







Clean Harbors Env. Services, Inc. Rumery Road Facility, South Portland, ME Central Waste Treatment Facility

October 27, 2016







Complementary Networks

Clean Harbors



- **Waste Management Facilities**
- ▲ Solvent Recycling or Oil Recevery
- ▲ Treatment, Storage & Disposal Facility
- Transformer Processing Facility
- **Wastewater Treatment**
- Inclneration
- **Environmental Service Locations**
- **Energy & Industrial Services Locations**
- Lodging Services Locations

Safety-Kleen



- **Branch Service Centers**
- **Recycling Centers**
- Manufacturing/Reconditioning
- **Distribution Centers**
- **Accumulation Centers**
- Oil Collection/Processing
- Oil Refineries
- Established EFS Hubs



Central Waste Treatment Facilities Subcategories



- A. Metals Bearing Waste
- B. Used/Waste Oil Bearing Waste
- C. Organics Bearing Waste
- D. Mixed Waste Multiple Wastestreams



Oils Subcategory Determination

- Used Oil; Oil-Water Emulsions; Oil Spill Cleanup
- Lubricants; Coolants; Machine Cutting Oils
- Petrol Contaminated Groundwater; Bilge Water
- Separator Waste; Oily Parts Cleaning

Analysis: Total O&G > 100 mg/l



Metals Subcategory Determination

- Electroplating Baths; Metal Finishing Rinsewater
- Air Pollution Blowdown; Incineration Wastewater
- Waste Acids & Bases; Acidic/Basic Parts Wash
- Vibratory Deburring Wastewater

• Analysis:

- If Total O&G < 100 mg/l
- Cd > 0.2 mg/l; Cr > 8.9 mg/l; Cu > 4.9 mg/l
- Ni > 37.5 mg/l



Organics Subcategory Determination

- Landfill Leachate; Non-Petrol Cont. Groundwater
- Paint Wash water; Solvent Bearing Wastewater
- Adhesive/epoxy wastewater
- Chemical Production wastewater

• Analysis:

Total O&G < 100 mg/l

Metals Concentration < Metal SubCat Waste



WASTE MATERIAL PROFILE SHEET

Clean Harbors Profile No. CH1247156B

A. GENERAL INFORMATION

GENERATOR EPA ID #/REGISTRATION #

GENERATOR CODE (Assigned by Clean Harbors)

ADDRESS TOO EM SINCE

CUSTOMER CODE (Assigned by Clean Harbors)

ADDRESS CONTROL STREET



NHD999999998

GENERATOR NAME:

CITY Manchester

CUSTOMER NAME:

CITY Manchester



STATE/PROVINCE

ZIP/POSTAL CODE

03101

PHONE: (207) 947-7345

STATE/PROVINCE

NH

ZIP/POSTAL CODE

03101

B. WASTE DESCRIPTION

WASTE DESCRIPTION:

Oil and Water with sediment

PROCESS GENERATING WASTE:

Elevator Shaft Cleanout

ODOR

•

IS THIS WASTE CONTAINED IN SMALL PACKAGING CONTAINED WITHIN A LARGER SHIPPING CONTAINER ?

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL	STATE
SOLID	WITHOU

SOLID WITHOUT FREE LIQUID

POWDER

MONOLITHIC SOLID

LIQUID WITH NO SOLIDS LIQUID/SOLID MIXTURE

% FREE LIQUID

10.00 - 50.00 % SETTLED SOLID 30.00 - 70.00

% TOTAL SUSPENDED SOLID 10.00 - 30.00

SLUDGE

GAS/AEROSOL

NUMBER OF PHAS	SES/LAYERS
----------------	------------

¥ 2 % BY VOLUME (Approx.)

NONE

MILD

STRONG

TOP MIDDLE

70.00 0.00

BOTTOM

30.00

BOILING POINT OF (OC)

<= 95 (<=35)

>= 130 (>54)

95 - 100 (35-38)

101 - 129 (38-54)

✓ 1 - 100 (e.g. Water)

VISCOSITY (If liquid present)

101 - 500 (e.g. Motor Oil)

501 - 10,000 (e.g. Molasses)

> 10.000

MELTING POINT °F (°C)

< 140 (<60)

140-200 (60-93)

٧ > 200 (>93)

TOTAL ORGANIC CARBON

<= 1%

1-9%

COLOR

varies

>= 10%

FLASH POINT °F (°C) < 73 (<23)

73 - 100 (23-38)

101 -140 (38-60)

141 -200 (60-93)

y > 200 (>93)

7 (Neutral) 7.1 - 12.4>= 12.5

<= 2

2.1 - 6.9

pH

SPECIFIC GRAVITY

Describe:

< 0.8 (e.g. Gasoline)

0.8-1.0 (e.g. Ethanol)

1.0 (e.g. Water)

1.0-1.2 (e.g. Antifreeze) > 1.2 (e.g. Methylene Chloride) ASH

< 0.1 0.1 - 1.0

v

> 20

Unknown

1.1 - 5.05.1 - 20.0

BTU/LB (MJ/kg)

< 2,000 (<4.6)

2,000-5,000 (4.6-11.6)

5,000-10,000 (11.6-23.2)

> 10,000 (>23.2)

Actual:

D. COMPOSITION (List the complete composition of the waste, include any inert components and/or debris. Ranges for individual components are acceptable. If a trade name is used, ease supply an MSDS Please do not use abbreviations)

CHEMICAL

HYDRAULIC OIL

SEDIMENT

MIN 10.0000000

40.0000000

MAX UOM %

- 30.0000000

- 80.0000000



Clean Harbors Profile No. CH1247156B

E. CONSTITUENTS

Are these values based on testing or knowledge?	V	Knowledge	Testino
---	---	-----------	---------

If based on knowledge, please describe in detail, the rationale applied to identify and characterize the waste material. Please include reference to Material Safety Data Sheets (MSDS) when applicable. Include the chemical or trade-name represented by the MSDS, and or detailed process or operating procedures which generate the waste.

