

**MAINTENANCE AND
OPERATIONS MANUAL FOR
FOR STORMWATER AND INDUSTRIAL
WASTEWATER TREATMENT SYSTEM
LOCATED AT
SAVANNAH
TERMINAL**

CSX INTERMODAL
3000 Tremont Avenue
Savannah, GA 31405



Prepared for:

CSX INTERMODAL
301 WEST BAY STREET
JACKSONVILLE, FL 32202

Prepared by:

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July, 2011

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1. Stormwater System

The stormwater collection system for the equipment service and maintenance consists of 60 ft x 60 ft curbed area. The surface drains to one (1) catch basin, located in a southwest corner on the curbed area. The curbs and rollover curb prevent runoff from surrounding areas. The catch basins drain via gravity piping to a concrete sump adjacent to the curbed drainage area. A 1,000 gallon diesel fuel tank is located on the south side, within the curbed area. The fuel tank is not equipment is not equipped with secondary containment and any spills from this tank would flow to the stormwater catch basin. Additionally a 275 gallon motor oil and a 275 gallon hydraulic fluid tanks are located in vicinity of the oil water separator. Both tanks are equipped with secondary containment. The items described above are shown on aerial photographs in **Attachment A**, system photographs shown in **Attachment B** and system drawings found in **Attachment C** of this document.

2. Industrial Wastewater/Stormwater System

The industrial wastewater stormwater system treats runoff from equipment service area described in Item 1.

The contributing areas were observed to be as follows:

Maintenance Pad	3,600 sq. ft	0.08 ac
Other contributing areas	0 sq. ft	0.00 ac
Total	3,600 sq. ft	0.08 ac

The size of the concrete sump described in Item 2. is approximately 6 ft x 8 ft x 4 ft (with 1 ft freeboard and 3 ft operating depth) resulting in available volume of 144 cubic feet (1,077 gal). Pump retention is approximately 107 minutes, based on maximum oil water separator flow of 10 g.p.m. The volume of the sump appears to have sufficient volume to contain a spill from the diesel fuel tank.

The concrete retention sump is completely covered with metal cover with access ports for service. Water in the concrete sump is pumped to the above referenced oil water separator via one (1) submersible sump, operated by a flow switch. The oil water influent line is equipped with 1 ½" flow meter. The oil water separator is model ESD OWS-15, manufactured by ESD Waste2Water, Inc of Ocala, Florida. Please see **Attachment D** for OWS details. Skimmed oil is discharged to 150 gallon used oil tank

adjacent to the oil water separator. Treated effluent flows to internal clean effluent sump. The effluent is then pumped (**Attachment G**) through a sediment prefilter (**Attachment E**) and then through two (2) Ecologix AHP-55 vessels (**Attachment F**) connected in series. The treated effluent flows to existing stormwater manhole located approximately 500 ft from the equipment.

3. Maintenance

General maintenance items are proposed below:

General:

Verify that contaminate waste is being disposed of properly.
Dispose of all debris, litter in proper receptacles.
Clean all pumps and tanks with clean water.
Pressure wash interior of OWS. Wipe dry pumps and tanks.

Influent Containment Area:

Remove all debris, litter and trash from sump.
Check water level in feet and inches.
Check sludge depth in inches
Check waste oil in sump. Measure depth to determine if it need to be pumped.
Check pump float

Oil water separator:

Check exterior and interior condition of the oil/water separator and effluent sump.
Check oil/water separator for algae build-up.
Set water level inside the oil water separator
Check OWS drain piping and water level. Clean tanks if necessary.
Check OWS water and oil level switches.
Operate effluent pump manually.
Check pref-filter, Ecologix vessels for damage/leakage. Observe that the maximum pressure in the system does not exceed 30 psi.

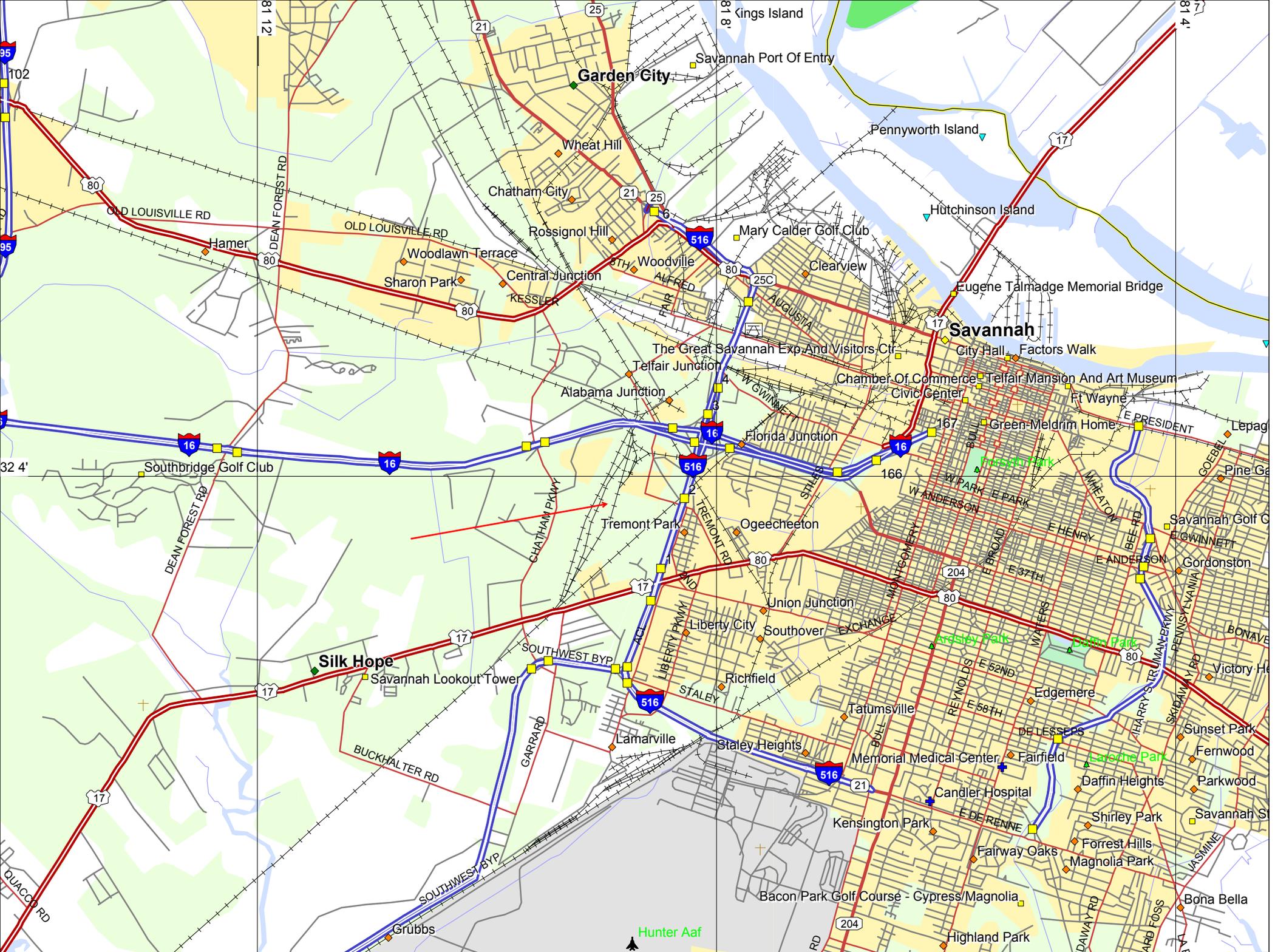
Maintenance pad area:

Verify contaminate waste is being disposed of properly.
Remove all debris, litter and dirt from maintenance pad, grate and inlet Pressure wash maintenance pad.
Check inlet for sludge/grit build-up. Remove and place in 55 gal drum as needed.

Detailed Equipment Maintenance Checklist can be found in Attachment I.

