



***East Bay Municipal Utility District***

# **EBMUD's Trucked Waste Program**

## **Making it Worth the Risk**

**Sophia Skoda, EBMUD  
Ray Goebel, EOA, Inc.**

# Presentation

- 💧 Trucked Waste Program Overview
- 💧 Waste Acceptance
- 💧 Environmental Benefits
- 💧 Program Challenges
- 💧 Future Direction for Program
- 💧 Summary

# Wastewater Treatment Plant

- 💧 Secondary treatment for up to 168 MGD
- 💧 Currently, treating 80 MGD
- 💧 Significant excess capacity
- 💧 Industrial base declined dramatically over 10-15 years
- 💧 Bay water discharge



# Trucked Waste Overview

- Scope of Program
  - Acceptance of waste by truck (or rail)
  - Energy generation
  - Environmental benefits
- Opportunity to make use of excess capacity by providing a local and economical disposal alternative



# Trucked Waste Program Overview

- Originally created for: trucked septage and fats, oil, and grease (FOG)
- Additional waste streams added: food processing and high salinity wastes
- High strength wastes, such as food scraps, added directly to digesters increase methane production
- High salinity waste acceptance benefits the CA Delta system
- Pilot project for FOG → Biodiesel
- Developing large scale food scrap program

# Trucked Waste Acceptance Process

The steps:

1. Waste characterization
2. Waste evaluation
3. Permitting
4. Load & waste tracking
5. Site orientation
6. First load confirmation sample
7. Field audit program

# Trucked Waste Acceptance Process

Rigorous 7-step procedure designed to:

- Protect workers at the WWTP
- Meet operational needs including:
  - Process considerations
  - Odors
  - Biological systems
- Ensure compliance with all environmental permits and regulations (NPDES, air, biosolids, and pretreatment)

# Program Regulatory Foundation

- ◆ EPA Guidance Manual - 1999
  - “Guidance Manual for the Control of Wastes Hauled to Publicly Owned Treatment Works”*
- ◆ Pretreatment – 40 CFR 403
- ◆ Safety - OSHA
- ◆ Water - NPDES
- ◆ Biosolids – 40 CFR 503
- ◆ Air - Title 5

# Local Limits - MAHL Mass Balance

Industrial	Maximum Allowable Headworks Loading
+ Commercial	
+ Residential	
+ Safety Factor	
Balance = Available	

# **Waste Acceptance / Load Allocation Methods - Three Models Evaluated**

1. Apply Concentration Based Local Limits to Trucked Waste Users
2. Fixed Mass Allocation
3. Dynamic Mass Allocation

# Trucked Waste Acceptance Tools

- 💧 Trucked waste impact software simulation tools for process and regulatory parameters
- 💧 Truck Track provides controls for deliveries, waste tracking, and operations uses
- 💧 Operations indicators

# Waste Impact Simulation Tool

**TWIST - [MainForm : Form]**

File Edit View Insert Format Records Tools Window Help

MS Sans Serif 8 B I U

Type a question for help

## TWIST: Trucked Waste Impact Simulation & Tracking Database

Permitted Load Characteristics Waste Type Templates Procedures Plant Alerts Plant Capacity Used Date Summary

Search by Permit Number: FOFA2208-001 OR Search by Name:

Permit Number: FOFA2208-001 Expiration Date: 5/31/2009 Issue Date: 6/1/2002

Company: 26 Foster Farms

Project Name: Poultry Waste

Permitted Wastes

Waste Type	Disposal Location	S	W	M
Poultry Blood	R2 High Strength Station			

Record: 1 of 1

Characteristics for these Loads of: Poultry Blood

Use Template

Analyte	Value	Units
Ammonia Nitrogen as N	956.00	mg/L
Arsenic	870.00	ug/L
Biochemical Oxygen Demand	60,561.00	mg/L
Calcium	129.03	mg/L
Chemical Oxygen Demand	137,803.00	mg/L
Chromium	524.70	ug/L
Copper	1,557.00	ug/L
Iron	290,228.00	ug/L
Magnesium	49,968.00	ug/L
Nickel	244.00	ug/L
Potassium	1,624.61	mg/L
Silver	526.00	ug/L
Sodium	2,282,353.00	ug/L
Total Kjeldahl Nitrogen (as N)	13,872.00	mg/L