customer chemical and process knowledge and review of material labels

Please indicate which constituents below apply. Concentrations must be entered when applicable to assist in accurate review and expedited approval of your waste profile. Please note that the total regulated metals and other constituents sections require answers.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL	UOM	NOT APPLIC	CABLE	
D004	ARSENIC	5.0	19			v		
D005	BARIUM	100.0				✓		
D006	CADMIUM	1.0				~·····		
D007	CHROMIUM	5.0				~		
D008	LEAD	5.0				<u>~</u>		
D009	MERCURY	0.2				V		
D010	SELENIUM	1.0				V		
D011	SILVER	5.0				V		
D040	VOLATILE COMPOUNDS	0.5		OTHER CONSTITUENTS		MAX	иом	NOT APPLICABLE
D018	BENZENE	0.5		- BROMINE				
D019	CARBON TETRACHLORIDE	0.5						V
D021	CHLOROBENZENE	100.0		CHLORINE				<u>~</u>
D022	CHLOROFORM	6.0		FLUORINE				~
D028	1,2-DICHLOROETHANE	0.5		IODINE				V
D029	1,1-DICHLOROETHYLENE	0.7		SULFUR			2000000	V
D035	METHYL ETHYL KETONE	200.0		POTASSIUM				V
D039	TETRACHLOROETHYLENE	0.7		SODIUM				V
D040	TRICHLOROETHYLENE	0.5		AMMONIA				V
D043	VINYL CHLORIDE	0.2		CYANIDE AMENABLE				V
	SEMI-VOLATILE COMPOUNDS	 }		CYANIDE REACTIVE				Ū
D023	o-CRESOL	200.0		CYANIDE TOTAL				V
D024	m-CRESOL	200.0		SULFIDE REACTIVE				V
D025	p-CRESOL	200.0		HOCs		PCBs		
D026	CRESOL (TOTAL)	200.0		- NONE		✓ NONE	E	



F. REGULA	TORY	STAT	US					
YES	•	NO	USEPA HAZARDOUS	WASTE?				
YES	~	NO	DO ANY STATE WAS	TE CODE	S APPLY?			
			Texas Waste Code					
YES	*	NO	DO ANY CANADIAN	ROVINCI	AL WASTE CODES APPLY?			
YES	•	NO	IS THIS WASTE PRO	HIBITED F	ROM LAND DISPOSAL WITHOU	UT FURTHER TREATMENT P	ER 40 CFR PART 268?	
			LDR CATEGORY: VARIANCE INFO:	Not s	ubject to LDR			
YES	*	NO	IS THIS A UNIVERSA	L WASTE	?			
✓ YES		NŌ	IS THE GENERATOR	OF THE V	WASTE CLASSIFIED AS CONDI	TIONALLY EXEMPT SMALL Q	UANTITY GENERATOR	(CESQG)?
YES		NO	IS THIS MATERIAL G	OING TO	BE MANAGED AS A RCRA EXE	MPT COMMERCIAL PRODUC	T, WHICH IS FUEL (40 C	CFR 261.2 (C)(2)(II))?
YES	~	NO	DOES TREATMENT	OF THIS W	ASTE GENERATE A F006 OR I	F019 SLUDGE?		
YES		NO	IS THIS WASTE STR	EAM SUBJ	JECT TO THE INORGANIC MET	AL BEARING WASTE PROHIE	BITION FOUND AT 40 CF	R 268.3(C)?
YES	~	NO	DOES THIS WASTE	CONTAIN	VOC'S IN CONCENTRATIONS >	=500 PPM?		
YES	4	NO	DOES THE WASTE O	ONTAIN	GREATER THAN 20% OF ORGA	NIC CONSTITUENTS WITH A	VAPOR PRESSURE >-	.3KPA (.044 PSIA)?
YES	•	NO	DOES THIS WASTE	CONTAIN	AN ORGANIC CONSTITUENT V	HICH IN ITS PURE FORM HA	AS A VAPOR PRESSURE	> 77 KPA (11.2 PSIA)?
YES	~	NO	IS THIS CERCLA REG	SULATED	(SUPERFUND) WASTE?			
YES	•	NO	IS THE WASTE SUBJ	ECT TO C	NE OF THE FOLLOWING NESH	HAP RULES?		
			Hazardous Orga	nic NESH/	AP (HON) rule (subpart G)	Pharmaceuticals prod	fuction (subpart GGG)	
YES		NO	IF THIS IS A US EPA	HAZARDO	OUS WASTE, DOES THIS WAST	E STREAM CONTAIN BENZE	NE?	
	YES		NO Does the wa NESHAP rul	ste stream	come from a facility with one of the the original source of the waste	he SIC codes listed under benz is from a chemical manufactur	zene NESHAP or is this wing, coke by-product reco	vaste regulated under the benzene very, or petroleum refinery process
	YES	3	NO Is the genera	iting sourc	e of this waste stream a facility w	ith Total Annual Benzene (TAB	3) >10 Mg/year?	
	Wha	at is the	e TAB quantity for your	acility?	Mega	gram/year (1 Mg = 2,200 lbs)		
	The	basis	for this determination is	Knowledg	ge of the Waste Or Test Data		Knowledge	Testing
	Des	cribe t	he knowledge :					

H. TRANSPORTATION REQUIREMENTS

NON DOT REGULATED MATERIAL, (OIL, WATER)

DOT/TDG PROPER SHIPPING NAME:

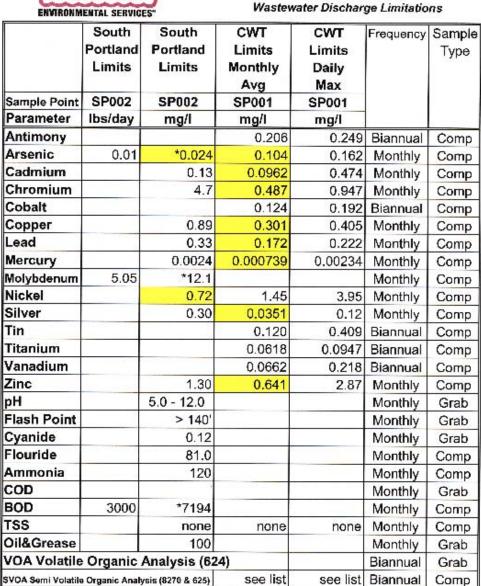
Pretreatment Standards – CWT Limits Technology Basis



- Metals Treatment
 - Primary Precipitation; Solids Separation; 2nd Precipitation;
 - Clarification & Sand Filtration
- Oils Treatment
 - Emulsion Breaking; Gravity Separation & DAF
- Organics Treatment
 - Equalization & Biological Treatment.



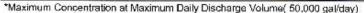
Rumery Road Facility



500

178 Biannual

Grab



^{*}Mass Limit - pounds per day

Cyanide - Sample Point SP003





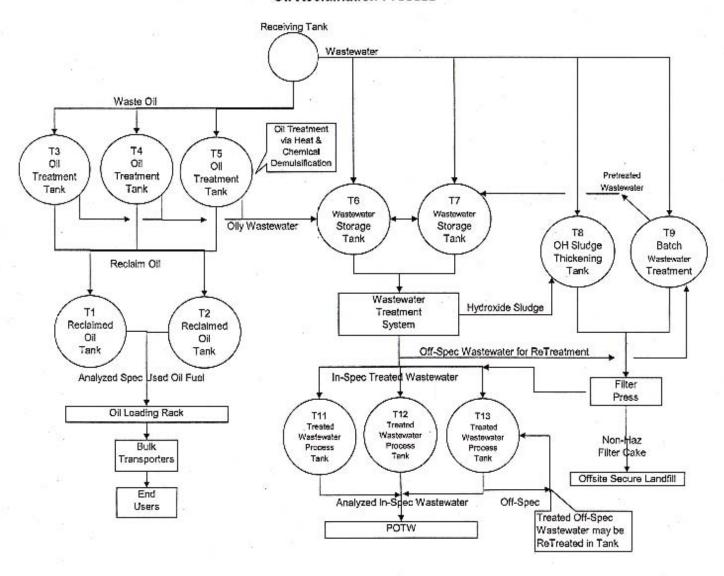
CWT Organic Limits



Rumery Road Facility Wastewater Discharge Limitations

Sample Point 001	CWT Mix	CWT Mixed Waste Limits					
		Daily Max	Monthly Avg				
		mg/l	mg/l				
Bis[2-ethylhexyl]phthalate		0.267	0.158				
Carbazole		0.392	0.233				
o-Cresol	2-Methylphenol	1.92	0.561				
p-Cresol	4-Methylphenol / 2	0.698	0.205				
n-Decane *	CAS 124-18-5	5.79	3.31				
Fluoranthene		0.787	0.393				
n-Octadecane *	CAS 593-45-3	1.22	0.925				
2,4,6-Trichlorophenol		0.155	0.106				

Oil Reclamation Process





Clean Harbors Env. Services, Inc., Rumery Road Facility, Prequalification Analysis

Generator		Dale.
Location		RU Prequat ID
Profile		CHESI Contact:
Profile Sample Description	•	Analyst:

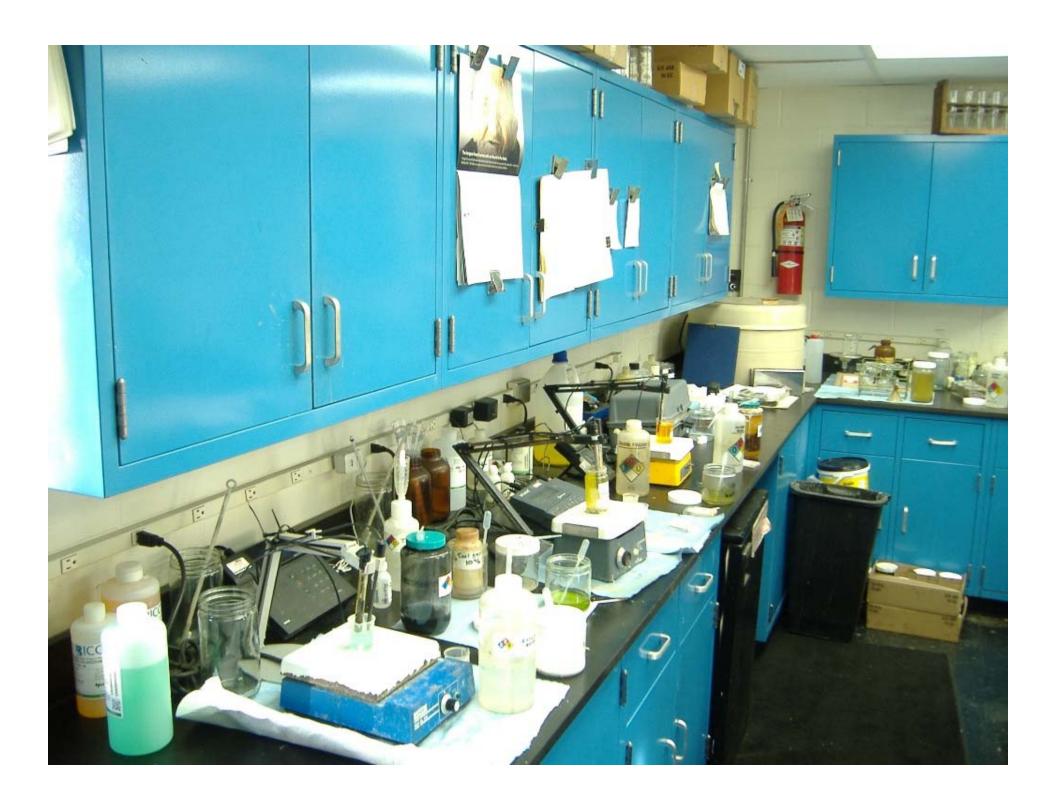


	Units	Description	l				
%Oil	%		Treatal	oility			
%Water	%		Chelato				
%Sediment	%		Treated	d Sotids	9	k Settled	
% Rag	%				% (Sentrifuge	ed
Total Hatogens	ppm				Comment	ts	
PCB's	ррт						
Flash Point	Dog F						
рН	s,u						•
Cyanide Screen	 Pos/Neg						
Sulfide Screen	 Pos/Neg						
Амто <u>пта Screen</u>	 ррт						
Fluoride Screen	ррт						
Acid Reaction	Pos/Neg						
Base Reaction	Pos/Neg						
COD	ppm						
Sample Phase	:		Units				
Metals Prep			L		T	reatab lity	
Antimony			mg/l		Jar Number	Volume	рН
Arsenic			mg/l			150mil	
Cadmium			mg/l		Spike Solution	5 mls	
Chromium			mg/l		Sulfurio	drapы	
Соран			i mg/l		PAC (1lb.gal)	5 mls	
Copper			: mg/l		Gen Ceag 10%	2 mls	
Lead			, mg/l		Lime (1fb/gal)	mls	
Mercury			; mg/l		Polymer	2 mls	
Mo-ybdenum			. mg/l				
Nickel			: mg/l		Supernate Color		
Silver			; mg/l		Supernate Clarit		
Tin) mg/l		Sludge Filterabil	ity	
Litanium	 	<u>-</u> .	mg/l				
<u>Vanadium</u>			i mg/l		Note	s:	
Zino			mg/l		For CHES!	Luse anly.	
Iran			mg/l	Analys	is for iniomal facilit	ty accepta	nce screening.
Barlum			mg/l		ND = Not	Detected	
Sekmium			mg/l	1	∜A = Not Applicat	ole or Not A	Analyzed



























Drum Number	Scanned	FC & Pump

Clean Harbors Environmental Services, Inc.

Fleet #____ Front Middle Back 37 Rumery Road South Portland, ME 04106 (207) 772-2201 MED980672182



Profile #		CH Sales Order#				Date
	Generator EFA ID					ategory s Organics
					Final	Code B26 CNOS
			Driver			Sampler
ervices, Inc.	MAD03932	2250				
			-			
	ervices, Inc.	Generator EFA ID	Generator EPA (D. Number Waste Codes	Generator EFA ID Number Waste Codes A	Generator EFA ID Number CV Waste Codes Metals A31 A Driver	Generator EFA1D Number CWT Co Waste Codes Metals Oils Final A31 A32 Driver

Sample Phase Breakdown

Estimated Truck Heal

Sample	Oil%	Water%	Sediment%	Rag%
Centrifuge		1		
BS&W				

Sampling	Offloading	Post Rinse
Inches	gals	gate

Offloading Activity

Total Gallons	Oil	Tank#	Aqueous	Tank#	Solids	Activity		Operator	
						Steam	Offload	Rinse	

Sample Analysis

Analysis Parameter	Oil Phase		Aqueous Phase		Units	Method	Analyst
Analysis Farameter	Result	Acceptance Limit	Result	Acceptance Limit		Memou	Analyst
Total Halogens	1	< 1000			ppm	EPA SW-846-9077	
Flash Point		>100°		>140°	ok	ASTM D-3278	
PCB's		< 2.0		< 0.003	ppm	EPA FCB Report 600/4 81 043	
Cyanide Screen				**	Pos / Neg	Cyantesmo Paper	
Ammonia Screen				tr	Pos/Neg/ppm	Test Paper or Quantofix	
pH Screen				2.0 - 12.5	Std Units	pH Paper/EPA 150.1	
Sulfide Screen				++	Pos / Neg	Lead Acetate Paper	
Total Sulfides				500	ppm	Hach Method 8131	
H2S Gas				100	ppm	CHEST SOP-61RU-601	
Metals Analysis	Yes / No	See Attached				EPA 200.7	

Notes: This lood is recommended for acceptance. Initials
Offloading, Treatment, H&S Issues:

**Acceptance based upon Treatability and Health & Salety.

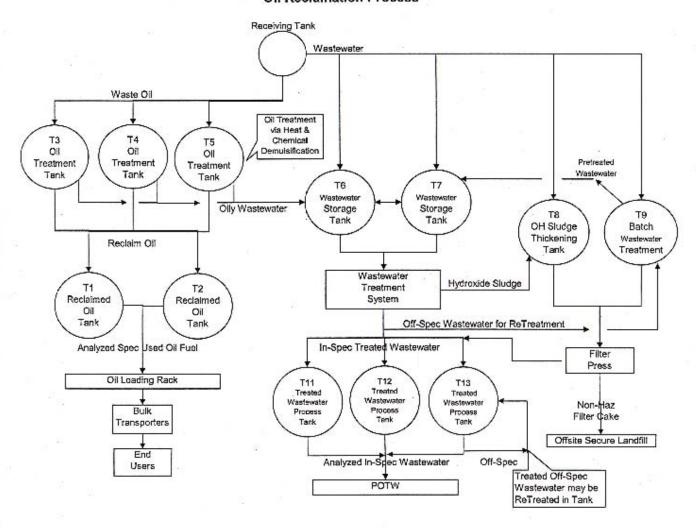
GM Init **Billing Comments** Minimum Charge: Tank Wash: XXX Steam: Heal Charge: Gals X S XXX /gal = X S Base Disposal Price: Gals / gal = Suspended Solids Surcharge: Gals /gal =

Analysis results are for Clean Harbors Env. Services, Inc. internal use only.