ATTACHMENT A

Site Location Map, Aerial Photograph



Garden City

Savannah

Silk Hope

Hunter Aaf

Savannah Port Of Entry

Pennyworth Island

Hutchinson Island

Eugene Talmadge Memorial Bridge

The Great Savannah Exp And Visitors Cir

Southbridge Golf Club

Alabama Junction

Florida Junction

Tremont Park

Ogeecheeton

Savannah Lookout Tower

Union Junction

Liberty City

Richfield

Tatumsville

Memorial Medical Center

Candler Hospital

Kensington Park

Bacon Park Golf Course - Cypress/Magnolia

Highland Park

Fairfield

Shirley Park

Fairway Oaks

Bona Bella

Savannah Golf C

Gordonston

Victory He

Sunset Park

Fernwood

Parkwood

Savannah St

Bona Bella

City Hall

Chamber Of Commerce

Green-Meldrim Home

Forsyth Park

Ardsley Park

Daffin Park

Larosche Park

Fairfield

Shirley Park

Fairway Oaks

Highland Park

Factors Walk

Telfair Mansion And Art Museum

Ft Wayne

E PRESIDENT

E HENRY

E ANDERSON

E 37TH

E 52ND

E 58TH

E DE RENNE

DAWAY RD

ARD FOSS

Lepag

Pine Ga

Savannah Golf C

E GWINNETT

Gordonston

EVANS VYANIA

BONA VE

Victory He

Sunset Park

Fernwood

Parkwood

Savannah St

Bona Bella



Southern Oaks Dr

Chatham Center

Chatham Center S

Chatham Center Dr

16

Jim Gillis Historic Savannah Pkwy

Safety 1st Rd

Blossom Ave

Blossom Dr

Elm Dale Ave

Westgate

Patton Rd

Ogechee Rd

Mont Rd

ATTACHMENT B
System photographs



CTS-24556

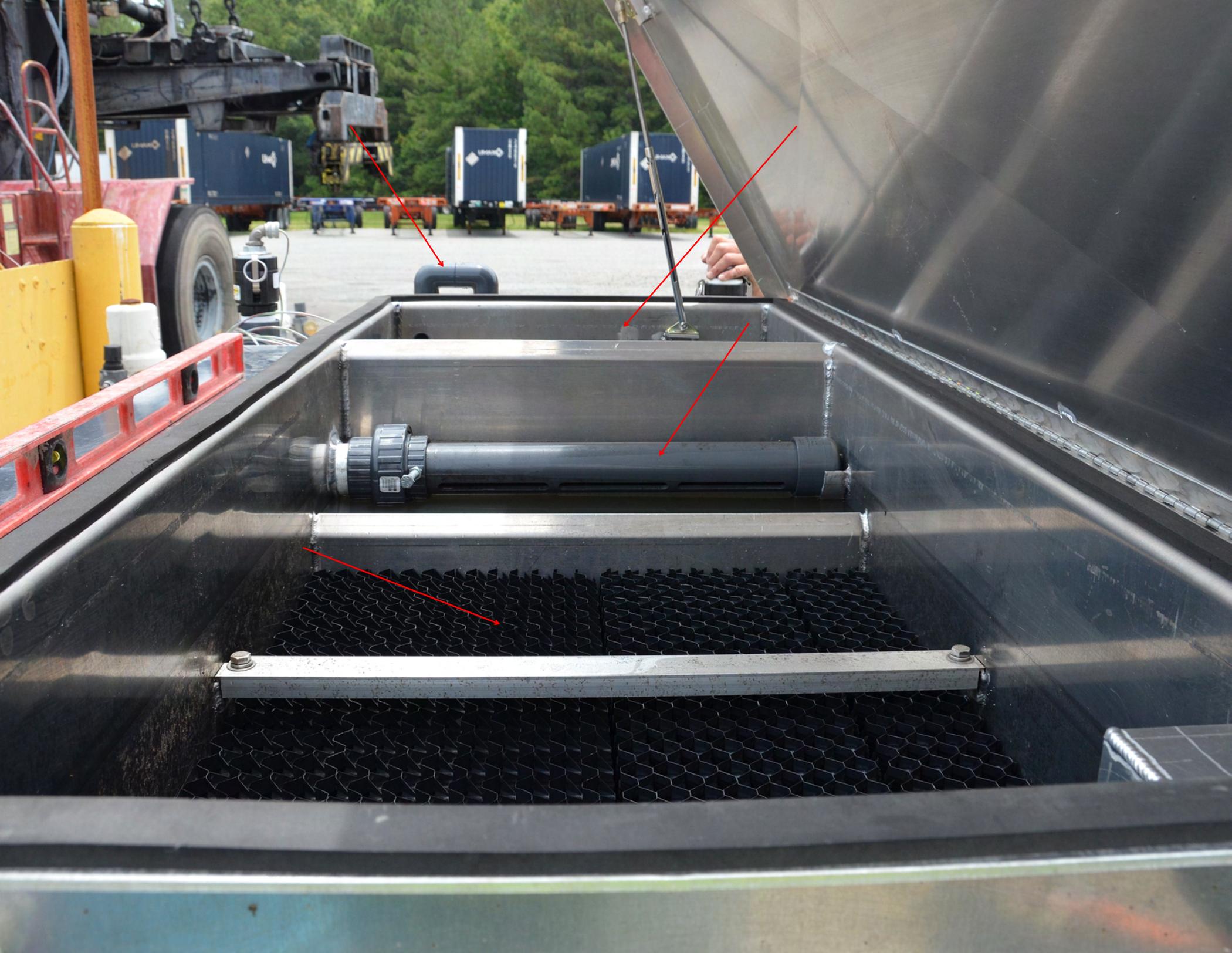
T2
MOTOR OIL
275 GALS

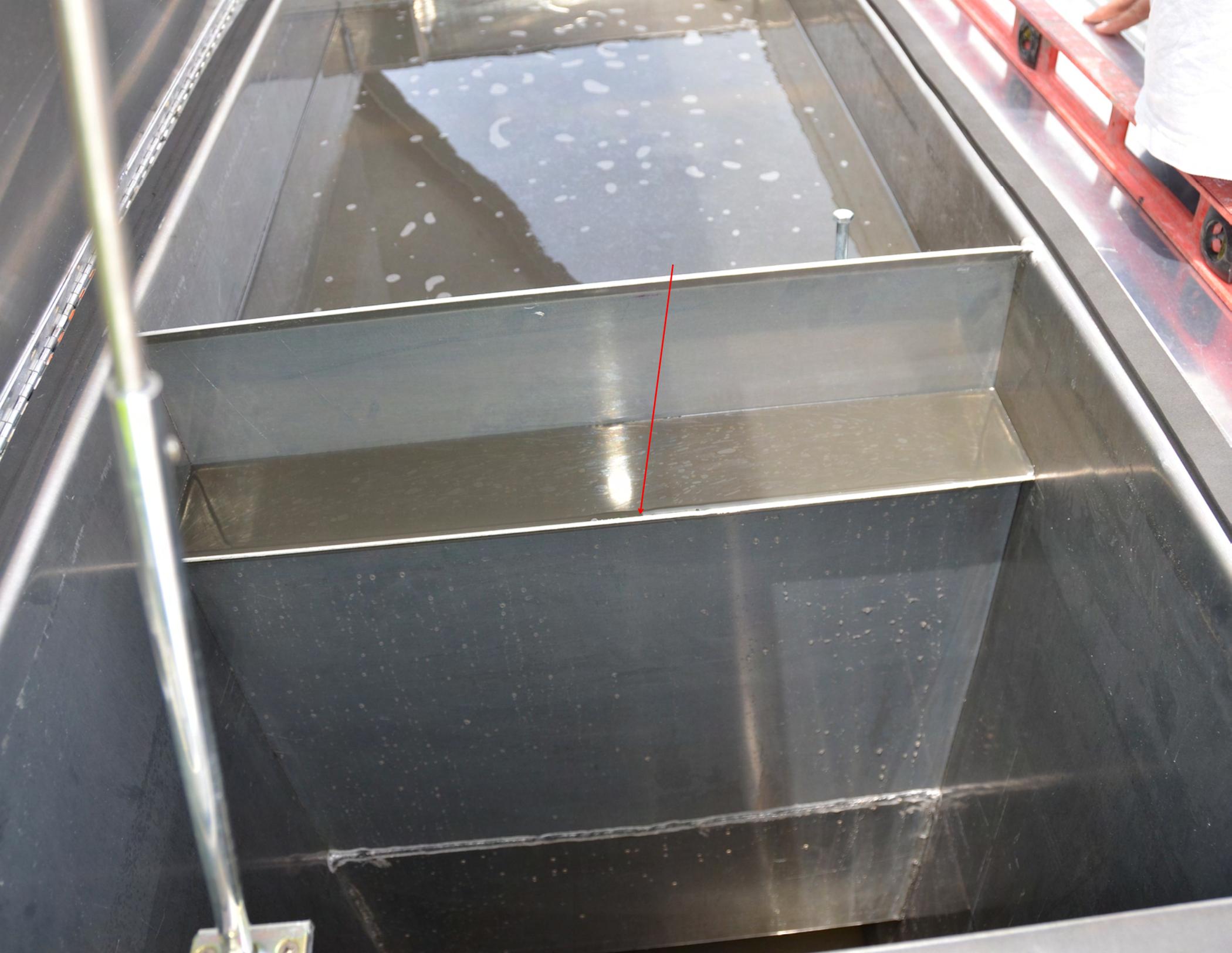
T1
275
GALS

D2
320 GALS

D1
320 GALS

13303







T3
USED OIL
50 GALS

T3
USED OIL
50 GALS



55 GALLON DRUM
MATERIAL SAFETY DATA SHEET
SEE BACK OF DRUM FOR FULL MSDS
www.chemcentral.com

55 GALLON DRUM
MATERIAL SAFETY DATA SHEET
SEE BACK OF DRUM FOR FULL MSDS
www.chemcentral.com

Master

70071828



Inlet

EFF

IN

Instructions for use
Instructions for use
Instructions for use

MADE IN USA
AIR & WATER - 1" I.D. - 200 PSI - MADE



Inlet

Outlet

EFF

Warning: Do not...
Pressure...
Effluent pressure and sample port



T3
USED O
150 GAL

45
Intermodal

TTX



13303

240 VOLTS

I ON

CAUTION & DISCONNECT POWER BEFORE SERVICING EQUIPMENT

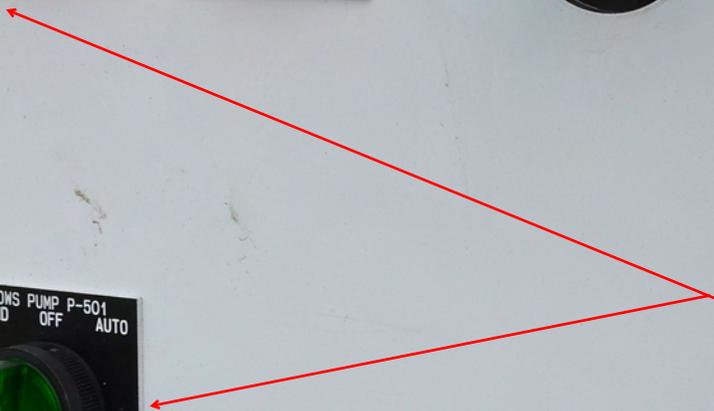
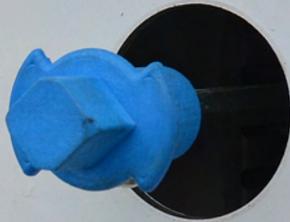
DANGER
Electrocution risk.
Do not touch live parts.
Do not work on wet or damp surfaces.
Do not use tools or equipment that are not properly grounded.
Do not use ladders or scaffolding that are not properly secured.
Do not touch live parts.
Do not touch live parts.
Do not touch live parts.



DANGER
Arc flash and shock hazard.
Appropriate PPE required.

