a few weeks trial with reputable haulers
  - ▶ Revisit plan regularly
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# Program Oversight

- ▶ How are records kept?
  - ▶ Who does the billing paperwork?
  - ▶ How do you set your fees? Full trucks/honor system/ key card system/administrative or laboratory fees
  - ▶ Calculate fees, adjust to be competitive, choose wisely
- 



# Obstacles

- ▶ Heavy truck traffic
  - Possible complaints from residents
- ▶ Odors
  - Possible complaints from neighbors
- ▶ Foreign Debris
  - Can cause operational issues
- ▶ More variable waste stream
  - Harder to diagnose activated sludge problems

# Opportunities

- ▶ Tipping fees
  - Utilize Economies of Scale for higher profit/gallon
- ▶ Synergistic effects
  - The added waste can help your facility
    - Nutrients, stability of loading
- ▶ Increased Biogas production
  - Utilize the biogas for heat or power
- ▶ Environmentally friendly
  - WWTPs aren't looking to make a profit

# Stevens Point WWTP Case Study

## ► Plant Details

- 4.55 MGD (design)
  - 2.86 MGD (2016 average)
- EBPR
  - A/O with RAS Denite
- Anaerobic Digestion
  - Mesophilic (735,000 gal)
- Service Area
  - 27,000 Population
  - BOD Population Equivalent of 54,000