Oil Reclamation Process

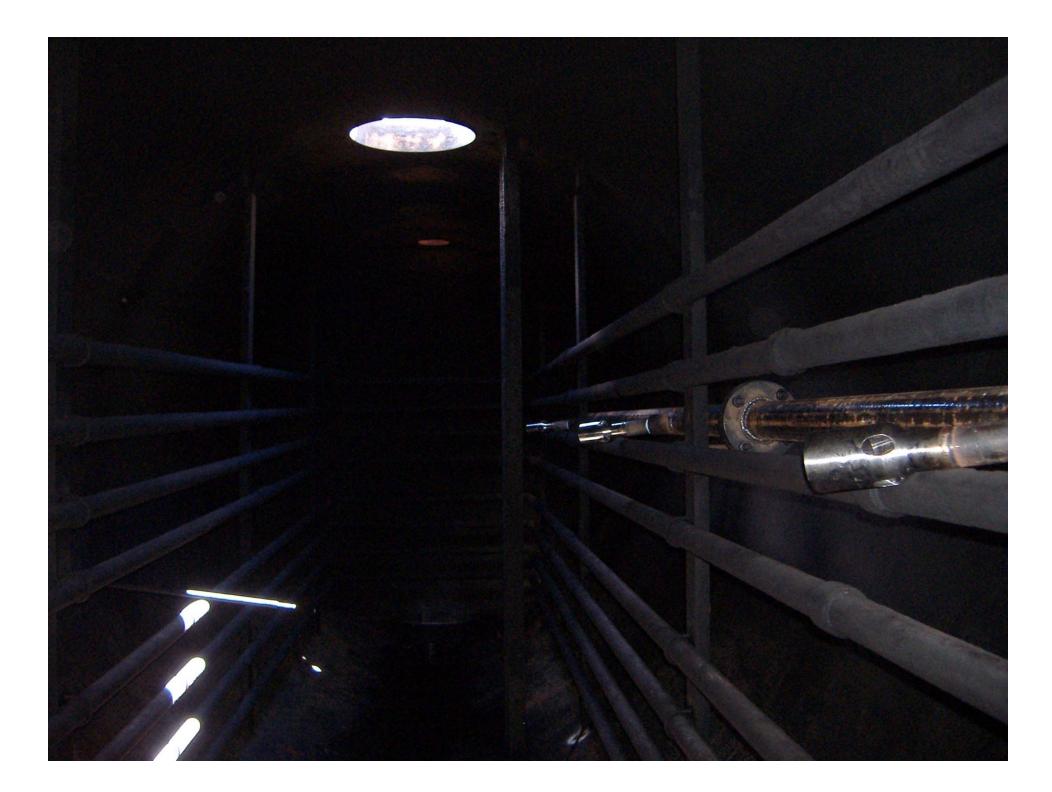






















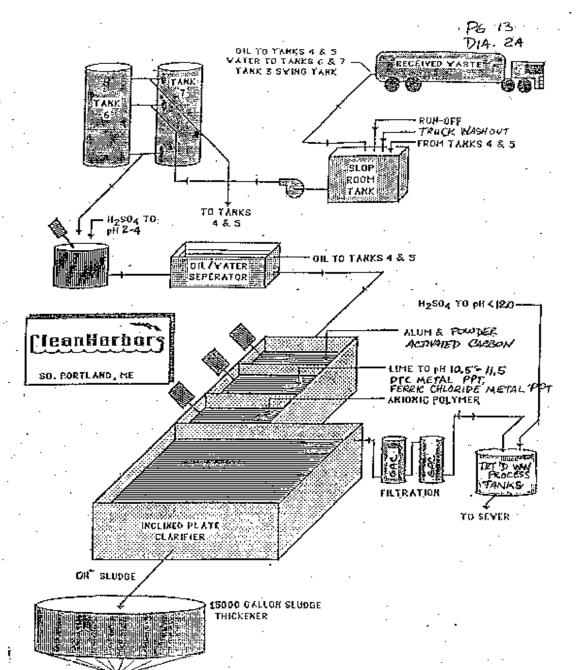




Central Waste Treatment Facilities Subcategories



- A. Metals Bearing Waste
- B. Used/Waste Oil Bearing Waste
- C. Organics Bearing Waste
- D. Mixed Waste





