

Overcoming the Challenges of High Strength Waste in OSTDS - Panel Discussion

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All materials in this presentation represent the speakers' opinions and do not reflect the opinions of NOWRA.

What we saw in the past ...

- ▶ Analyzing Wastewater Treatment Systems - CIDWT/AgriLIFE EXTENSION, Texas A&M System

Table A.6 Characteristics (average range of values) of restaurant wastewater*.

Parameter	Chinese Restaurant	Western Restaurant	American Fast food	Student Canteen	Bistro
BOD ₅ (mg/L)	58-1430	489-1410	405-2240	545-1630	451-704
TSS (mg/L)	13.2-246	152-545	68-345	124-1320	359-567
FOG (mg/L)	120-172	52.6-2100	158-799	415-1970	140-410

* After Chen et. al. 2000.

What we see now...

Puckett's Restaurant

(meat & three type restaurant, country store & music venue)

Septic Tank Sampling - two different times

	1/31/2013	2/14/2013
BOD	2,340 mg/L	2,210 mg/L
TSS	212 mg/L	83.3 mg/L
FOG	56.1 mg/L	56.9 mg/L
pH	5.39	5.00

New Store - Gas Station Convenience Store with Full Service Coffee Shop (with drive-thru)

New system design parameters

(grease trap, septic tank, recirc. tank, AquaPoint AquaCell MBBR & Bioclere trickling filter, pump tank to MLPP dispersal)

	Average	Peak
BOD	1,600 mg/L	2,200 mg/L
TSS	200 mg/L	300 mg/L
FOG	60 mg/L	80 mg/L
TKN	50 mg/L	175 mg/L
pH	5.0	7.0

Across 2 Creeks Restaurant & Jammery

(full service restaurant facility and separate commercial jammery/canning kitchen facility for processing on-site grown fruits & vegetables with additional cooking demonstration kitchen)

New system design parameters

(2 separate grease trap tanks for each building; 2 separate septic tanks for each building; 1 co-mingled EQ tank; 2 parallel AquaPoint AquaCell MBBR's & 2 Bioclere trickling filters for each MBBR; 1 co-mingled pump tank to MLPP dispersal)

FLOW	5,000-gpd
BOD	2,200 mg/L
COD	4,000 mg/L
TSS	500 mg/L
FOG	800 mg/L

Why the
difference?

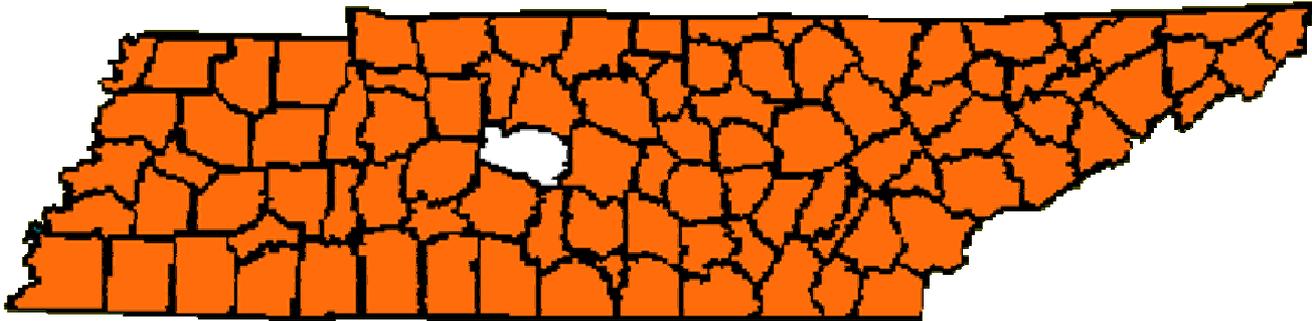




and NOW!!!

Williamson County

Located in Middle TN; south of Nashville



Winery

Arrington Vineyards



Winery

Passive Settling Tanks



Winery

Filters in All Tanks



Winery

*BioCOIR
Media Filters*



Winery

BioCOIR ~ Coconut Husk Fibers



Winery

Final Grading of Tanks & Modules



Winery

Filter Maturity & Effluent Quality



Winery

Biological Growth in BioCOIR Module



Winery

Clogged COIR Media ~ Ponding & Removal



Winery

New System ~ MBBR



Winery

New System ~ Trickleing Filter (effluent polishing)



Things we
learned...