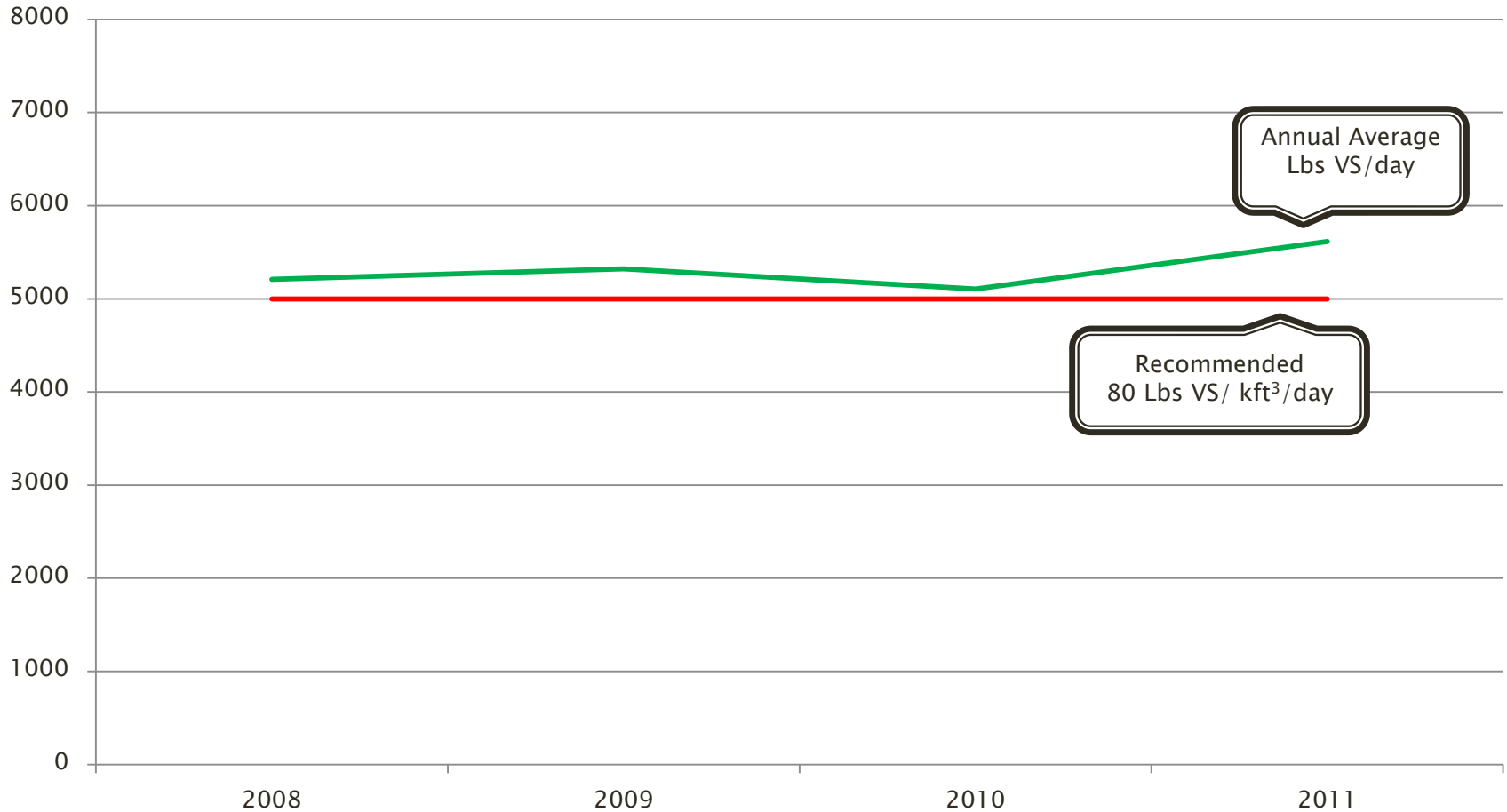


# Motivating Factors

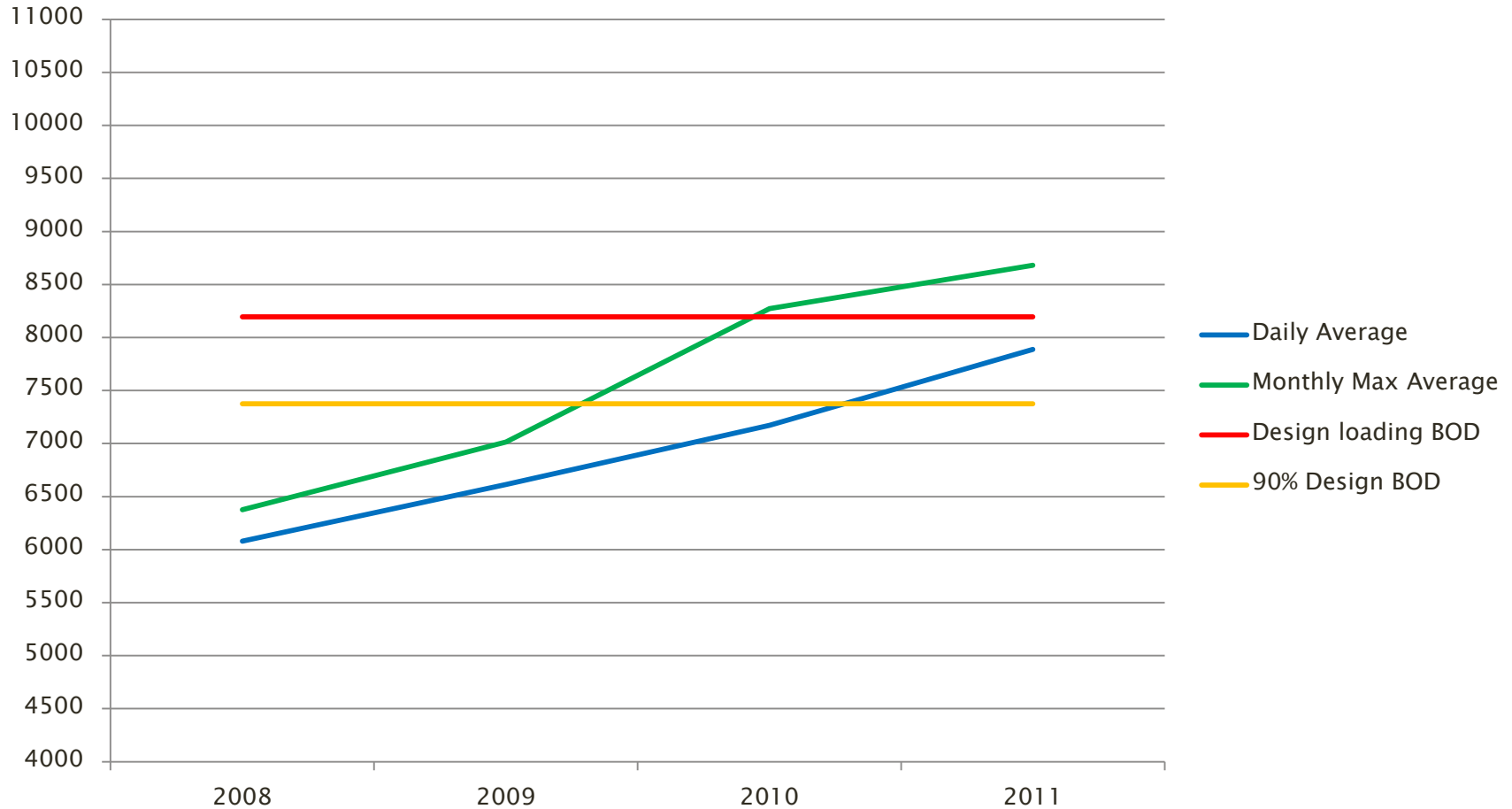
- ▶ Even out loadings
- ▶ Stabilize Bio-P process
- ▶ Increased biogas production
- ▶ Tipping Fee Revenue
- ▶ Best way as a region to handle the material



# Digester Loadings 2008 – 2011



# Plant Loadings 2008 - 2011



# 2012 Start of Hauled waste program

- ▶ Capacity Re-rate
  - Converted secondary digester to a primary digester
    - 428,000 gallons to 735,000 gallons (Mesophilic)
    - 8,196 lbs BOD/day to 10,400 lbs BOD/day
- ▶ Biogas Utilization Project
  - 180 KW biogas powered CHP
- ▶ Multiuse areas scum box/grit pad