Record: 1 of 17

Load Alerts for this Waste Type caused by high concentration: Poultry Blood

Analyte	Value	LimitType	Co	Limit	Units
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Form View

NUM

# Truck Track

- ◆ A multifaceted tool:
  - Control mechanism at gate for Security Officer to ensure only authorized drivers, tankers, and permitted wastes enter the plant.
  - Software tracks waste types, volumes, loadings, and other parameters for use in:
    - Operational
    - Inspection
    - Financial and management decisions

# Truck Track Homepage

Truck Track Home Page - Microsoft Internet Explorer

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Address <http://wastewater/R2/cgi-bin/Default.cfm> Go Links

Links: [Home](#) | [Reports](#) | [Log In](#) | [Help](#)

**Truck Track Home Page** July 3, 2006

**Logged In User:** Not Logged In **Role:** Unknown

### R2 Staff Phones

Name	Phones
<a href="#">Chris Smith</a> Senior Wastewater Control Insp Truck Coordinator	CR 510.385.6158 V 510.287.1630 Radio Sign: 7040
<a href="#">Heidi M Benenson</a> Senior Environmental H&S Spec	CR 510.774.6090 V 510.287.1264 Radio Sign: 246
<a href="#">Marie A Kulka</a> Wastewater Control Rep Permits & Insurance	V 510.287.1632
<a href="#">Sophia D Skoda</a> Senior Civil Engineer R2 Program Manager	CR 510.774.6091 V 510.287.1542 Radio Sign: 247

CR=Cell  
PG=Pager  
V=Voice

### Message of the Day

*Last Updated June 30, 2006 by rcsmith*

**R2 24 hour Standby for the period  
6/20 PM to 7/5 AM  
is Heidi Benenson (510)774-6090.**

**Inspector on duty from  
Monday 7/3 to Friday 7/7  
(business hours) is  
\*\*\* Chris Spencer \*\*\***

### Trucks Currently onsite:

Ref	Time In	Disposal Location	Update
74491	07/03/06 12:56 PM	Septage Stations A	
Far West Sanitation, 5000 gal. (Farwest #8455)			
74492	07/03/06 01:07 PM	Septage Stations A	
Homen Trucking, 5000 gal. (Hilmar #T-14)			
74493	07/03/06 01:14 PM	Septage Stations A	
Far West Sanitation, 1000 gal. (Farwest #5358)			

Done Local intranet

# Tracking Companies

**Edit Companies Table - Microsoft Internet Explorer**

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Address [http://wastewater/R2/cgi-bin/R2Only/edit\\_companies.cfm?action=Edit&vCompany\\_ID=71](http://wastewater/R2/cgi-bin/R2Only/edit_companies.cfm?action=Edit&vCompany_ID=71) Go Links

Links: Home Reports Authorize Disposal Transactions R2 Activities Reference Tables R2 Insp. Aging Rpts Log Off Help

**Edit Companies Table** October 4, 2007 9:20 AM

Logged In User: Heidi M Benenson Role: ADMIN

### Edit Company

Company Name (ID 71) \* Los Angeles Chemical/Brenntag

FIS ID LOAN3000

Base Permit Created 03/11/2004

Base Permit Expires 06/30/2009

**General** Primary Contact Billing Dispatch/Facility/Sales

Active ☒ Y ☐ N

Waste Generator ☐ Y ☒ N

Hauler ☒ Y ☐ N

Broker ☐ Y ☒ N

Owner-Operator ☐ Y ☒ N

General Liability Ins. Expires 01/01/2008

☒ General Liability on EBMUD form

Auto Insurance Expires 01/01/2008

☒ Auto Insurance on EBMUD form

Workmans Comp. Ins. Expires 01/01/2008

☐ Workmans Comp. Ins. on EBMUD form

Insurance Comments

Done



\* Permit applications  
signed by Chief Executive  
Officer of Company

# Tracking Drivers

**Edit Drivers Table - Microsoft Internet Explorer**

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**Edit Drivers Table** October 4, 2007 9:21 AM