T2
MOTOR
275 G

D2

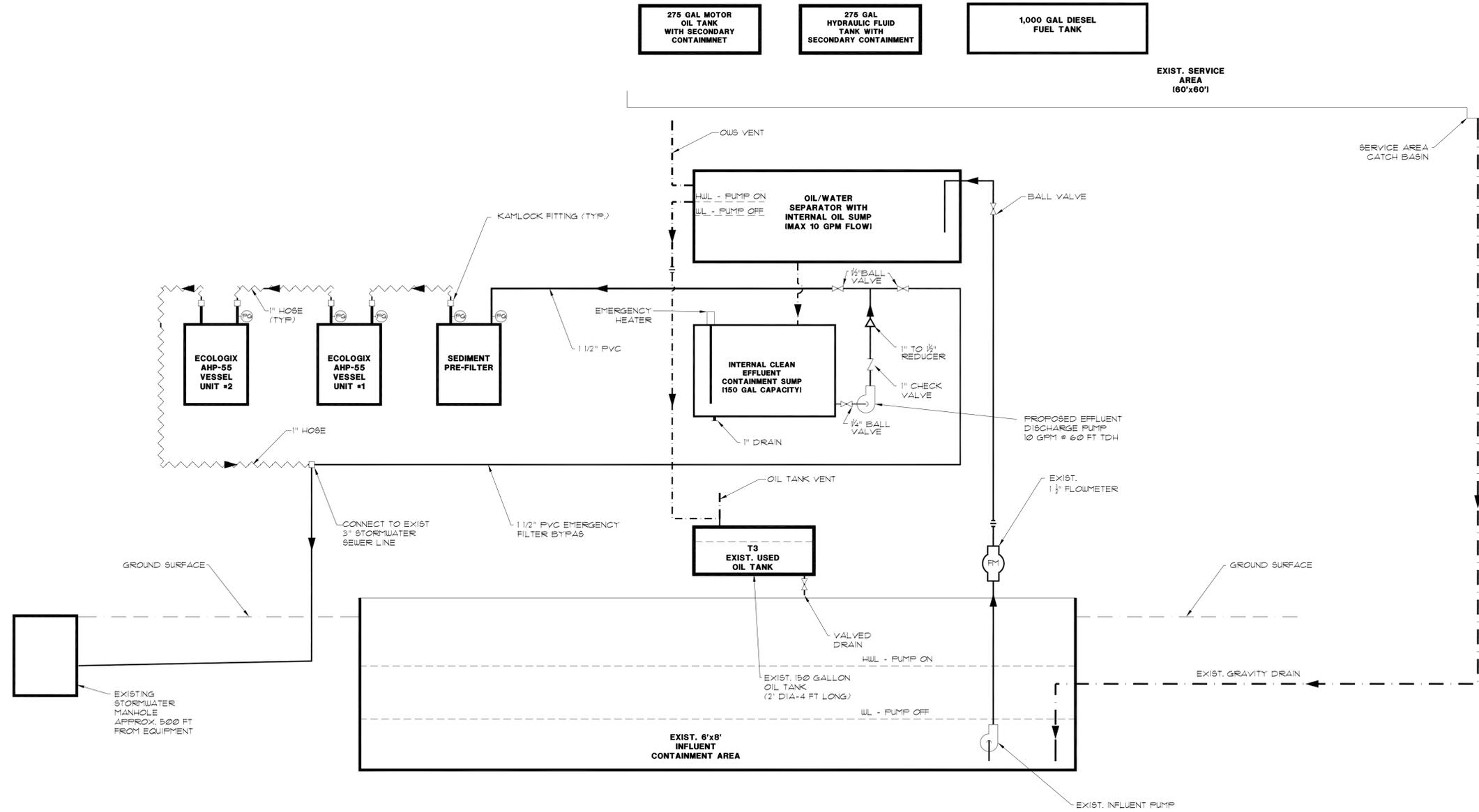




ATTACHMENT C

System Drawings

LAST REVISION: 07/02/11
 LAST PLOTTED: 07/02/11
 DRAWING SCALE: NTS
 PLOT SCALE: 1=1



CSX INTERMODAL TERMINALS, INC.
 TERMINAL DEVELOPMENT GROUP
 JACKSONVILLE, FLORIDA

AS-BUILT DRAWINGS
 I hereby certify that these "As-Built Drawings" reflect the construction completed and approved by me. I am a duly licensed Professional Engineer in the State of Florida. I have prepared these drawings and certify that they are true and correct to the best of my knowledge and belief.
 ENGINEER: _____ DATE: _____

PROJECT No.
10030201.001
 SHEET
P1 of 1

PIPING SCHEMATIC
 3000 TREMONT AVENUE
 SAVANNAH, GEORGIA 31405

AL ANDREANSKY, P.E.
 P.O. BOX 456
 PALM HARBOR, FLORIDA 34682-0456
 PHONE: (727) 460-8612, FAX: (727) 789-9565

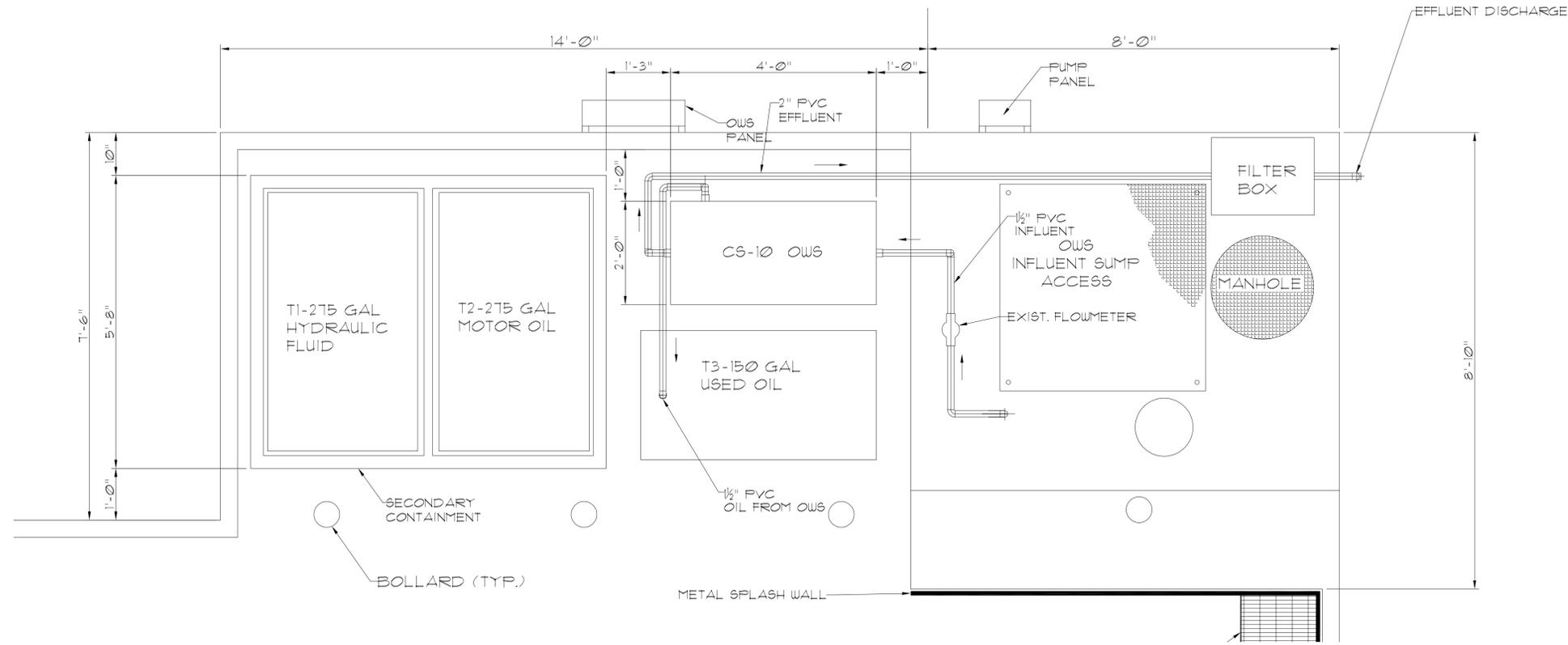
CAD FILE: 10030201M SCALE: NTS
 DRAWN BY: A.A. DATE: 04-02-11
 CHECKED BY: DATE:
 APPROVED BY: DATE:

SCALE VERIFICATION
 THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING
 0 1"
 USE TO VERIFY FIGURE

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 THE DRAWING, SPECIFICATIONS AND SHALL BE THE PROPERTY OF CSX. IT IS TO BE KEPT IN CONFIDENTIALITY AND NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.

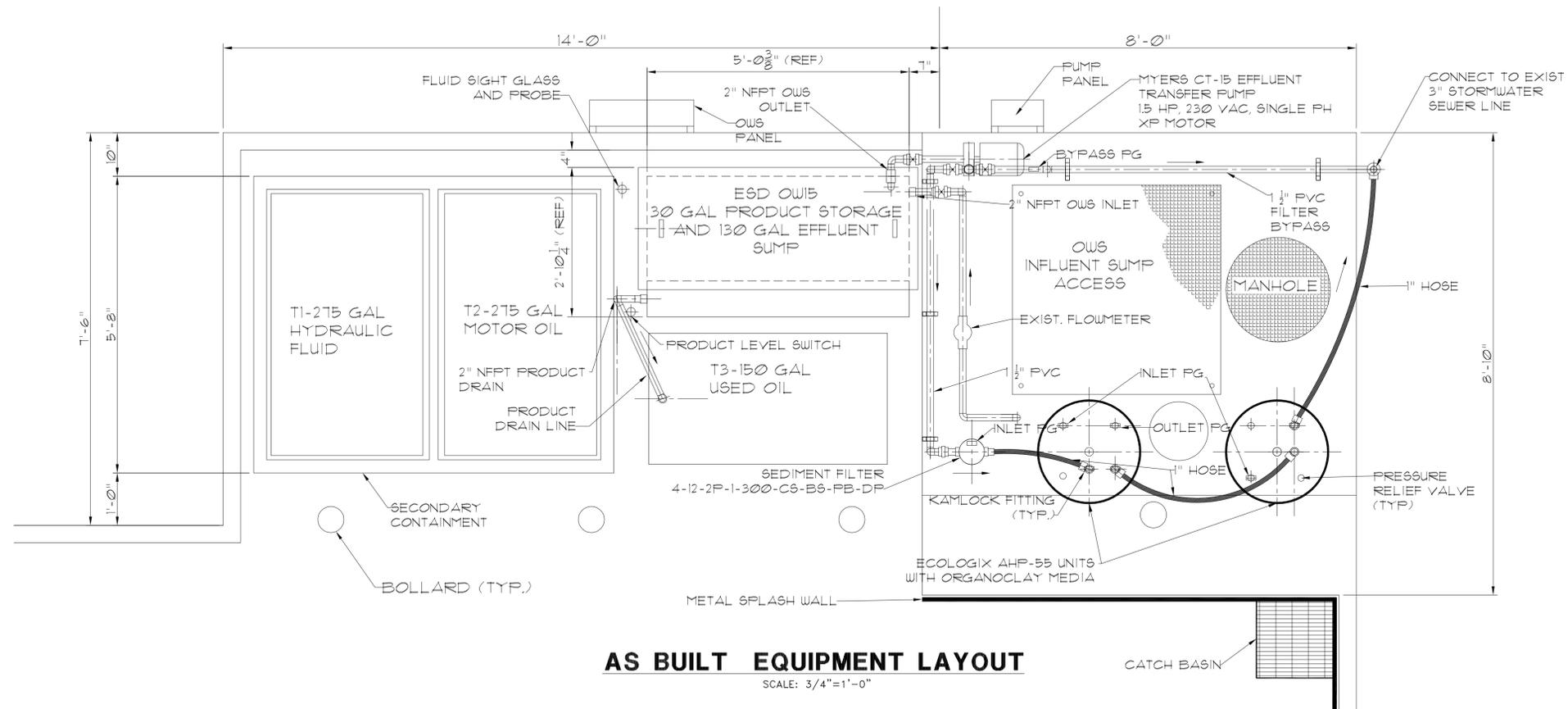
REV.	DATE	DESCRIPTION

OIL WATER SEPARATOR REPLACEMENT, CSX INTERMODAL, JACKSONVILLE, FLORIDA



PRE-CONSTRUCTION EQUIPMENT LAYOUT

SCALE: 3/4"=1'-0"



AS BUILT EQUIPMENT LAYOUT

SCALE: 3/4"=1'-0"

LAST REVISION: 07/02/11
 LAST PLOTTED: 07/02/11
 DRAWING SCALE: 3/4"=1'
 PLOT SCALE: 1=1

CSX INTERMODAL TERMINALS, INC.
 TERMINAL DEVELOPMENT GROUP
 JACKSONVILLE, FLORIDA



AS-BUILT DRAWINGS
 I hereby certify that these "As-Built Drawings" reflect the construction process. They are based upon, and subject to, the contribution to the best of my knowledge and belief.
 ENGINEER: _____ DATE: _____

PROJECT No. 10030201.001
 SHEET M1 of 1

EQUIPMENT LAYOUT
 3000 TREMONT AVENUE
 SAVANNAH, GEORGIA 31405

AL ANDREANSKY, P.E.
 P.O. BOX 456
 PALM HARBOR, FLORIDA 34682-0456
 PHONE: (727) 460-8612, FAX: (727) 789-9565

CAD FILE: 10030201M SCALE: 3/4"=1'
 DRAWN BY: A.A. DATE: 04-02-11
 CHECKED BY: DATE:
 APPROVED BY: DATE:

SCALE VERIFICATION
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REV.	DATE	DESCRIPTION

OIL WATER SEPARATOR REPLACEMENT, CSX INTERMODAL, JACKSONVILLE, FLORIDA

ATTACHMENT D

Oil Water Separator

Control Panels and Telemetry



ESD Waste2Water, Inc.'s Control Panels can be designed and fabricated to meet a wide variety of applications from the simplest pump controller to a full system interface for remediation or industrial systems. All panels are constructed in our UL approved panel shop and carry the UL label.