# Digester Upgrade/Biogas Utilization



# Multi-purposing Equipment

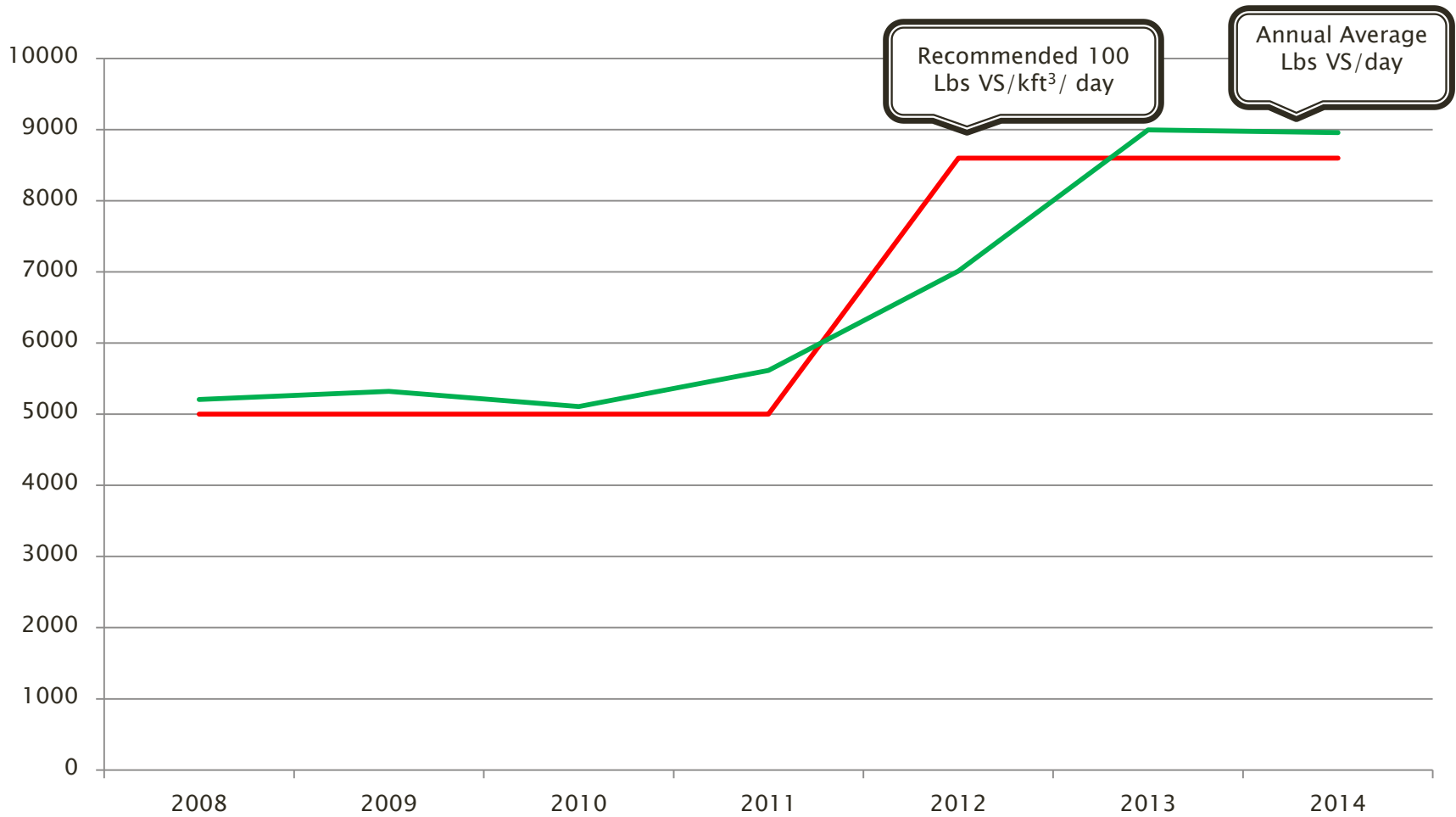


# Treating Waste Efficiently

## ▶ Plant Loadings vs Digester Feed

- Digester feed  $> 25,000$  mg/L BOD
  - Septage = 7,800 mg/L BOD
  - Holding = 3,700 mg/L BOD
  - Leachate = 250 – 3,500 mg/L BOD
  - HSW = 57,000 mg/L BOD
  - FOG = 4,000 – 60,000 mg/L BOD