Logged In User: Heidi M Benenson Role: ADMIN

**Edit Drivers Table for Bu**

[Add New Drive](#)

Last Name	First Name	Active	Septage	- Site			
Ambriz	Rafael	Y	N				
Askew	John	Y	N				
Avalona	Jesus	Y	N				
Avalos	David	Y	Y				
Baer	William	Y	N				
Bailey	James	Y	N				
Ballagon	Andrel	Y	Y				
Bauer	Michael	Y	Y				
Bernardo	Joey	Y	Y				
Cannady	John	Y	Y				
Carranza	Carlos	Y	N				
Chavez	Marcos	Y	Y	N	Y	N	 
Cisneros	Arturo	Y	Y	N	N	N	 
Cobos	Josh	Y	Y	N	N	N	 
Collodi	Tony	Y	N	N	N	N	 
Douglas	Montie	Y	Y	N	Y	N	 
Faafiti	Fala	Y	N	N	N	N	 



Done Local intranet

# Tracking Permits

**Maintain R2 Permits - Microsoft Internet Explorer**

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Address [http://wastewater/R2/cgi-bin/R2Only/edit\\_permits.cfm?action=Edit](http://wastewater/R2/cgi-bin/R2Only/edit_permits.cfm?action=Edit) Go Links

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**Maintain R2 Permits** October 4, 2007 9:16 AM

**Logged In User:** Heidi M Benenson **Role:** ADMIN

**Maintain R2 Permits**

Change Permit: FOFA2208-001 (Poultry Waste)

**Permit FOFA2208-001**

Permittee Company: Foster Farms (ID 26)

Active? ☒ Yes ☐ No

Permit Description (50 chars max) Poultry Waste

Permit Project City: None Listed

Permit Comment (120 chars max) Alert Shift Supervisor & Digester Operator of truck at

Permit Effective: 06/01/2002 through 05/31/2009

Waste Category: Poultry Blood (R2 High Strength Station) \$0.08

Company Permit is billed to: Foster Farms

Purchase Order No.:

Disposal Location if NOT default location: B941-0207-1/TRUCK BLOOD

Charge by Weight? ☐ No ☒ Yes

**Charge per gallon** **OR** **Charge Per Pound**

(if not default): \$ per Gallon (if charged by weight): 0.00595 \$ per pound

Optional default weight: pounds

**Rate Justification Comment (240 chars max)**

Agreement contract expires on June 30, 2008

\*Inactivate customer  
and truck not permitted  
into facility.



# Site Discharge Control

Site Loading Report - Microsoft Internet Explorer

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Address [http://wastewater/R2/cgi-bin/digester\\_load.cfm](http://wastewater/R2/cgi-bin/digester_load.cfm) Go Links

Site Loading Report

Logged In User: Heidi M Benenson Role: ADMIN



Disposal Location:
Recovery Tanks (RSI)
Scum Well Sed Tank
Septage Station B (N O2 Plant)
Septage Stations A
South O2 (OLD - use ID 6)

Start Date:
07/01/2006
Through:
07/03/2006

Site Loading Report for R2 High Strength Station  
between 07/01/2006 and 07/03/2006

Date/Time	Company	Description	Gallons	Tank Capacity	Pounds	Kg COD
07/01/2006				5,650		
07/01/2006				6,500	37,	
07/01/2006				6,500	37,	
07/02/2006				5,650	47,	
07/02/2006				6,500	37,	
07/02/2006				6,500	37,	
				37,300	196,	

Date Picker

# Waste Category Loading

7-Day Waste Category Disposal Summary - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://wastewater/R2/cgi-bin/R2Only/reports/wastecatsumm\_week.cfm

Customize Links Free Hotmail Windows Marketplace Windows Media Windows

Google Search

Logged In User: Sophia D Skoda Role: MGR

Starting: 11/06/2007

No. of days: 7

Include:

- ☐ Loads
- ☐ Gallons
- ☒ Kg COD
- ☐ Revenue
- ☐ Pounds
- ☐ Kg TS

Disposal location: Septage Station A

Excel? ☐ GO

7-Day Waste Category Disposal Summary  
Transactions Starting 11/06/2007  
Disposal location: Septage Station A

Date	Waste Category	Kg COD/Day
11/06/2007 Tue	Gray Water 0-75K TDS	4,076
11/06/2007 Tue	Process Water	1,744
11/06/2007 Tue	Septage	3,304
11/06/2007 Tue	Winery (Low strength)	648
11/07/2007 Wed	Gray Water 0-75K TDS	2,428
11/07/2007 Wed	Gray Water 75-200k HighStrengt	324
11/07/2007 Wed	Pharmaceutical	33
11/07/2007 Wed	Process Water	541
11/07/2007 Wed	Septage	2,249
11/07/2007 Wed	Winery (Low strength)	1,038
11/08/2007 Thu	Gray Water 0-75K TDS	2,881
11/08/2007 Thu	Gray Water 75K-200K TDS	796
11/08/2007 Thu	Septage	3,128
11/08/2007 Thu	Winery (Low strength)	274
11/09/2007 Fri	Gray Water 0-75K TDS	3,265
11/09/2007 Fri	Gray Water 75K-200K TDS	648
11/09/2007 Fri	Process Water	1,210
11/09/2007 Fri	Septage	3,689
11/09/2007 Fri	Winery (Low strength)	516
11/10/2007 Sat	Gray Water 0-75K TDS	2,817

Done

# Process Controls

Digester Loading Calculation - Microsoft Internet Explorer

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Address [http://wastewater/R2/cgi-bin/R2Only/dig\\_loadcalc.cfm](http://wastewater/R2/cgi-bin/R2Only/dig_loadcalc.cfm) Go Links

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## Digester Loading Calculation

July 3, 2006

**Logged In User:** Heidi M Benenson **Role:** ADMIN

### Digester Loading Calculation

Step	Description	Data	Result
1.	No. of digesters:	<input type="text" value="6"/>	<input type="text" value="211151"/> Kg/day (maximum plant load)
2.	Raw sludge flow:	<input type="text" value="216000"/> GPD	<input type="text" value="77796"/> Kg/day (1 <sup>o</sup> sludge load)
3.	Secondary sludge flow:	<input type="text" value="1850000"/> GPD	<input type="text" value="69336"/> Kg/day (2 <sup>o</sup> sludge load)
New calculated Allowed Loading		<input type="text" value="64019"/>	Kg/day (R2 allowed)
1 - 2 - 3 =			

Change Allowed Loading

#### Current

<u>Reserved Today</u>	18,494 Kg/day
Allowed	<b>64,019 Kg/day</b>
Sent to Digester yesterday	10,031 Kg/day

Local intranet

# Truck Track Reports

**R2 Restricted Activities Home Page - Microsoft Internet Explorer**

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Address <http://wastewater/R2/cgi-bin/R2Only/reports.cfm> Go Links

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**R2 Restricted Activities Home Page** November 7, 2007 3:28 PM