Standard Features:

- Lockable NEMA IV 16 gauge steel enclosures
- Inner swing out door
- IEC contactors and motor protectors
- Short circuit protection for all devices
- Hand /Off/Auto switches for all motors
- Green Run Lights and Red Alarm lights
- Single point power input
- Relay based controls or your choice of Programmable Logic Controller
- Full documentation with Auto-Cad drawings, load summary, loop description, components list and specification sheets
- Parts warranty and guaranteed workmanship

Options:

- Auto-dialer for alarms and shutdowns
- Telemetry units
- SCADA data logging units
- Uninterruptible power supplies
- Amp meters
- Run time meters



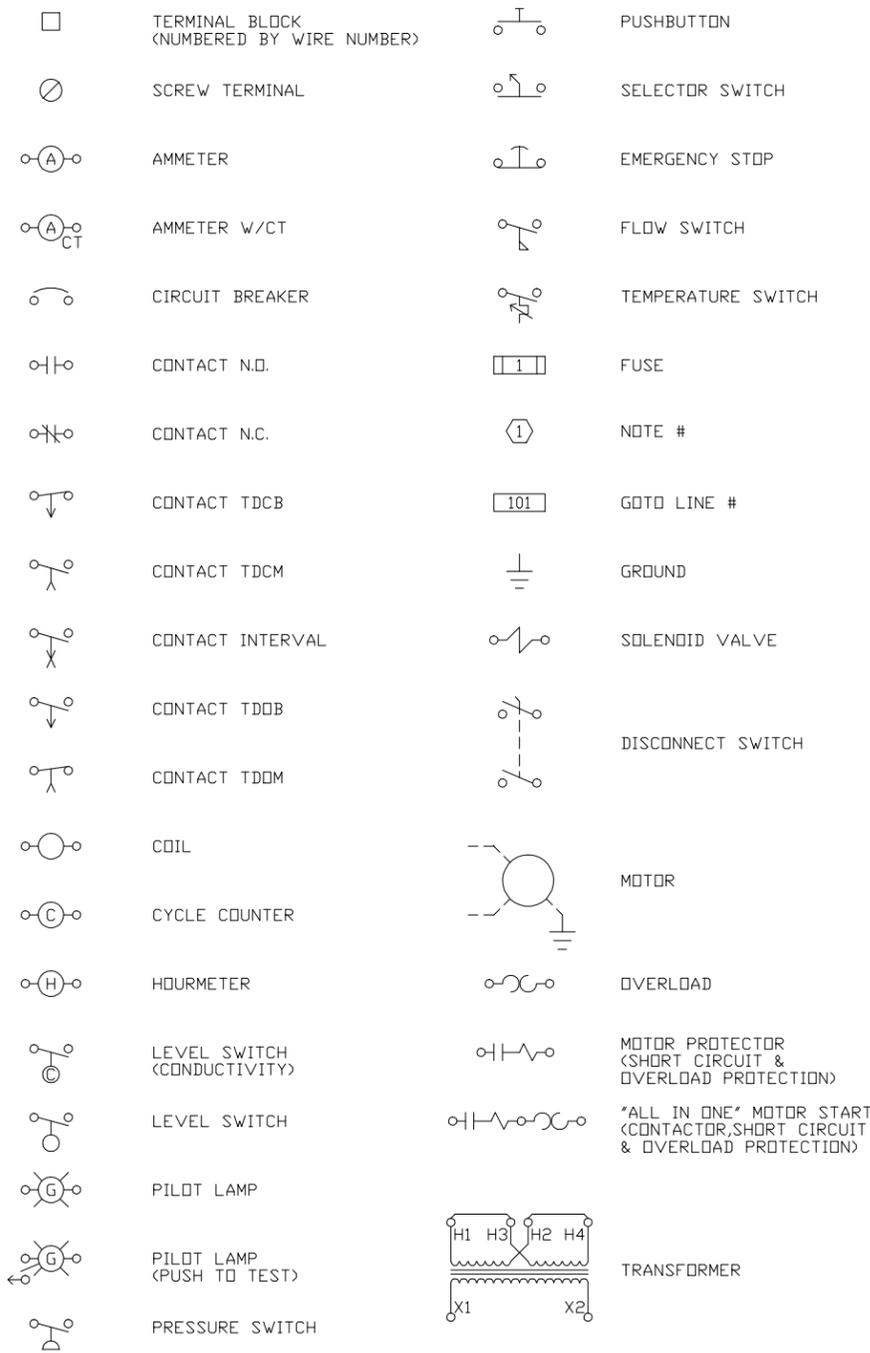
Thank you for allowing ESD to provide a solution to your equipment needs.



ESD Waste2Water, Inc.
495 Oak Road
Ocala, FL 34472
Tel: 800.277.3279 Fax: 352.680.9278
www.waste2water.com



LEGEND:



ELECTRICAL COMPONENT ABBREVIATIONS:

- AM AMMETER
- CB CIRCUIT BREAKER
- CR CONTROL RELAY
- FU FUSE
- GFCI GROUND FAULT CIRCUIT INTERRUPTER
- HM HOUR METER
- HS HAND/SELECTOR SWITCH
- ISR INTRINSICALLY SAFE RELAY
- ISAR INTRINSICALLY SAFE ANALOG REPEATER
- MC MOTOR CONTACTOR
- MP MOTOR PROTECTOR
- MS MOTOR STARTER
- OL OVERLOAD
- PB PUSHBUTTON
- PL PILOT LIGHT
- PM PHASE MONITOR
- SP SURGE PROTECTOR
- SS SOFT START
- TB TERMINAL BLOCK
- TR TIME DELAY RELAY
- TMR 7 DAY TIMER
- VFD VARIABLE FREQUENCY DRIVE
- XFMR TRANSFORMER

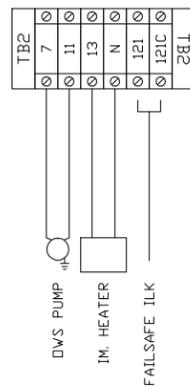
PROCESS DEVICE ABBREVIATIONS:

- LS- LEVEL SWITCH
- LT- LEVEL TRANSMITTER
- LSHH- LEVEL SWITCH HIGH-HIGH
- LSH- LEVEL SWITCH HIGH
- LSL- LEVEL SWITCH LOW
- LSLL- LEVEL SWITCH LOW-LOW
- PS- PRESSURE SWITCH
- PT- PRESSURE TRANSMITTER
- PSLL- PRESSURE SWITCH LOW-LOW
- PSHH- PRESSURE SWITCH HIGH-HIGH
- TS- TEMPERATURE SWITCH
- TT- TEMPERATURE TRANSMITTER
- TSHH- TEMPERATURE SWITCH HIGH-HIGH
- FS- FLOW SWITCH
- FT- FLOW TRANSMITTER
- FQ/FT- FLOW TOTALIZER W/PULSE

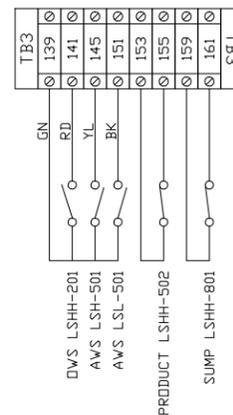
NOTES:

- 1) LABEL: INSTALLER TO PROVIDE EQUIPMENT GROUNDING CONDUCTOR WHICH SHALL BE #6AWG.
- 2) ALL POWER WIRING SHALL BE #12AWG UNLESS OTHERWISE NOTED.
- 3) ALL 120VAC CONTROL WIRING SHALL BE #16AWG RED(LINE) OR WHITE(NEUTRAL) UNLESS OTHERWISE NOTED.
- 4) ALL 24VAC CONTROL WIRING SHALL BE #16AWG BLACK(LINE) OR GRAY(NEUTRAL) UNLESS OTHERWISE NOTED.
- 5) ALL DISCRETE DC CONTROL WIRING SHALL BE #16AWG YELLOW(+) OR YELLOW W/BLK STRIPE(-).
- 6) ALL ANALOG DC WIRING SHALL BE 600V #18AWG SHIELDED CABLE UNLESS OTHERWISE NOTED.
- 7) ALL INTRINSICALLY SAFE WIRING IN PANEL SHALL BE #22AWG BLUE.
- 8) INSTALL ALL INTRINSICALLY SAFE CABLE AND EQUIPMENT IN ACCORDANCE WITH ARTICLE 504 OF THE NATIONAL ELECTRICAL CODE.
- 9) MAXIMUM LENGTH OF ANY CABLE CONNECTED TO ANY I. S. BARRIER SHALL BE 10,000 FEET.
- 10) U.L. 508A AND 698A LISTED CONTROL PANEL.
- 11) INSTALLER TO PROVIDE BRANCH CIRCUIT PROTECTION WHICH SHALL BE A 30 AMP INVERSE TIME CIRCUIT BREAKER OR 30 AMP CLASS J TIME DELAY FUSES.