# Digester Loading 2008– 2014



# Growing Pains



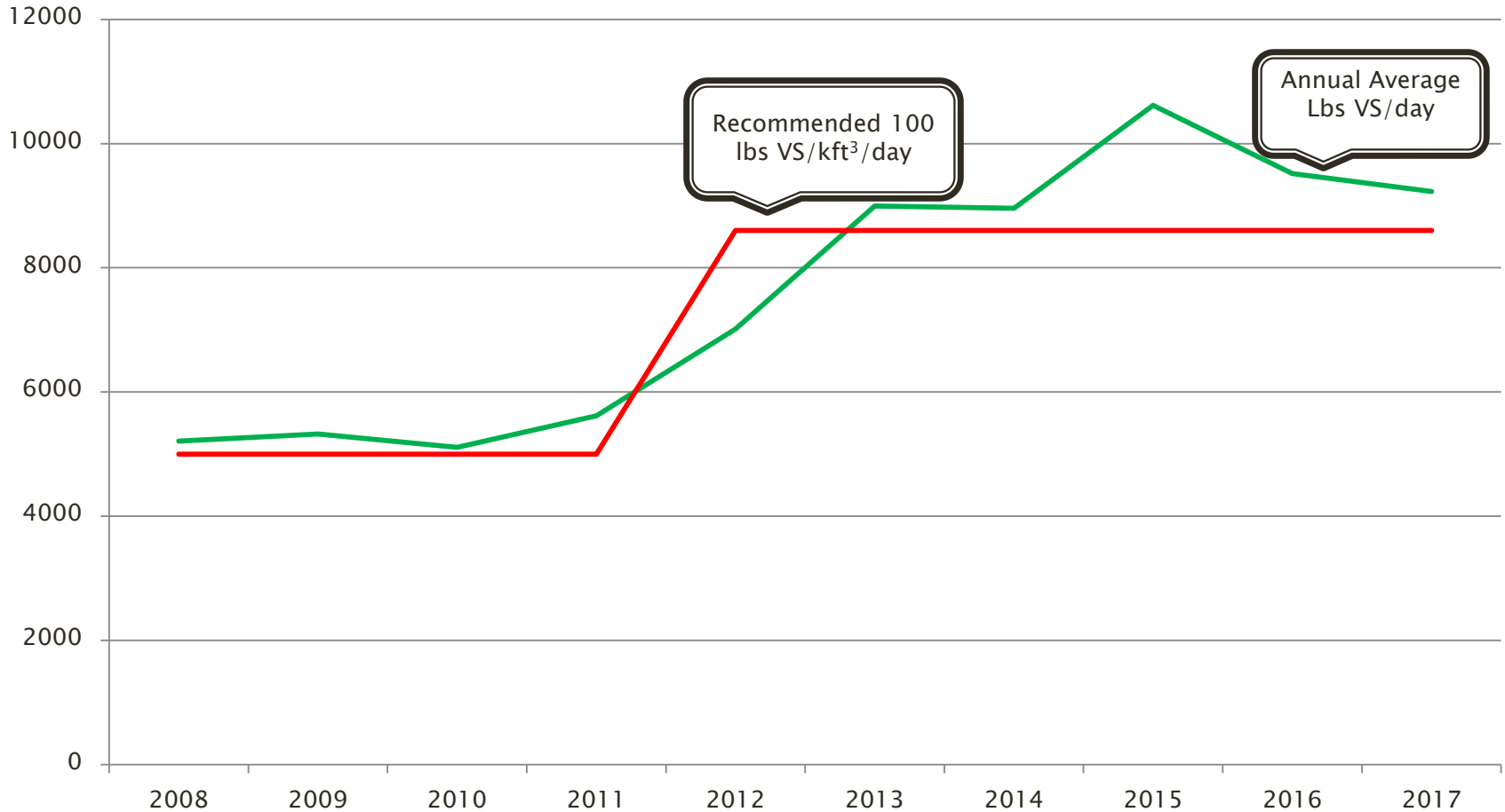
# Too Much of a Good Thing



# 2014 Brewery HSW project