**Logged In User:** Heidi M Benenson **Role:** ADMIN

**Select a Function:**

<p><b>I. Queries</b></p> <ul style="list-style-type: none"> <li>■ <a href="#">Broker/Hauler List for Customers</a></li> <li>■ <a href="#">Companies/Permit</a></li> <li>■ <a href="#">Company/Permit/Insurance Dates</a></li> <li>■ <a href="#">Permits Hauled by Specific Haulers</a></li> <li>■ <a href="#">Process Group Query</a></li> <li>■ <a href="#">Transactions</a></li> </ul> <p><b>II. Financial Reports</b></p> <ul style="list-style-type: none"> <li>■ <a href="#">Account Disposal Summary</a></li> <li>■ <a href="#">Client Revenue Summary</a></li> <li>■ <a href="#">Rate Justification</a></li> <li>■ <a href="#">Waste Trends</a></li> <li>■ <a href="#">Permit Renewals</a></li> </ul> <p><b>III. Accounting Department Reports</b></p> <ul style="list-style-type: none"> <li>■ <a href="#">Monthly Billing Summary</a></li> <li>■ <a href="#">Permit Billing Detail Report</a></li> </ul> <p><b>IV. Ticket Reconciliation Tools</b></p> <ul style="list-style-type: none"> <li>■ <a href="#">Cancelled Loads Report</a></li> <li>■ <a href="#">Potential Duplicate Loads Report</a></li> <li>■ <a href="#">Update Transactions billed by weight</a></li> <li>■ <a href="#">Update Transactions by charge</a></li> </ul>	<p><b>V. TruckTrack Maintenance</b></p> <ul style="list-style-type: none"> <li>■ <a href="#">Disposal Location Different Than Default</a></li> <li>■ <a href="#">Disposal Price Different Than Default</a></li> <li>■ <a href="#">Maintain Digester COD Loading</a></li> </ul> <p><b>VI. Truck Deliveries</b></p> <ul style="list-style-type: none"> <li>■ <a href="#">Generate IP</a></li> <li>■ <a href="#">Monthly Disposal Location Summary</a></li> <li>■ <a href="#">Waste Category Disposal Summary</a></li> <li>■ <a href="#">Waste Category Disposal Summary - by Day</a></li> <li>■ <a href="#">Waste Type Disposal Summary</a></li> <li>■ <a href="#">RSI balance</a></li> <li>■ <a href="#">Truck Count Averages</a></li> <li>■ <a href="#">Haulers Sorted by Permits Delivered</a></li> <li>■ <a href="#">Disposal Site Loading</a></li> </ul> <p><b>VI. Lab Links</b></p> <ul style="list-style-type: none"> <li>■ <a href="#">LIMS R2 data</a></li> <li>■ <a href="#">LIMS R2 Summary</a></li> </ul>
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**Link To:** [Employee Directory](#) | [Timesheet](#) | [District](#) | [Wastewater](#) | [Lab](#) | [ESD](#) | [R2](#) | [T2](#)

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Local intranet

# What's In That Truck?

## Audit Program Tracking

**Audits Conducted - Microsoft Internet Explorer**

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Back Forward Stop Home Search Favorites Media Print Copy Paste Address [http://wastewater/r2/cgi-bin/R2Only/inspections/disp\\_inspections.cfm](http://wastewater/r2/cgi-bin/R2Only/inspections/disp_inspections.cfm) Go Links

Links: Home Reports Authorize Disposal Transactions R2 Activities Reference Tables R2 Insp. Aging Rpts Log Off Help

**Audits Conducted** October 4, 2007 9:09 AM

Logged In User: Heidi M Benenson Role: ADMIN

Start Date: 09/01/2007 Through: 10/01/2007 Excel? ☐ GO [Add new Inspection](#)

**Between 09/01/2007 through 10/01/2007**  
**2652 Total Trucks Received and 256 ( 10%) Total Audited**

1154 Trucks Received during Day Shift (M-F 7AM to 5PM)			
Total Audited	Inspections	Field Analysis	Lab Analysis
201 (17%)	78 (39%)	69 (34%)	54 (27%)

1498 Trucks Received during Off Shift (5PM to 7AM weekdays and 24 hrs weekends and holidays)			
Total Audited	Inspections	Field Analysis	Lab Analysis
55 ( 4%)	13 (24%)	36 (65%)	6 (11%)