TERMINAL CONNECTIONS:



INTRINSICALLY SAFE TERMINAL CONNECTIONS:



ESD
Waste2Water
495 OAK ROAD
OCALA, FL 34472

PREPARED FOR:

AL ANDREANSKY
PALM HARBOR, FL

PROJECT NAME:

CSX TREATMENT
SYSTEM

TITLE:

ELECTRICAL

DRAWN BY:

DSH

ENGINEERING:

MFG:

QC:

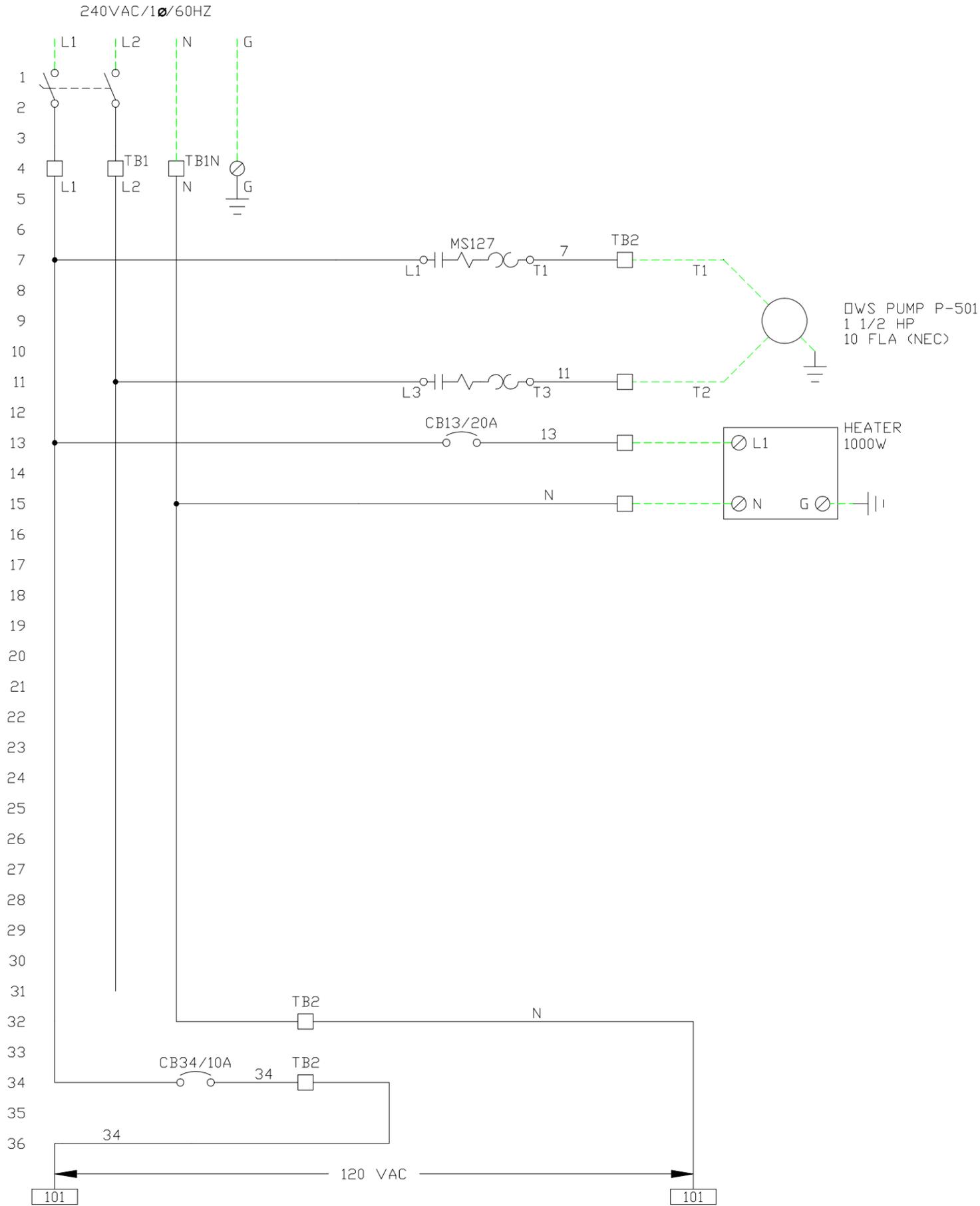
DATE: 05/03/11

DWG NO: 13303-5-00

SCALE:

NTS

SHEET:



ESD
 Waste2Water
 495 OAK ROAD
 OCALA, FL 34472

PREPARED FOR:
 AL ANDREANSKY
 PALM HARBOR, FL

PROJECT NAME:
 CSX TREATMENT
 SYSTEM

TITLE:
 ELECTRICAL

DRAWN BY: DSH

ENGINEERING:

MFG:

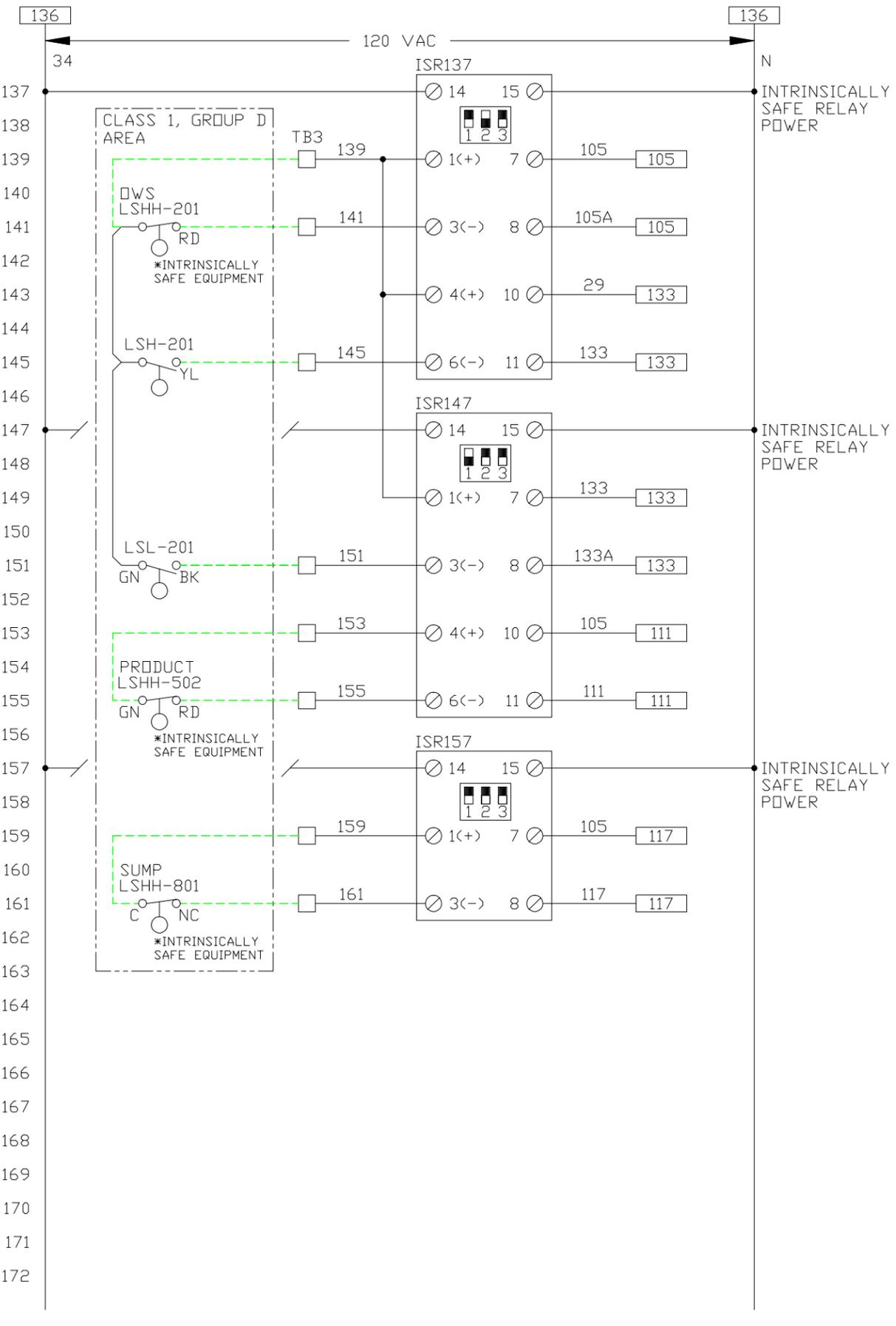
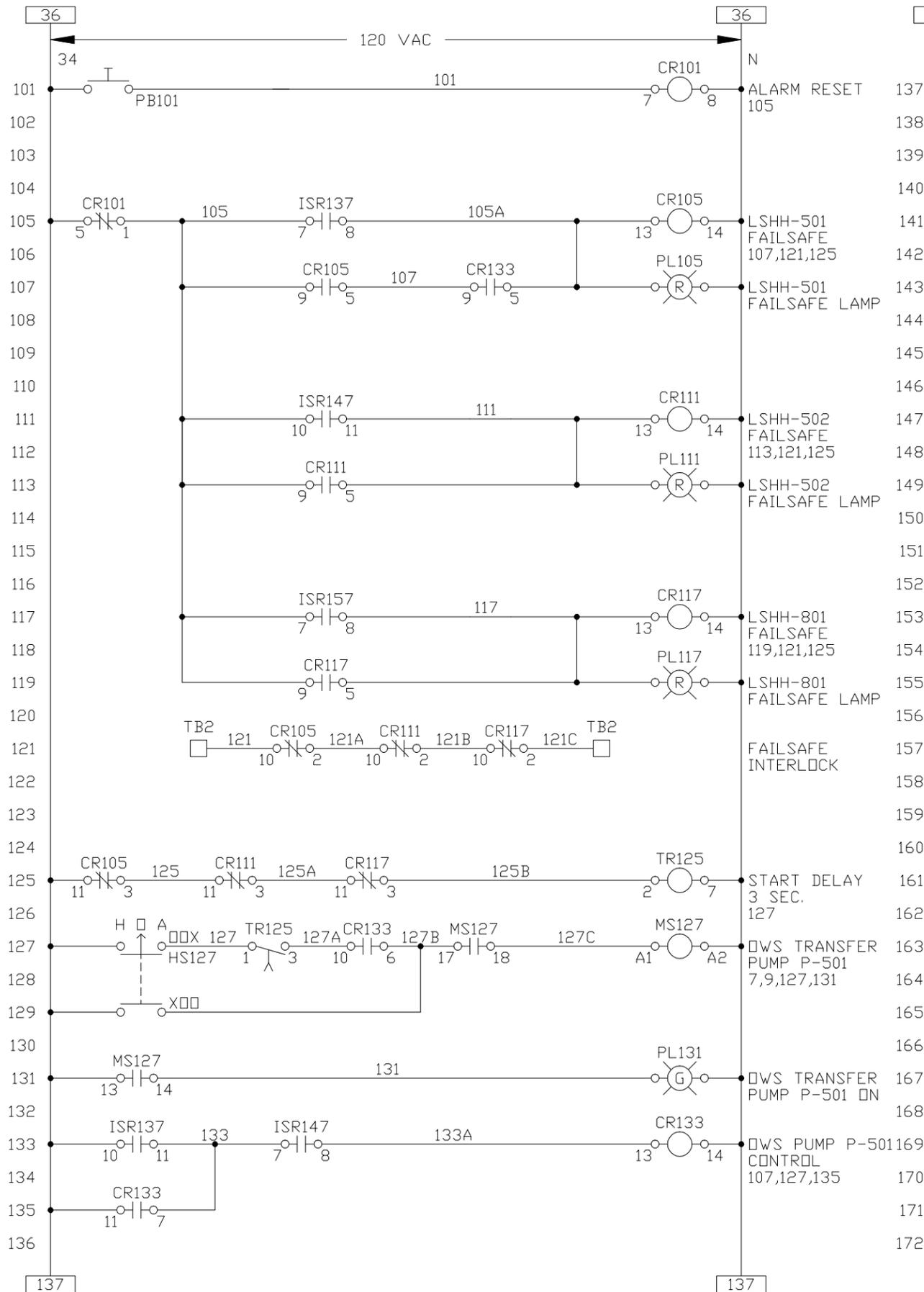
QC:

DATE: 05/03/11

DWG NO: 13303-5-01

SCALE: NTS

SHEET:




Waste2Water
 495 OAK ROAD
 OCALA, FL 34472

PREPARED FOR:
 AL ANDREANSKY
 PALM HARBOR, FL

PROJECT NAME:
 CSX TREATMENT
 SYSTEM

TITLE:
 ELECTRICAL

DRAWN BY: DSH

ENGINEERING:

MFG:

QC:

DATE: 05/03/11

DWG NO: 13303-5-02

SCALE: NTS

SHEET:

Enhanced Oil/Water Separator



ESD Waste²Water, Inc. manufactures a complete line of above ground corrugated plate enhanced oil/water separators. The separators are designed to remove free and dispersed non-emulsified oil and settable solids in accordance with API 421.