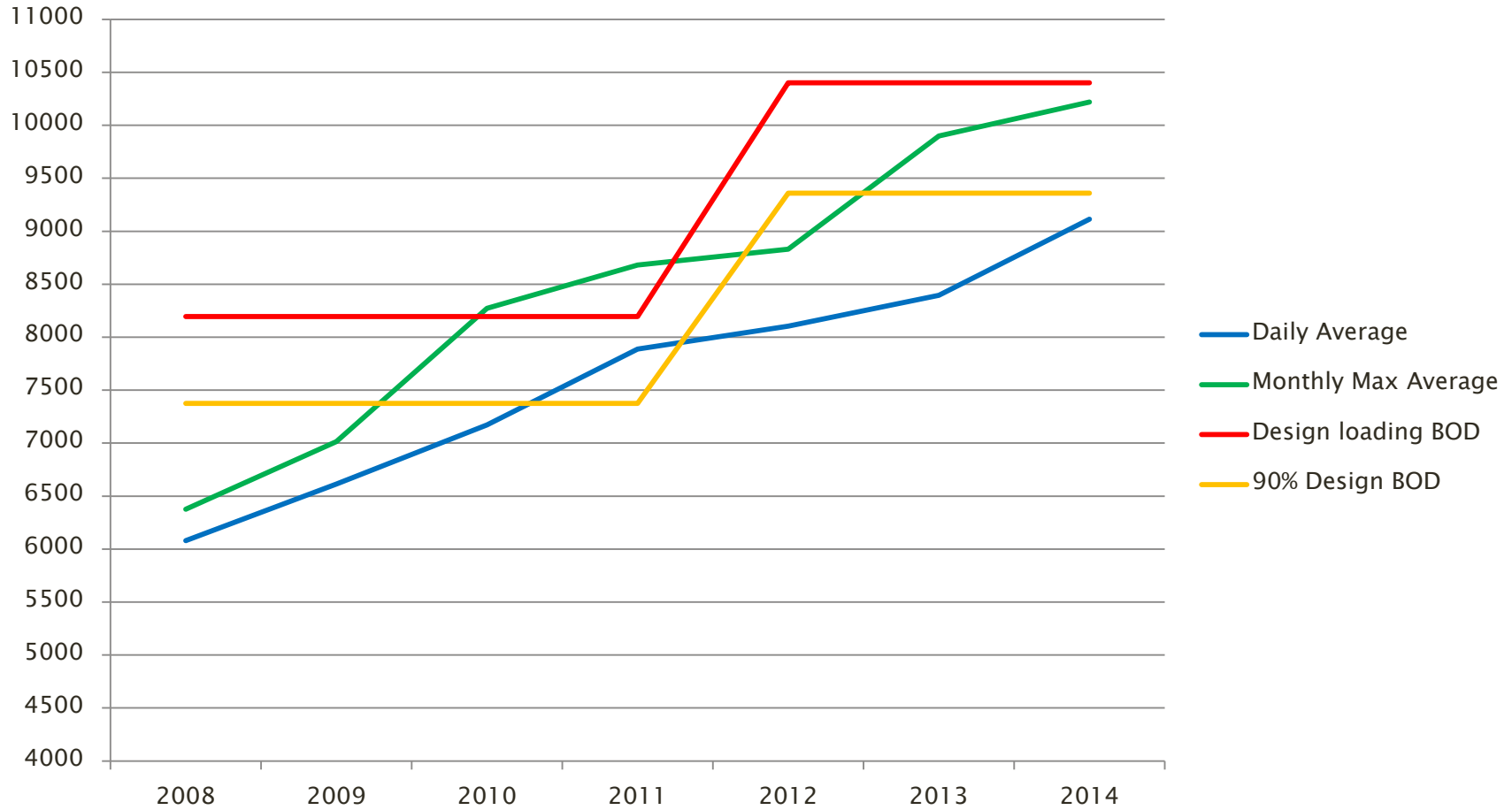
# Digester loadings 2008 – 2017



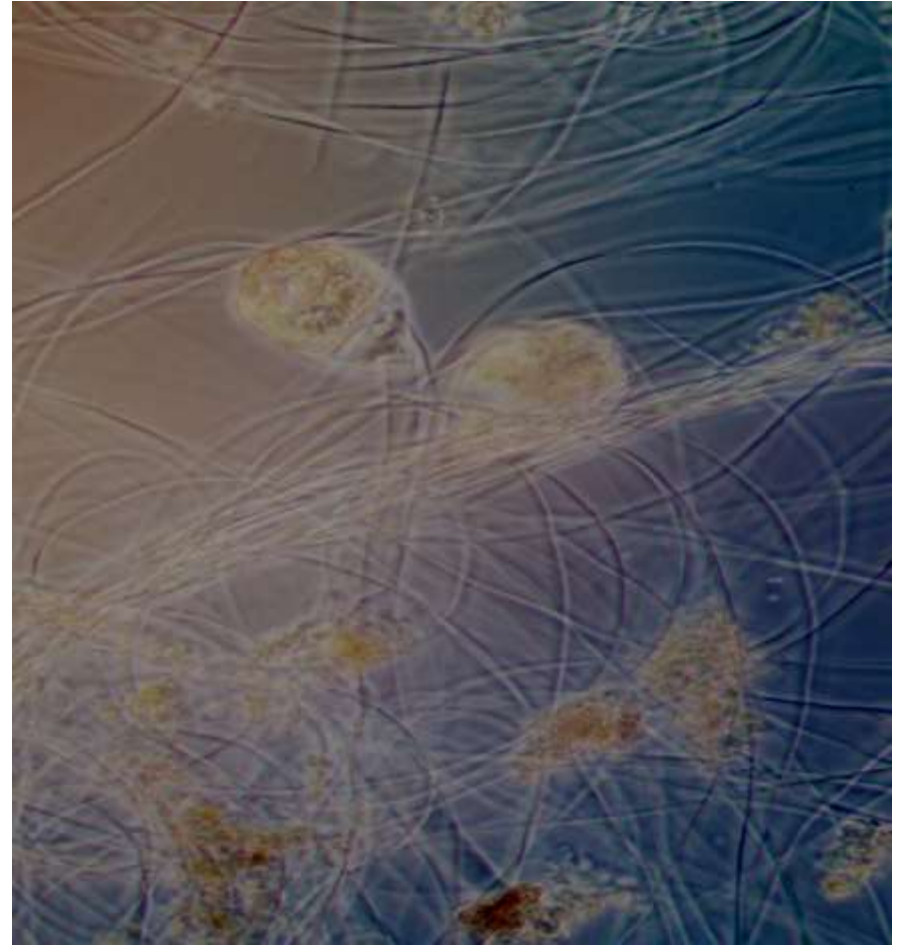
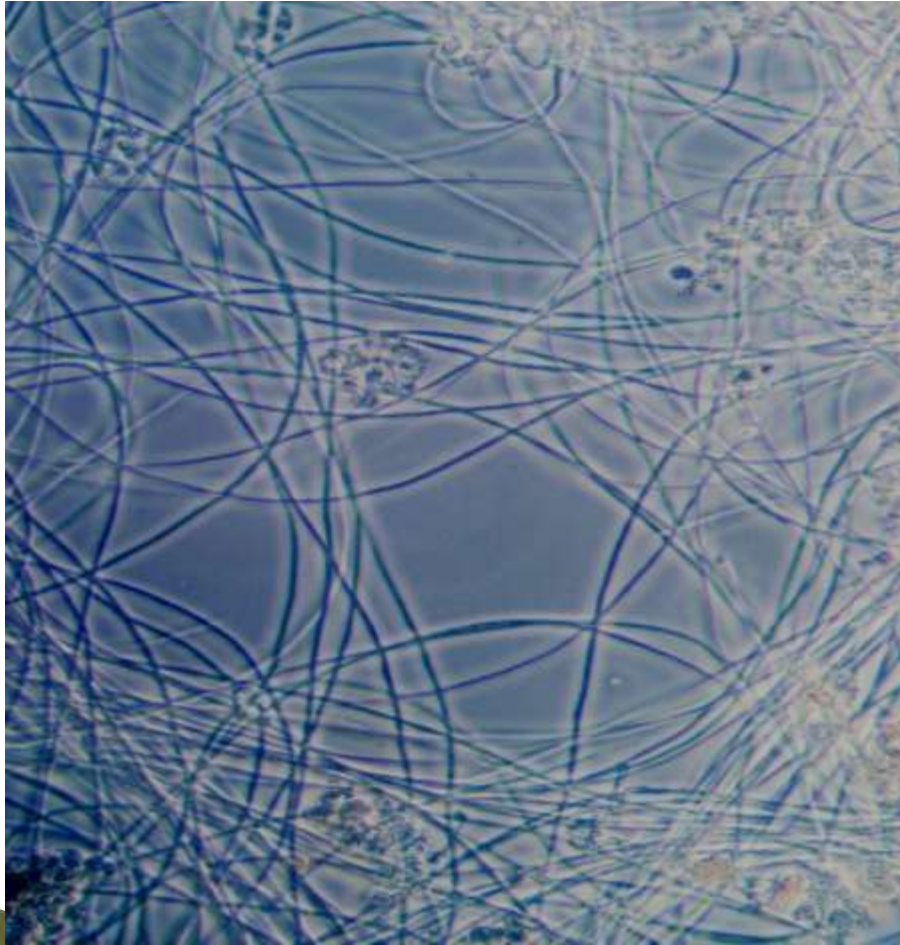
# Revisiting Our Plan