Receipt (edit)	Time	Permit	pH	Sample	Disposal Site	Waste Cat	Inspector	Type	Comments
110418	27-Sep-07 02:22 PM	Septage	8.0	L138572-5	Septage Station A	Septage	DLM	L	
110417	27-Sep-07 02:15 PM	Domestic (Septage)	8.0	L138572-4	Septage Station A	Septage	DLM	L	
110412	27-Sep-07 01:45 PM	Napa Bottling Center	4.0	L138573-2	R2 High Strength Station	Winery (Low strength)	DLM		
110397	27-Sep-07 11:32 AM	Domestic (Septage)	8.0	L138572-3	Septage Station A	Septage	DLM		
110394	27-Sep-07 11:19 AM	Septage	9.0	L138572-2	Septage Station A	Septage	DLM		
110392	27-Sep-07 11:07 AM	Domestic (Septage)	7.0	L138572-1	Septage Station A	Septage	DLM		
110382	27-Sep-07 09:29 AM	Rinse Water		L138550-1	Septage Station A	Gray Water 0-75K TDS	RCS		
110306	26-Sep-07 12:32 PM	Domestic (Septage)	7.0		Septage Station A	Septage	DLM		
110304	26-Sep-07 12:22 PM	Lees Waste	7.0	L138573-1	R2 High Strength Station	Winery (Low strength)	DLM		
110303	26-Sep-07 12:18 PM	Septage	8.0		Septage Station A	Septage	DLM	F	
110295	26-Sep-07 11:51 AM	Napa Bottling Center	6.0		R2 High Strength Station	Winery (Low strength)	DLM	F	
110289	26-Sep-07 11:05 AM	Acid Rinse + Salt Whey	4.0		R2 High Strength Station	Liquid Organic Wastes	DLM	F	
110282	26-Sep-07 10:52 AM	Excess Process Water	6.0		R2 High Strength Station	Gray Water 75-200k HighStrength	DLM	F	
110281	26-Sep-07 10:30 AM	Fats Oil and Grease	4.0		Recovery Tanks (RSI)	FOG	DLM	F	
110279	26-Sep-07 10:24 AM	FOG	5.0	L138574-1	Recovery Tanks (RSI)	FOG	DLM	L	