November 2, 2016 - Clean Ha

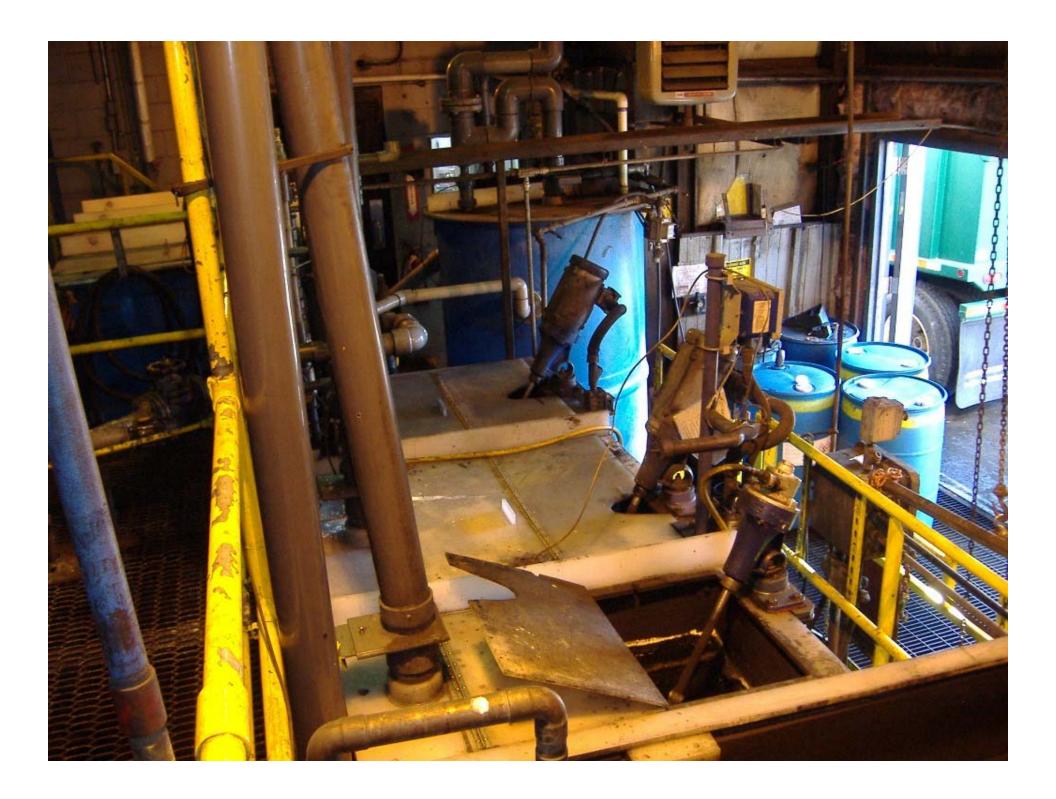
THICKERED SLUDGE TO FILTER PRESS





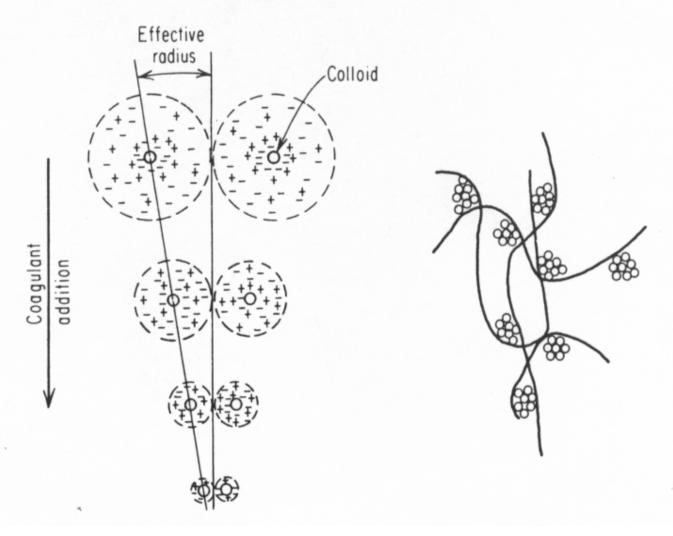








THE NALCO WATER HANDBOOK



Coagulation

Flocculation

Coagulation & Flocculation:



Coagulation:

The charge neutralization of colloidal matter. To destabilize the charge, usually negative, surrounding the colloid.

The stronger the repulsive forces the more stable the colloidal suspension, and the longer the particle will take to settle by gravity.

Colloid or Colloidal Particle: Matter of very fine particle size. Colloids are suspensions, which give water a turbid or hazy appearance.

Flocculation:

The process of agglomerating coagulated particles into a settleable floc. "Floc Building Stage."

Coagulants:

CleanHarbors

-Iron Salts
Ferric Choride FeCL₃
Ferric Sulfate Fe₂(SO₄)₂
Ferrous Sulfate FeSO₄

-Aluminum Salts
Aluminum Sulfate (Alum) Al₂(SO₄)₃
Aluminum Chloride AlCl₃

-Poly-Aluminum Chlorides PAC

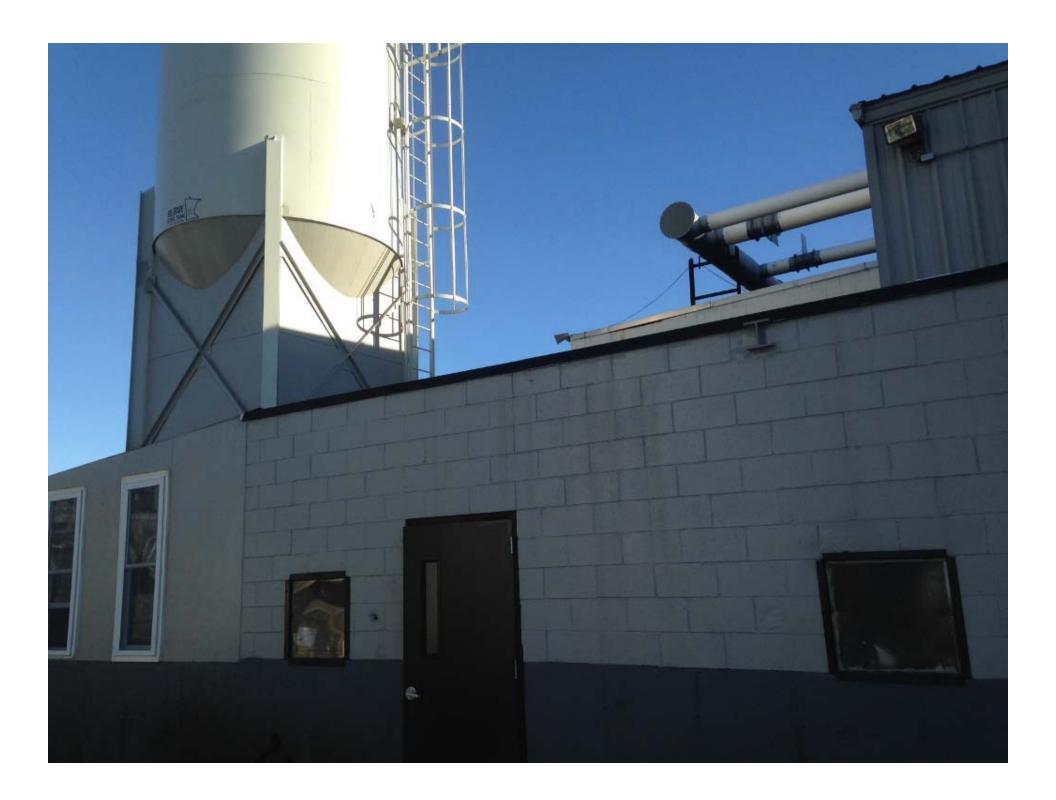
-Lime Ca(OH)₂

-Polyelectrolytes
Charged Polymers





















Metals Removal – Chemical Treatment

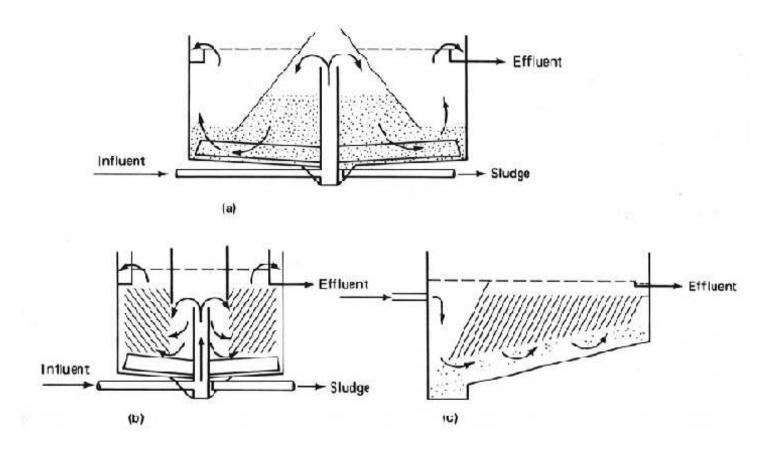
- Hydroxide Precipitation
 - Metal Hydroxide Floc = Insoluble
 - Lime: Calcium Hydroxide
 - Sodium Hydroxide
- Sulfide Precipitation
 - Metal Sulfide Precipitate. Less Solubility than OH
- Carbamate Precipitation
 - DiThioCarbamate DTC
 - Chelate Breaker & Chelator!
 - May strip metals out of Filter Press or Carbon Contactors
- Iron Co-Precipitation
 - Ferric Chloride & Ferrous Sulfate
 - Molybdenum, Vanadium, Antimony







Incline Plates







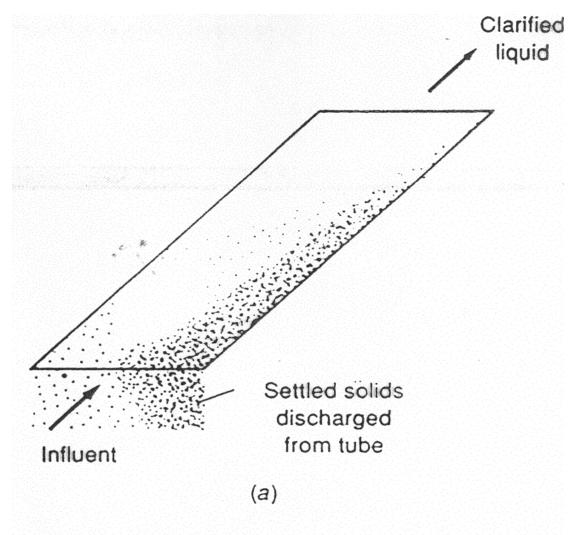




FIGURE 6-13
Typical inclined tube settler: (a) operation

From: WASTEWATER ENGINEERING, TREATMENT, DISPOSAL, AND REUSE, Third Edition, Metcalf and Eddy, Inc., 1979, McGraw-Hill Publishers













CHESI Rumery Road Facility

Wastewater Discharge Analysis Log

CHESI Rumery Road Facility					Wastewater Discharge Analysis Log							
	South	South	CWT	CWT	Date							
	PortId	PortId	Limits	Limits	Time							
	Limits	Limits	Monthly	Daily	Sample							
			Avg	Max	Analyst							Г
Parameter	lbs/day	mg/l	mg/l	mg/l	Prep							
Antimony			0.206	0.249	******							SI
Arsenic	0.01	*0.024	0.104	0.162	*****							A
Cadmium		0.13	0.0962		********							C
Chromium		4.7	0.487	0.947	*****							C
Cobalt			0.124	0.192	ASSANSASSA							C
Copper		0.89	0.301	0.405	*****							C
Lead		0.33	0.172	0.222	******							PI
Mercury		0.0024	0.000739	0.00234	*****							Hç
Molybdenum	5.05	*12.1			*****							M
Nickel		0.72	1.45	3.95	******							Ni
Silver		0.30	0.0351	0.12	*****							A
Tin			0.120	0.409	*****							Sı
Titanium			0.0618	0.0947	*****							Ti
Vanadium			0.0662	0.218	*****							٧
Zinc		1.3	0.641	2.87								Zı
pН		5.0 - 12.0			*****							Т
Flash Point		> 140'			******							
Cyanide		0.12			*****							Т
Flouride		81.0			******							
Ammonia		120			*****							Т
Flouride Ammonia COD BOD - est. DTC Check Color Clarity					******				-			\top
BOD - est.	3000	7194			*****							Т
DTC Check	-				******							\top
Color					*****							\top
Clarity					****							T
Discharge T	hru Filte	ar Bag (Y	es/No)									Τ
Comments			,									Τ
Discharge In	itials											\top
Discharge D					*****							\top





 $UA \supset X \cup X \cup Y$





Daily Discharge Pounds Calculation Worksheet

Arsenic Max Daily Discharge = 0.01 lbs

	man wany wieving vivi no									
Tank	Conc. (ppm)	x	Volume (gals)	÷	1,000,000	x	Weight of Water Ibs/gal	=	Pounds per Tank	Total Pounds
		Х		+	1,000,000	Х	8.34	=		
		х		÷	1,000,000	Х	8.34	=		
		Х		÷	1,000,000	х	8.34	=		
		х		÷	1,000,000	Х	8.34	=		
		X		÷	1,000,000	Х	8.34	=		
		х		÷	1,000,000	Х	8.34	=		