- ▶ Slug loading was causing loading rates in excess of 140 lbs VS/kft<sup>3</sup>/day
- ▶ Digester Hydraulic Detention time was dipping below 20 days (boilers reached maximum capacity at 17 days)
- ▶ HSW EQ tank stabilized loading
- ▶ FOG eliminated to increase detention time.

# Plant Loading 2008- 2014



# Learning Opportunities



Micrographs courtesy of MacDonald Environmental Services

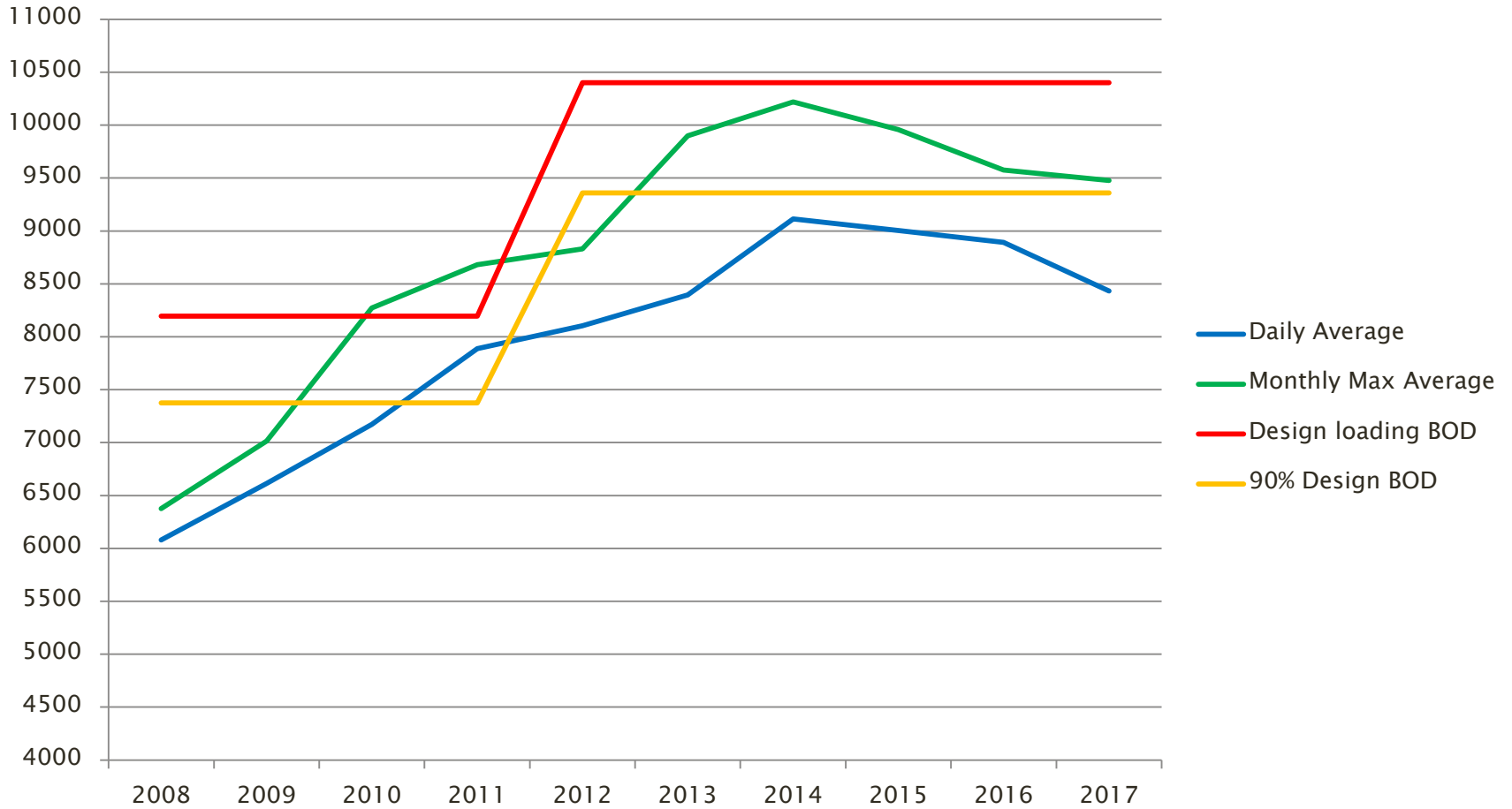
# Learning Opportunities



# Revisiting Our Plan

- ▶ 2014 Brewery HSW project
  - Removed over 500 lbs BOD/day
- ▶ 2016 Increased tipping fees
  - Increased septage fees by 36%
  - Increased holding tank fees by 86%
    - loadings changed less than 1%
- ▶ May 2017 limited haulers to single load/day
  - More allowed with permission