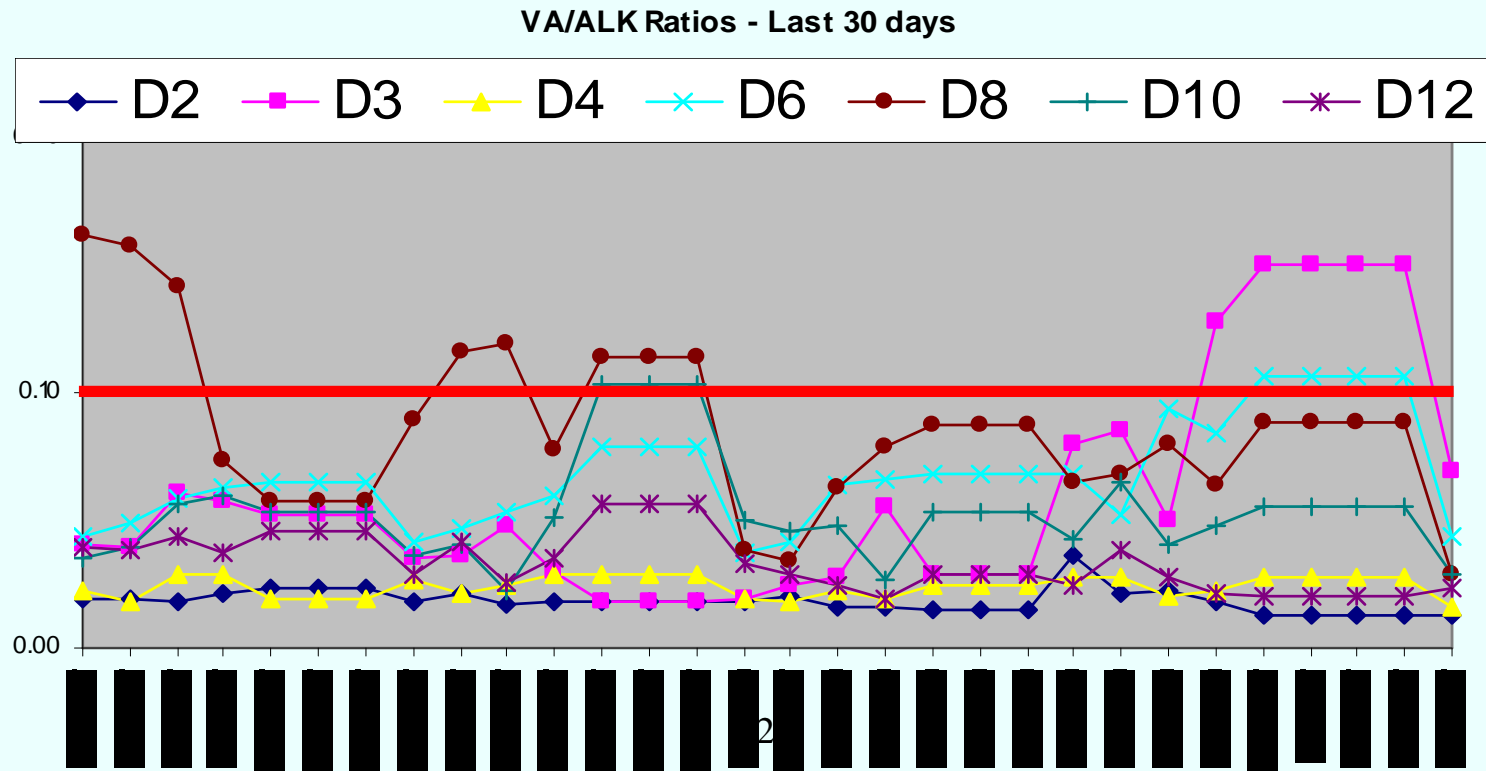
Done Local intranet



**Automated  
LIMS Outliers**

# Process Tracking

- Operational considerations for waste acceptance and control
  - VA:Alkalinity
  - MOP 8 design limit