Distillery

*George Dickel ~
Larger Facility*





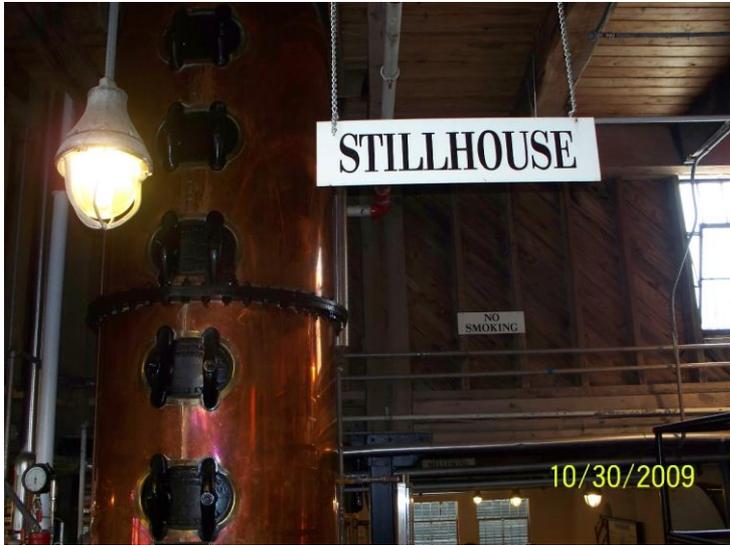
George
Dickel

Grain Milling

George Dickel

*Fermentation Mash
Tanks*





George
Dickel

*Column
Still &
Mellowing
Tank*

George Dickel

Barrel House



George Dickel

Stillage (livestock feed)



15,600-gal

Distillery

*Limestone Branch (KY)
Craft Distillery
(small)*



Limestone Branch (KY)

Mash Cooker & Fermentation Tanks



Limestone Branch (KY)

Smaller Scale



Limestone Branch (KY)

Grain Residue & Floor Drains



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Limestone Branch (KY)

Pot Still



Limestone Branch (KY)

Tasting Room & Gift Shop



Distillery

Leiper's Fork (TN) ~ Craft Distillery





Leiper's Fork (TN)

Still House & Welcome Center



Leiper's Fork (TN)

*Pot Still &
Small Column
Still*



Leiper's Fork (TN)



► *Floor
Trench
Drain &
Barrel
Decanting*

A photograph of an outdoor dining area at dusk. Several people are seated at wooden picnic tables on a grassy lawn. A large red patio umbrella is open over one of the tables. In the background, there are trees and a string of warm white lights hanging across the scene. The sky is a mix of soft pinks, oranges, and blues, indicating sunset. The overall atmosphere is relaxed and social.

Leiper's Fork (TN)

*Large Special
Events*

*(Public Restrooms or
Portable Facilities?)*

The importance of doing
your homework before the
design...

...same processes but the
difference is in the details!!