All of the **ESD Waste²Water, Inc.** oil/water separators are manufactured out of 5052 H32 marine grade aluminum or stainless steel.

Typical applications:

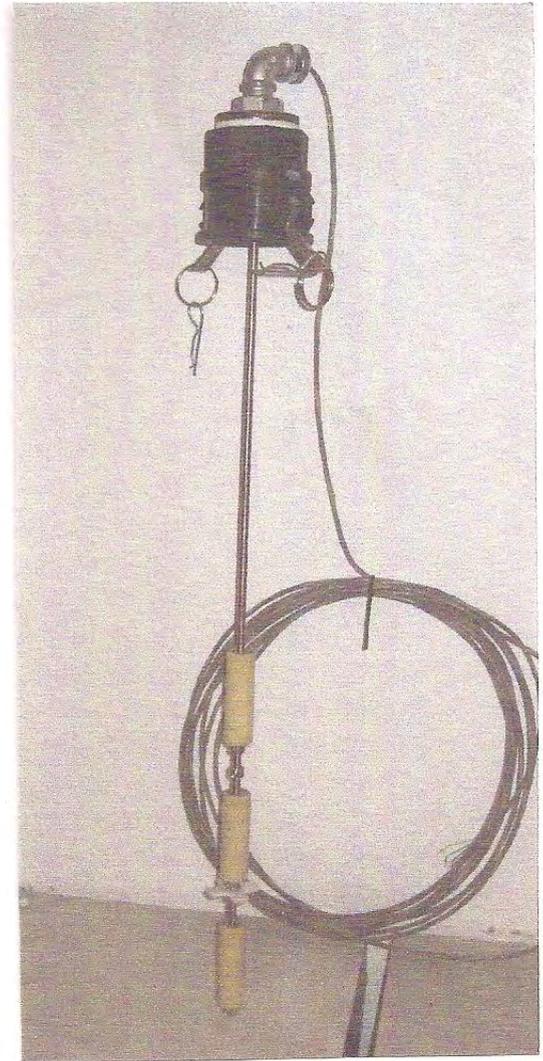
- Groundwater Treatment
- Equipment and Vehicle Washing
- Aircraft Maintenance Operations
- Oil Field Services
- Food Processing
- Storm Water Runoff
- Floor Drains
- Bulk Storage Facilities



Certified to UL-508A Standards



Custom Multi - Level Probes



ESD Waste2Water, Inc.

Our Multi-Level Probes can be designed and fabricated to meet a wide variety of applications.

Standard Features:

- * Reed Switches come with Rhodium contacts
- * Floats are constructed from Ridged Urethane w/ embedded ceramic magnets
- * Float Rod is constructed from 316 Stainless Steel tubing
- * 30' of Plenum rated 22Ga. wire
- * 2" Type D camlock

Standard Wiring Schmatic

Green = Common
Black = Low
Yellow = High
Red = High High

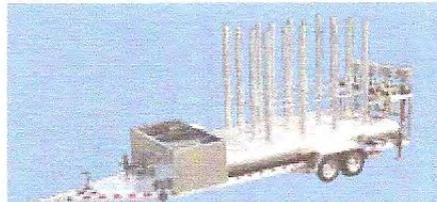
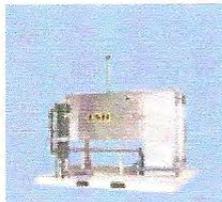
Options:

- * Custom Stem Lengths
- * Custom Float Switch configurations
- * Custom Cable lengths



Certified to UL-508A Standards

Thank you for allowing ESD to provide a solution to your equipment needs.

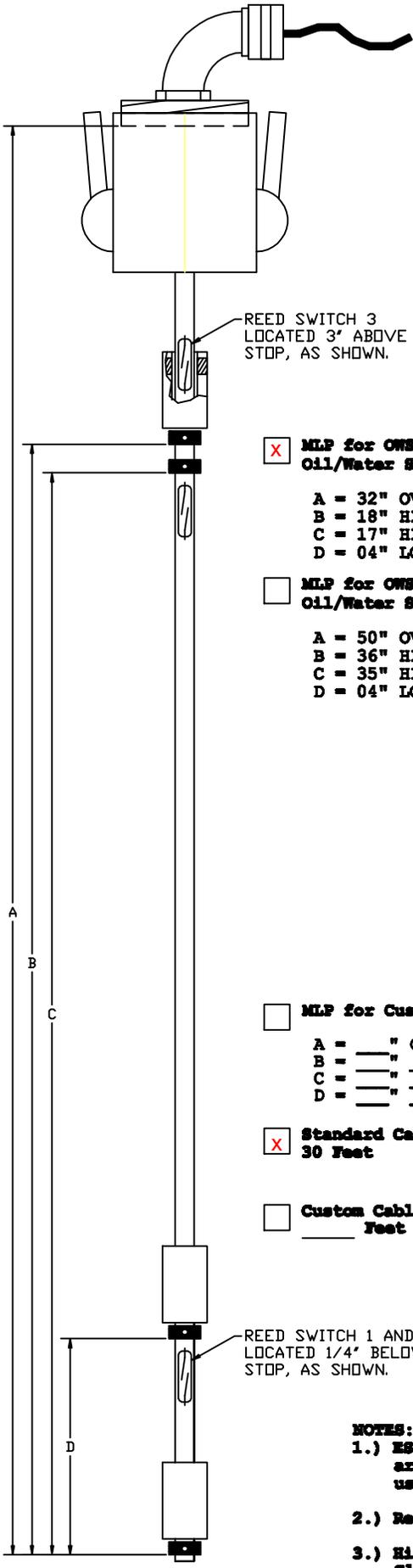


ESD Waste2Water, Inc.
495 Oak Road
Ocala, FL 34472
Tel: 800.277.3279 Fax: 352.680.9278
www.waste2water.com



SCHEMATIC

ID	USES	WIRE COLOR
C	COMMON	GREEN
1	LOW	BLACK
2	HIGH	YELLOW
3	HIGH HIGH	RED



REED SWITCH 3
LOCATED 3" ABOVE
STOP, AS SHOWN.

MLP for OWS-10/25
Oil/Water Separator Application

- A = 32" OVER ALL LENGTH
- B = 18" HIGH HIGH
- C = 17" HIGH
- D = 04" LOW

MLP for OWS-50
Oil/Water Separator Application

- A = 50" OVER ALL LENGTH
- B = 36" HIGH HIGH
- C = 35" HIGH
- D = 04" LOW

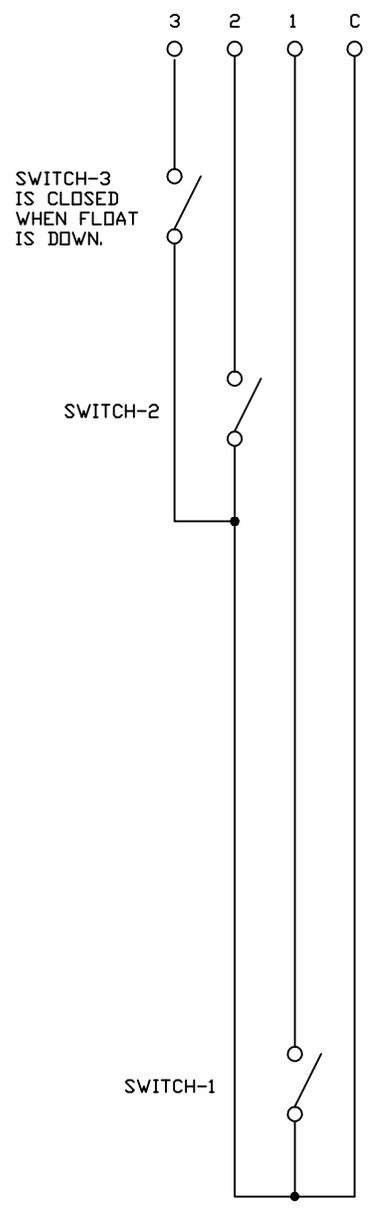
MLP for Custom Application

- A = _____" OVER ALL LENGTH
- B = _____"
- C = _____"
- D = _____"

Standard Cable Length
30 Feet

Custom Cable Length
_____ Feet

REED SWITCH 1 AND 2
LOCATED 1/4" BELOW
STOP, AS SHOWN.



SWITCH-3
IS CLOSED
WHEN FLOAT
IS DOWN.