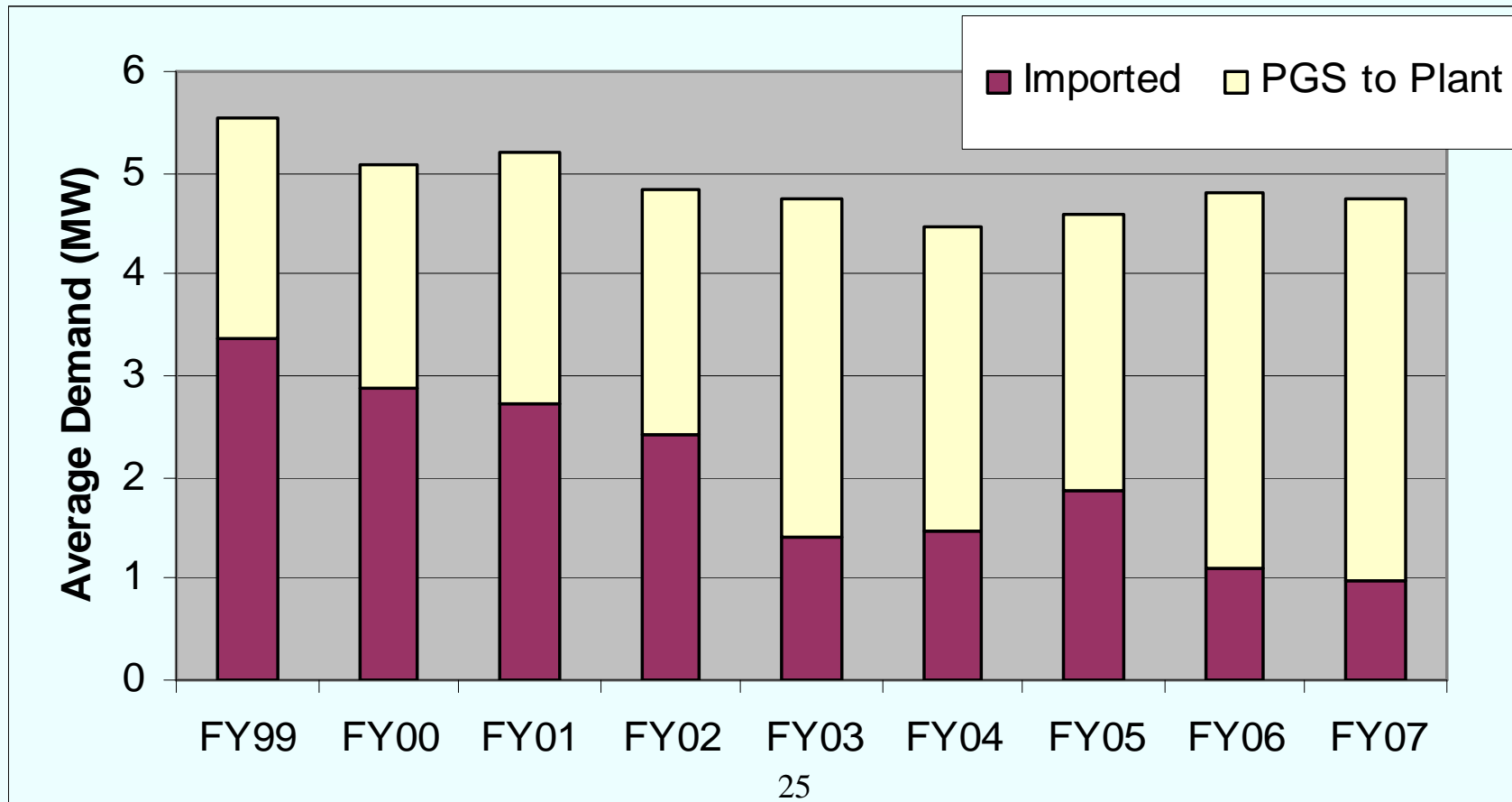


# Environmental Benefits

- 💧 Sound local disposal for trucked waste
- 💧 Key to regional Fat Oil Grease (FOG) control
- 💧 High salinity waste option
- 💧 Diverts waste from landfills
- 💧 Creates renewable green power

# Waste to Energy

- On-site energy production powered nearly 90% of plant demand



# Program Challenges

- 💧 Odors
  - Odor mitigations constructed for FOG processing facility
  - Mitigations for odor control for trucked waste receiving stations



- 💧 Truck Traffic

- 💧 Operational Challenges



# Program Challenges



# The Future - Food Waste Initiative

- Commercial Food Waste

- Bay Area generates approximately 1,700 tons/day
- Sustainable, local, high methane value feed stock
- Working to expand pilot with long-term (20+ year) contract



- Significant interest from local communities in regards to landfill diversion and renewable energy
- Potential for green house gas emission credits via destruction of methane gas (as compared to alternative)

# FOG to Biodiesel

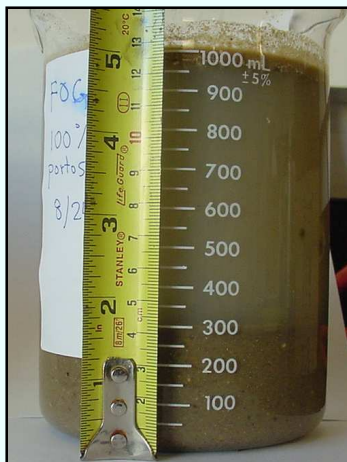
- Processing FOG to brown grease is initial step in biodiesel production
- District began a pilot in 2006; running four District fleet trucks on B-100 & B-20
- Labor intensive and messy
- Odors, odors and odors



Brown Grease Processing Facility

# Biodiesel Pilot Facility

- 💧 A number of methodologies convert oils to biodiesel
- 💧 Base catalyzed transesterification with methanol, most common
- 💧 Glycerin and waste methanol are byproducts
- 💧 Production challenges include: Variable quality feedstock, Contaminant (water and solids) level, High free fatty acid content



Raw  
FOG



Brown  
Grease  
2-5% of  
FOG



# Biodiesel – Next Steps

- Prepare cost analysis:
  - Full scale life cycle cost analysis
  - Energy balance as compared to anaerobic digestion of FOG
  - Quantify other value-added benefits
- Assess alternative of contributing brown grease to large private biodiesel facility (using virgin oil)

# Summary

- 💧 Providing a sound, environmentally responsible discharge option for trucked waste is the right decision for the watershed
- 💧 Putting our ratepayers investments to use for financial and environmental benefit
- 💧 Tracking and monitoring hauled wastes is complex but it's possible to make it worth the risk