Convenience Markets

Number of Pump Islands ~ Number of Transactions



Convenience Markets

*Proximity to
Interstate*



Convenience Markets

Grab N' Go

GRAB N' GO
FRESH, COOL AND READY

JUICE ENERGY





Convenience Markets

Self-Serve Fountain Drinks

~ Drain Trays



Convenience Markets

Tea & Cappuccino



Convenience Markets

*Hot Dog Rollers
Biscuits & Hot
Sandwiches*



Convenience Markets

*Donuts,
Pastries &
Bakery Goods*



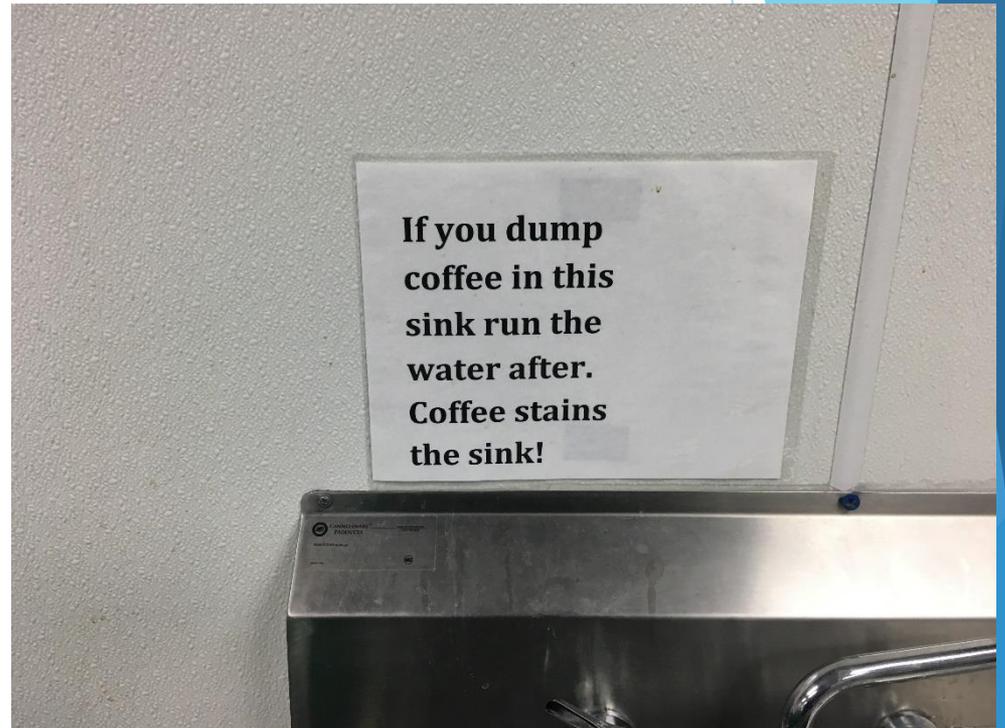
Convenience Markets

Coffee.....Coffee.....and more Coffee



Convenience Markets

Fresh Coffee



*Drive Thru ~ Specialty
Coffee Shop*

Convenience Markets



Convenience Markets

Drive-Thru Coffee Shop



Convenience Markets

Specialty Coffee Shop



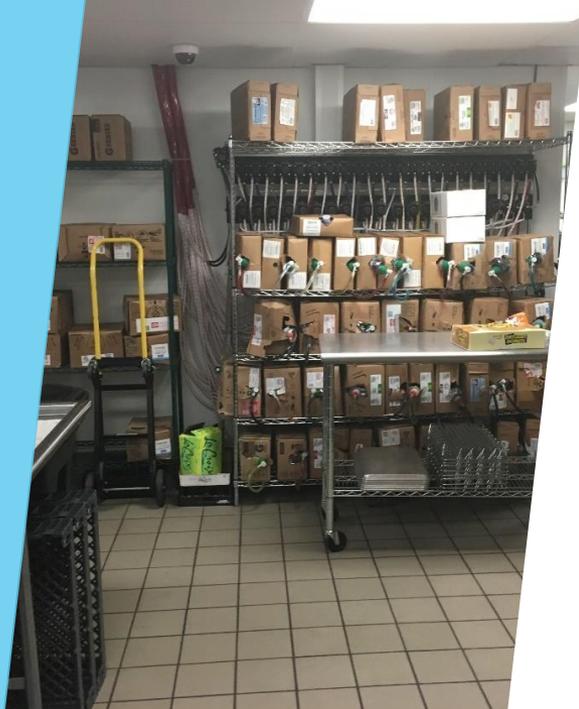
Convenience Markets

Specialty Coffees



Convenience Markets

*Behind the Scenes
Cooking / Kitchen
Equipment*