# Plant Loadings 2008 – 2017

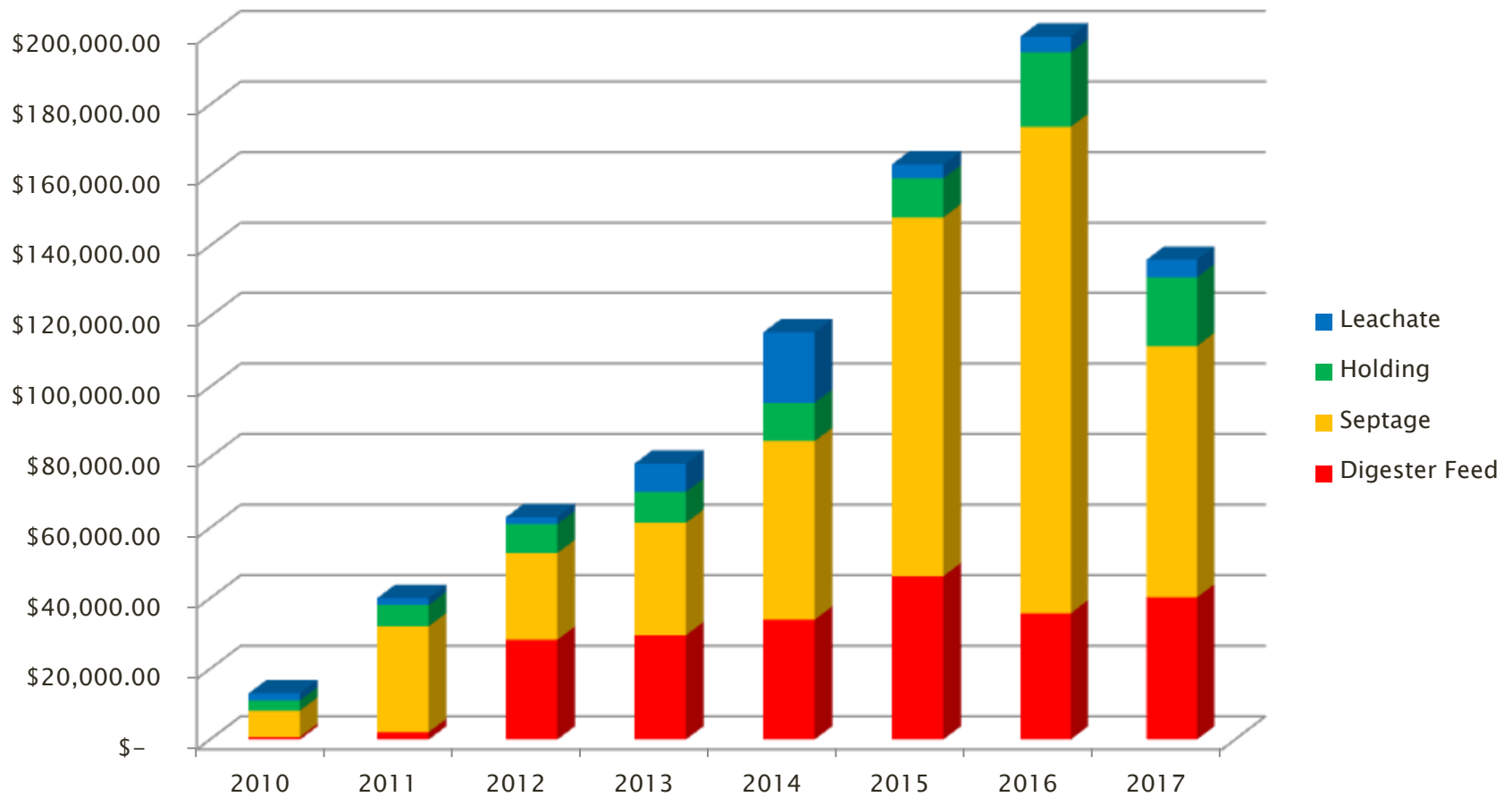


# Received Wastes in 2017

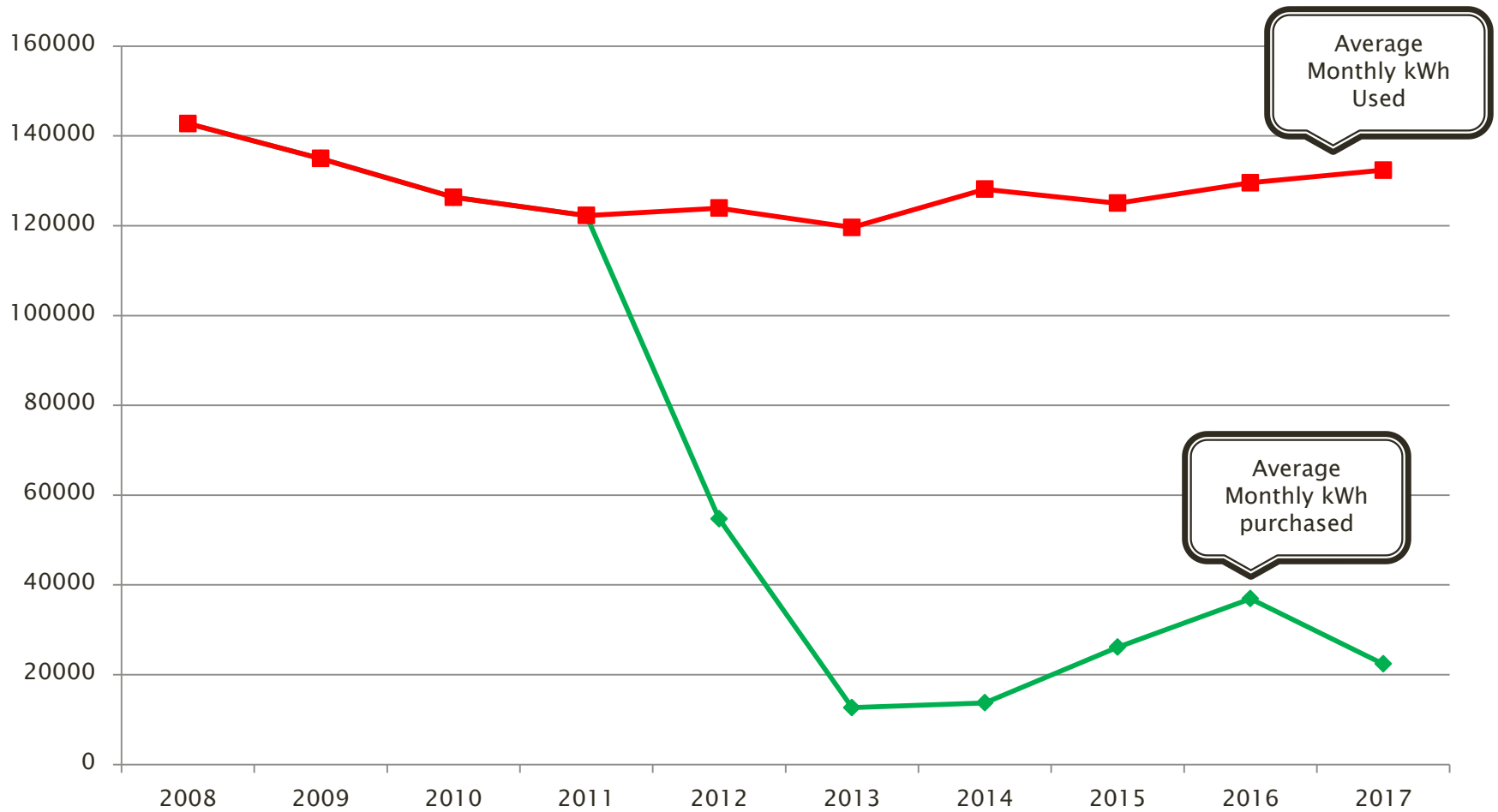
- ▶ **Septage**
  - 4628 gallons/day
  - 280 lbs BOD/day
  - 396 lbs TSS/day
- ▶ **Holding**
  - 5288 gallons/day
  - 112 lbs BOD/day
  - 173 lbs TSS/day
- ▶ **High Strength**
  - 8415 gallons/day
  - 5085 lbs BOD/day
  - 3506 lbs TSS/day



# Annual Financial Breakdown



# Monthly kWh Usage 2008 – 2017



# Meeting Goals

- ▶ Even out loadings
- ▶ Stabilize Bio-P process
- ▶ Increased biogas production
  - 50,000 ft<sup>3</sup>/day to 110,000 ft<sup>3</sup>/day
- ▶ Tipping Fee Revenue
  - Estimate for 2017 = 7% of our Annual WWTP Budget
- ▶ Best way as a region to handle the material



Thank you

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