SWITCH-2

SWITCH-1

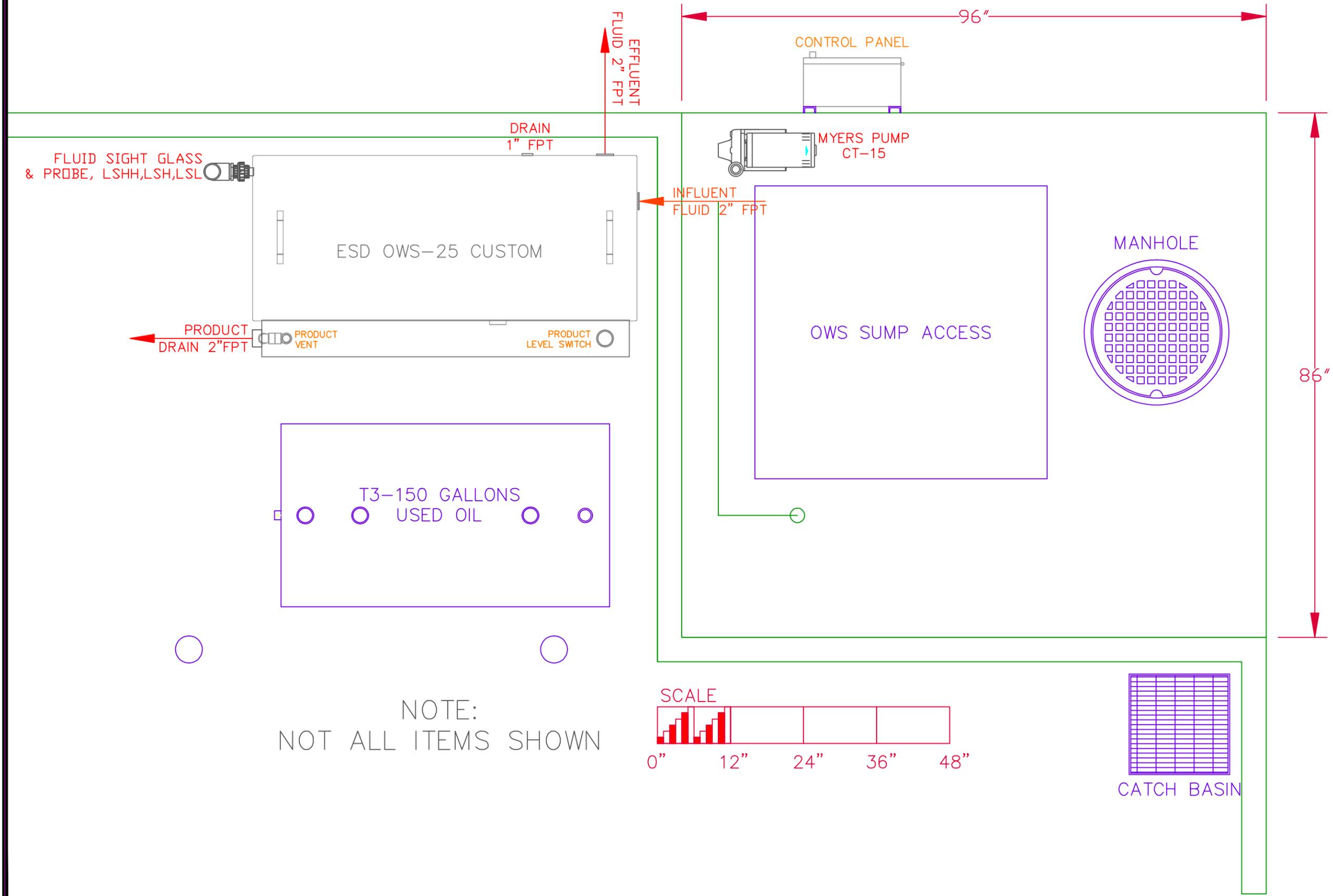
PLAN VIEW

NOTES:

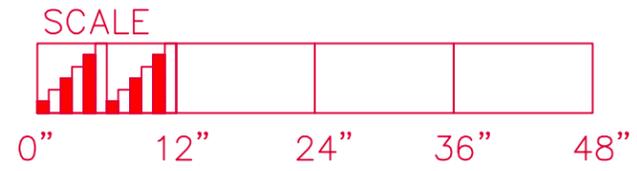
- 1.) ESD Waste2Water Multilevel Probes are intended for Low Voltage use only! (not to exceed 24volts)
- 2.) Reed Switches 1 & 2 are normally open.
- 3.) High High = Switch-3(Red wire) is Closed when float is down.
- 4.) Installed in CAMLOCK (type D)

<p>MULTILEVEL PROBE</p>	<p>DWG NO: MLP-OWS-03</p>	<p>DATE: 04/30/09</p>
<p>495 Oak Road Ocala, FL 34472 PHONE: (800) 277-3279 FAX: (352) 867-1320</p>		
<p>ESD Waste2Water</p>		
<p>OWS 3 MULTI-LEVEL PROBE</p>		

DATE 05/13/11 BY CUST REVISION REV-1



NOTE:
NOT ALL ITEMS SHOWN



ESD
Waste2Water
495 Oak Road
Ocala, FL 34472

PREPARED FOR:
AL ANDREANSKY P.E.
PALM HARBOR, FL

PROJECT NAME:
CSX TREATMENT
SYSTEM

TITLE:
LAYOUT

DRAWN BY: MLB

ENGINEERING: MF

MFG: 01 OF 01

QC:

DATE: 04/06/11

DWG NO: 13303-3-01

SCALE: NTS

SHEET:

ATTACHMENT E

Sediment Pre-Filter



Installation, Operation, & Maintenance Manual

1. Installation - Filter Housing

Please remove all shipping and crating materials carefully.

The Filter Housing is capable of having several different piping variations based upon the outlet style of your housing. The inlet should be connected to the inlet flange or coupling, located near the top of the unit (above the basket level).

The outlet service line should be connected to the outlet flange or coupling, located near the middle or bottom of the housing depending upon the style of your housing (below basket level).

Some installation requires electrical grounding of all equipment, be sure to provide adequate grounding where necessary.

After completing installation be sure to double check connections for integrity. Your Filter Housing has been factory pressure tested leak free, therefore any seepage problems usually occur from improper installation connections.

You are now ready to install the filter basket and bag. Remove cover by loosening the cover eye nuts. The eye nuts in the slotted corners should be loosened sufficiently to wing free. Loosen the third eye nut sufficiently to allow the top cover and closure assembly to swing away from the top of the unit.

Place the basket into the filter housing; make sure the basket flange is firmly seated on top of the basket collar.

Insert the bag basket making sure filter bag ring is firmly seated on top of the basket flange. For best results, be sure filter bag is installed fully extended to the bottom of the basket.

Before replacing cover assembly, inspect cover seal gasket (replacing as necessary). Close cover and alternately tighten the three clamp assemblies evenly to ensure a leak proof seal between the cover and housing body. Torque closure assemblies evenly to ensure a leak proof seal between the cover and housing body. Torque closure assemblies to a maximum of 60-90ft-lbs. Each installation may have different closure bolting torque requirements to effectively seal filter housing cover. Many installations require significantly lower closure bolting torque due to the variable explained below. The suggested torque values are for reference only. They are to be used as a guideline by maintenance personnel. These values are meant as a guideline for safe operation of the filter housing at its maximum rated pressure. Many variables affect the torque required to operate the filter housing without

leaks. These variables include the diameter of the bolt, type and number of threads, material type and grade, condition of the nut bearing surface and lubrication of bolt threads and nut bearing surfaces. Other factors such as the condition of the o-ring, o-ring material, viscosity of the fluid being filtered, operating pressures, temperature, and the closure assembly tightening procedure must also be considered.

Your filter housing is now ready for operation!

2. Operation

Filter System Start-Up Procedure:

Prior to turning on the flow to the inlet service, please make the following checks:

1. Check inside the filter housing to be sure basket and filter bag (if applicable) are in housing and do not require cleaning or replacement. If necessary install a clean filter basket and bag (if applicable).
2. Check that filter housing unit cove is securely fastened to the housing. You are now ready to open flow to the inlet service line. Slowly open the inlet service approximately 25% of normal operational flow (open slowly as not to displace filter bag inside housing). After filter housing is pressurized and vented, slowly open outlet service line unit valve until completely open. Complete opening of inlet service line until desired flow rate is reached.

Once the desired service flow has been established, the filter will operate efficiently until dirty. However, under no circumstances should more than 15 PSI Differential Pressure through the filter be obtained. Operating the filter housing with a high differential may cause filter bags to rupture and/or cause damage to the filter system and downstream equipment.

To prevent excessive drop through the filter housing, regular inspections of the media is required monitoring of differential pressure through the housing can be utilized as a means of determining whether or not the filter media needs cleaning or replacement.

When it becomes necessary to clean or replace filter media, follow the procedure outlined below:

1. First close the flow from the inlet service line.



2. Close the flow to the outlet service line. (In some applications closing flow to outlet is not required).
3. Relieve the pressure from the filter housing.

<p style="text-align: center;">WARNING!</p> <p style="text-align: center;">CONTENTS UNDER PRESSURE Relieve Pressure in accordance with Manufacturer's instructions before opening the Filter Vessel.</p> <p style="text-align: center;">FAILURE TO DO SO MAY RESULT IN SERIOUS BODILY INJURY!</p>

4. Drain Housing sufficiently to access filter basket
5. Remove cover by loosening the cover eye nuts. The eye nuts in the slotted corners should be loosened sufficiently to swing free. Loosen the third eye nut sufficiently allow the top cover and closure assembly to swing away from the top of the unit.
6. Remove filter basket and clean thoroughly, remove the filter bag (if applicable) and throw away. (Cleaning and reusing the filter bag is not recommended.)
7. Remove debris and sludge from inside the inlet portion of housing to avoid interference with cover seal or flow of fluid being filtered.
8. Remove basket seal (if applicable) and inspect, replace if necessary.
9. Install clean filter basket and filter bag (if applicable). Place the basket into the filter housing, make sure the basket flange is firmly seated on the basket collar. If applicable, insert bag on top of the bag basket flange making sure the filter bag ring is firmly seated inside the basket flange. For best results, be sure filter bag is installed fully extended to the bottom of the basket.
10. Inspect cover gasket for cuts or other signs of failure and make sure it is properly seated.
11. Move cover back into position, and alternately tighten the three clamp assemblies to a minimum of 60-90 ft-lbs. Higher torque may be required



depending on your application and filter condition.

Your filter housing is now ready for operation. Refer to filter system start up procedure.

3. Spare Parts List

Your filter housing unit will give you many years of reliable service provided periodic inspections are made of various components and replacement of worn parts are made promptly. The following is meant to be recommended spare parts list.