Convenience Markets

*Cooking /
Kitchen
Equipment*



Convenience Markets

Food Prep/ Assembly



Convenience Markets

Floor Drains



Convenience Markets

*Three Basin Sink ~
Wash, Rinse & Sanitize*



Convenience Markets

*Mop Basin
Chemical Feed*



Convenience Markets

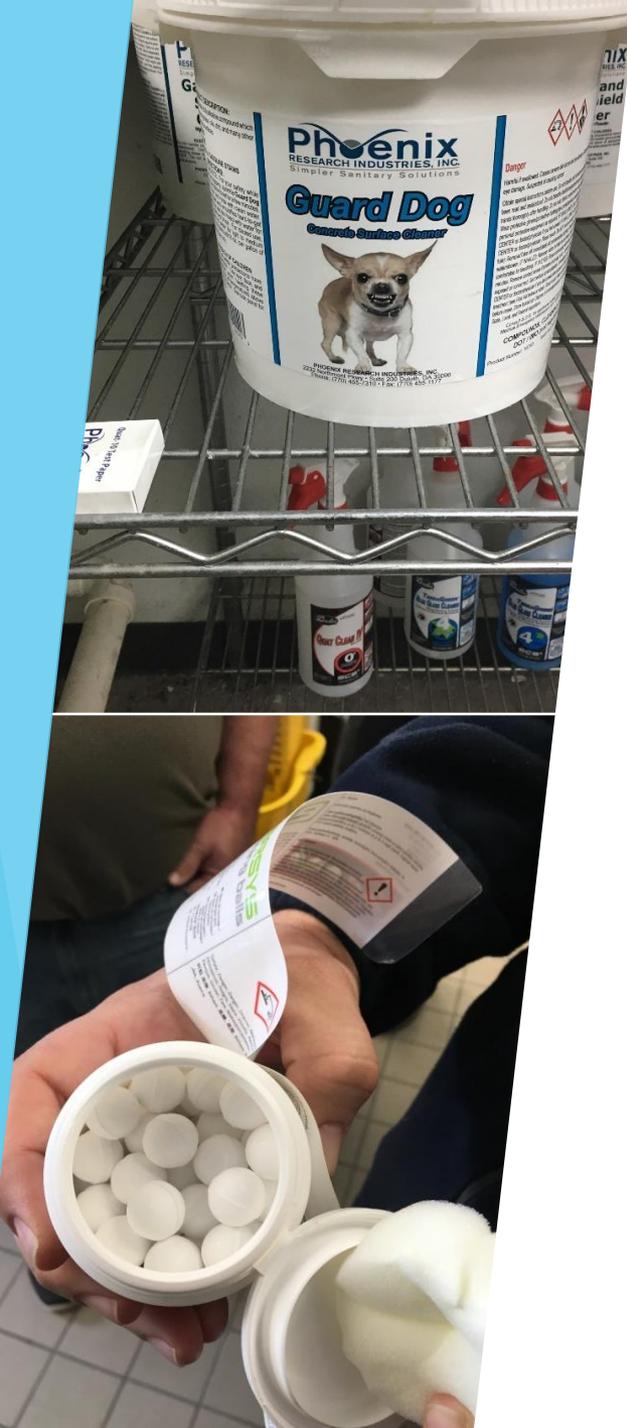
*Cleaning Supplies
Quaternary Ammonium*



Convenience Markets

Cleaning Supplies

*Concrete Surface Cleaner
& Sanitizer Tablets*



Convenience Markets

*Restrooms ~
Automatic Plumbing
Fixtures*



Convenience Markets

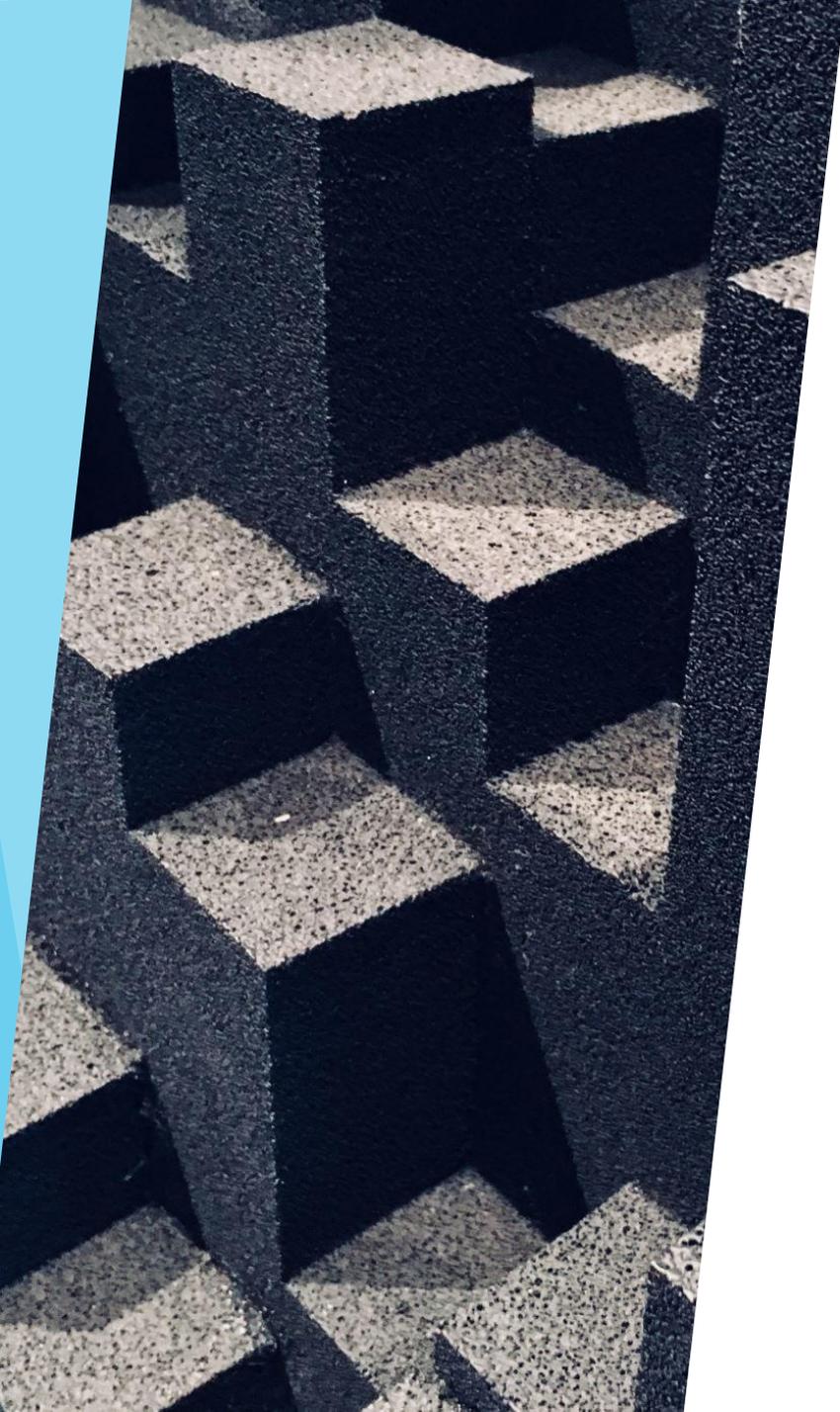
*Restrooms ~
Automatic
Plumbing Fixtures*



Convenience Markets

*Restrooms ~
NO PAPER
TOWELS*





So many design
considerations



Convenience Markets

*Big Tanks &
Grease
Interceptor*



Convenience Markets

MBBR & Trickling Filter

A large green and yellow cylindrical tank is being lowered into a deep excavation pit. The tank is suspended by a crane and is partially submerged in water at the bottom of the pit. Several workers are visible around the pit, including one on a ladder on the left and another on a small platform on the right. The pit is surrounded by dirt and construction equipment.

Convenience Markets

MBBR & Trickling Filter



Convenience Markets

MBBR & Trickling Filter



Convenience Markets

*MBBR (aggressive
aeration with
attached growth
media)*





Convenience Markets

Trickling Filters (2 media sizes) for effluent polishing



Convenience Markets

Trickling Filter



Convenience Markets

Air Compressors & Electrical



Convenience Markets

Electrical Control Shed



Convenience Markets

Final Grading & Fencing





Lessons
learned...

... things we'd
do different??

QUESTIONS/COMMENTS

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