Molybdenum Max Daily Discharge = 5.05 lbs

Tank	Cone. (ppm)	x	Volume (gals)	÷	1,000,000	x	Weight of Water Ibs/gal	=	Pounds per Tank	Total Pounds
		Х		÷	1,000,000	Х	8.34	=		
		Х		÷	1,000,000	Х	8.34	=		
		х		÷	1,000,000	Х	8.34	=		
		Х		÷	1,000,000	х	8.34	=		
		X		÷	1,000,000	Х	8.34	=		
		х		÷	1,000,000	Х	8.34	=		

BOD Max DailyDischarge = 3000 lbs

Tank	Conc. (ppm)	x	Volume (gals)	÷	1,000,000	x	Weight of Water ibs/gal	=	Pounds per Tank	Total Pounds
		Х		÷	1,000,000	Х	8.34	=		
		X		÷	1,000,000	х	8.34	=		
		X		÷	1,000,000	Х	8.34	=		
		Х		÷	1,000,000	х	8.34	=		
		Х		÷	1,000,000	X	8.34	=		
		Х		÷	1,000,000	Х	8.34	•		

Pounds = (Concentration) X (Volume MG) X (Water Density)

= (ppm) X (gallons) + (1,000,000) X (8.34 lbs/gal)

November 2, 2016 - Clean Ha





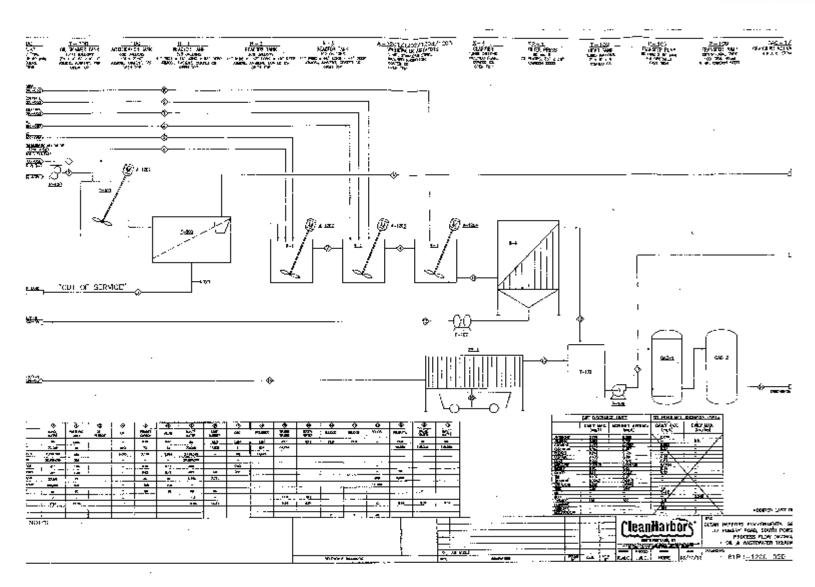














A Sample Text & Picture Placement Slide



Use this area for graphics, such as photo images.

Delete this box and text before placing your graphic images.













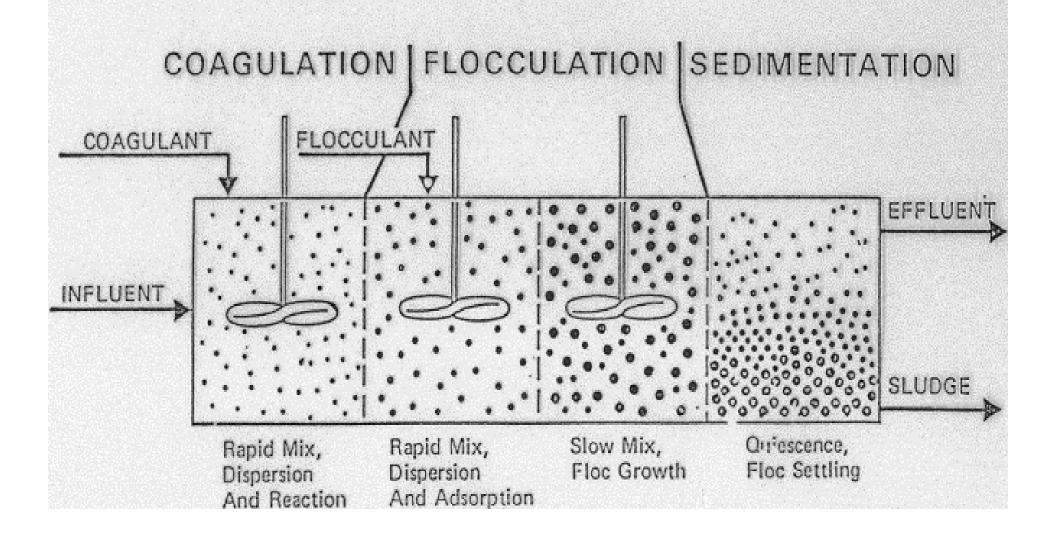






From: Industrial Wastewater Pretreatment Seminar, University of Toledo, given March30, 1995, at Somerville, MA

COAGULATION/FLOCCULATION PROCESS SEQUENCE



Settling Rates



Typical	mm	μm	Surface area (total)	Settling time, 1 m fall
Gravel	10.	10,000	3.14 cm ²	1 s
Coarse sand	1.	1,000	31.4 cm^2	10 s
Fine sand	0.1	100	314 cm ²	125 s
Silt	0.01	10	0.314 m ²	108 min
Bacteria	0.001	1.	3.14 m^2	180 hr
Colloidal matter	0.0001	0.1	31.4 m ²	755 days

NOTE: Particles larger than 100 μ m are visible to the naked eye and are considered to be settleable solids. In the range of 10–100 μ m, they are considered to be turbid. Below 10 μ m they are considered colloidal. Particles larger than 0.1 μ m are visible by light microscope; below 0.1 μ m, the electron microscope is used for detection.