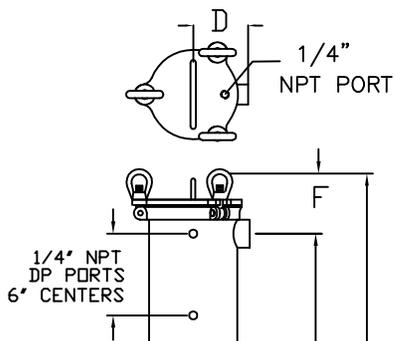
SPART PARTS LIST			
#	Description	Part Number	Recommended
1	Cover Seal	(See Order)	As needed
2	Cover	(See Order)	As needed
3	Eye Nut	(See Order)	As needed
4	Rod End	(See Order)	As needed
5	Clevis Pin Assembly	(See Order)	As needed
6	Filter Bag	(See Order)	As needed
7	Filter Basket	(See Order)	As needed

* Select Material Designation: AL = Aluminum B = Buna
C = Carbon Steel E = Ethylene Propylene
4S = 304 Stainless Steel V = Viton
6S = 316 Stainless Steel ST= Solid Teflon
TS = Teflon Encapsulated Viton

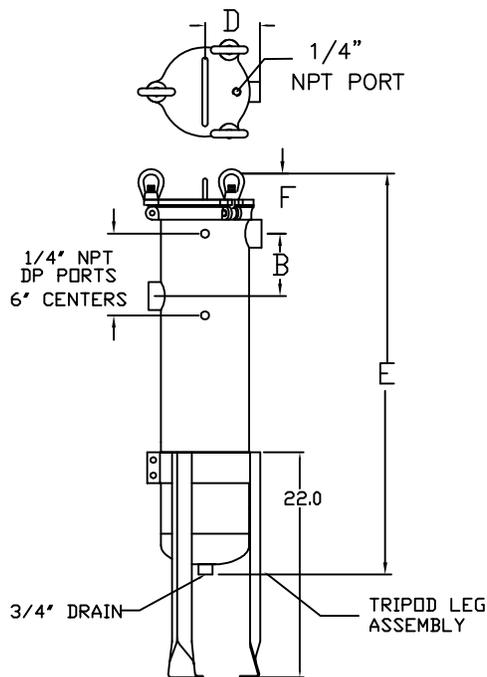


CARBON STEEL

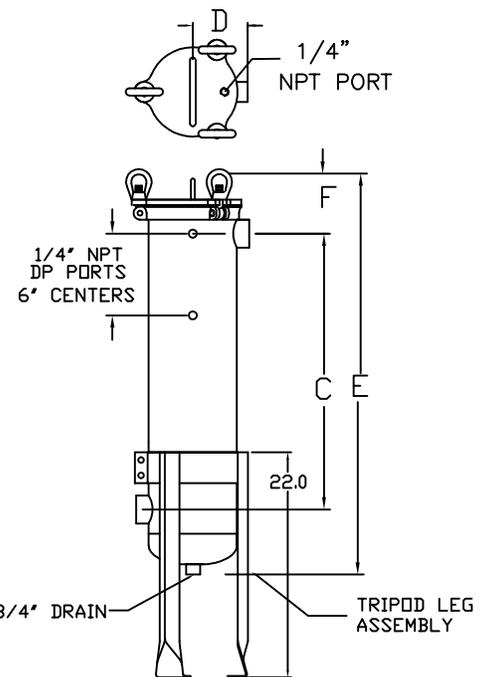
304-316 STAINLESS STEEL



STYLE 1
BOTTOM OUTLET



STYLE 2
SIDE OUTLET TOP



STYLE 2B
SIDE OUTLET
BOTTOM

SIZE	PIPE SIZE IN NPT	A	B	C	D	E	F	SIZE	PIPE SIZE IN NPT	A	B	C	D	E	F
4-6	.075	10.3	4.5	6	3.75	15.3	5.6	4-12	.075	16.3	4.5	12	3.75	22.1	5.6
	1.00	10.5	4.5	6	3.75	15.5	5.7		1.00	16.5	4.5	12	3.75	22.2	5.7
15	1.25	10.9	4.5	6	3.75	15.7	5.9	25	1.25	16.9	4.5	12	3.75	22.6	5.9
	1.50	11.2	4.5	6	3.75	16.1	6.1		1.50	17.2	4.5	12	3.75	23.3	6.1
GPM	2.00	11.6	4.8	6	3.75	17	6.3	GPM	2.00	17.6	4.8	12	3.75	23.7	6.3

> STANDARD FEATURES

- * EYE BOLT COVER
- * 304 STAINLESS BASKET
- * BUNA SEAL
- * 1/4" NPT GAUGE PORT
- * ADJUSTABLE C.S. LEGS

> OPTIONS

- * 316 STAINLESS BASKET
- * PERFORATION @ MESH SIZES
- * DP PORTS
- * O-RING SEAL MATERIALS
- * 304,316 ADJUSTABLE LEGS
- * STYLE 3 90 ELBOW
- * FLANGE CONNECTIONS

ATTACHMENT F

Ecologix AHP-55 Vessels



Ecologix Environmental Systems, LLC

5100 Old Ellis Point
Roswell, GA 30076

Toll Free: 888-326-2020

Tel: 678-514-2100

Fax: 678-514-2106

Email: Info@EcologixSystems.com Website: www.EcologixSystems.com

AHP-55 Backwashing Procedures

Please record the inlet pressure on the units at startup. This will help you understand whether your units are becoming clogged later on. Typical back pressure on the units is 1 to 15 psi at first, depending on length of discharge hose after the units and flow rate.

When flow thru the units is reduced and the pressure on the lead unit is higher than at start, reverse the inlet and outlet water hoses for a few moments and run the discharge water into a holding tank. If pressure drops quickly and muddy water is present, consider a full backwash of the unit.

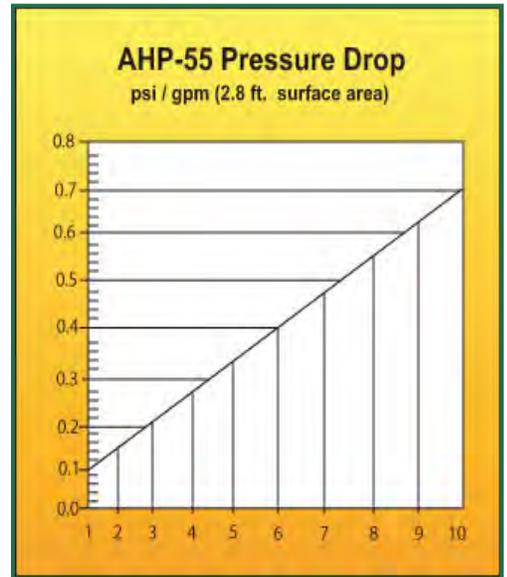
To perform a full backwash of the unit, it is best to run clean water into the outlet of the unit to avoid fouling the internals and contaminating the clean side of the media. Run clean water through the discharge side of the filter and empty the water from the inlet into a separate holding tank. Once water runs clear, go back to normal running setup. Allow the holding tank to settle for a day or two and pump the clarified water back into the primary frac tank for treatment. Never run backwash water into another unit. That will only foul the second unit.

If the backwash procedure did not improve flow or lower pressure, it may be necessary to replace the media.

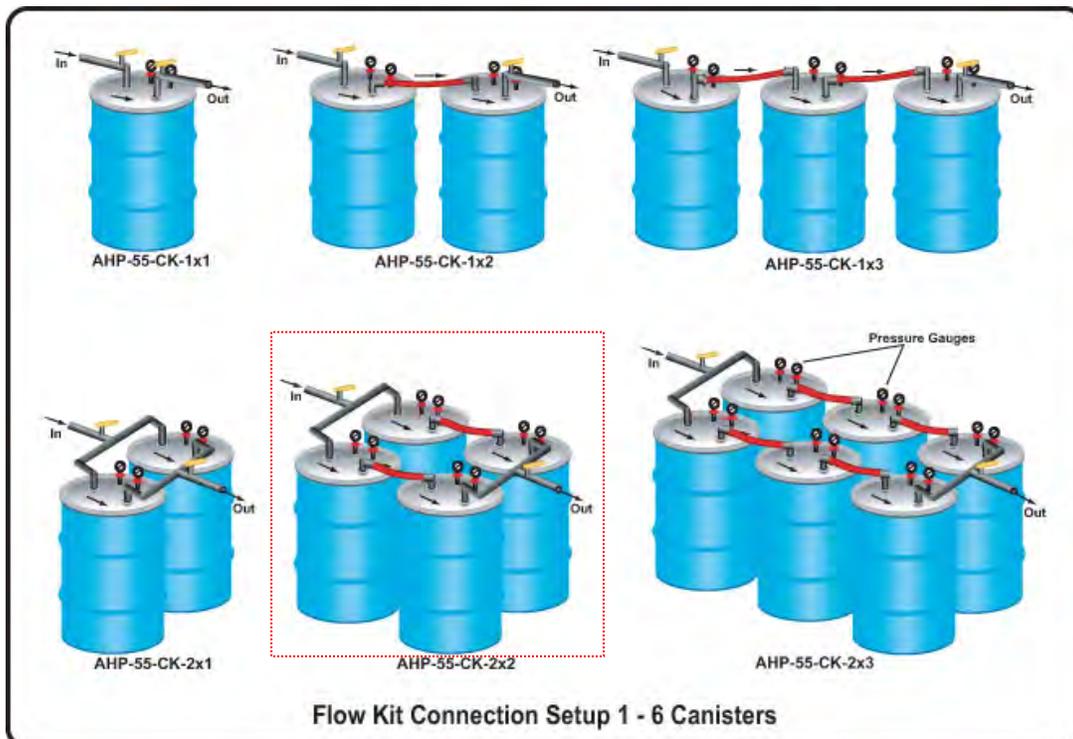
◀ AHP-55 CK 2X2 LIQUID FILTRATION VESSELS ▶

The AHP-55 Series Liquid Phase Vessels - Will not bulge, leak or rust apart. The top is made of heavy gauge domed steel and powder coated for durability. The interior has dual liners and a heavy domed internal bottom. Each has a built in 30 psi pressure relief valve, influent and effluent sample and pressure ports. Inlet and outlet on top. All canisters are pressure tested before shipping.

Sample Pressure Kit: Each kit comes with two (2) 1/4" PVC valves, tees and pressure gauges (0-60 psi). Comes pre-assembled and threads directly into the ports on the AHP-55 top. Simplifies ability to check pressure drop across the carbon and to get convenient influent and effluent water samples.



AHP-55 Connection Kit: Sold pre-assembled. Allows user to easily connect AHP-55's in series and in parallel. Connections are 1" female cam lock in and out. Allows easy switch of flow direction for occasional backwashing.



Phuc, the connection set up design that we recommend for you is AHP-55-CK-2x2



AHP-55 Instructions

Installation: Fill vessel at a rate of 1 to 2 gallons per minute through the outlet port to force trapped air out inlet of vessel. Allow vessel to stand 24 hours with inlet port open to permit de-gassing of carbon bed. Add additional water to completely fill vessel before placing in service. During initial startup, recycle water to remove carbon fines. Do this until water runs clear.

Operation: The granular activated carbon in this vessel will adsorb impurities from the water flow. Removal efficiency is reduced as flow rates are increased. The recommended maximum flow rate is 10 gallons per minute, however some impurities may require less flow to increase carbon contact time. As the carbon becomes saturated, some impurities will begin to pass through. To extend the useful life of the vessel it is recommended that two vessels be plumbed in series. Replace the first vessel when influent and effluent concentrations in the first vessel are equal. Move the second vessel to the first position and place the new vessel last.

Pressure Relief Valve: Lift the pressure release valve from time to time to release any built up gasses. The relief port should be plumbed into an upstream source to prevent uncontrolled discharge of impure liquid should pressures exceed 30 psig.

Drain Vessel: (Method 1): Using a shop vacuum, hold vacuum **hose tight to 2" discharge** opening and draw out water. (Method 2): Remove 2" bung from bottom of drum and slice 2 or 3 clean cuts through both liners with a sharp knife. Avoid punching holes in liners. Several clean slices will allow water to seep out but retain the carbon granules. Allow to drain 24 hours before shipping.

Caution: 1) Do not exceed 30 psig operating pressure. All air must be purged from vessel to prevent storage of energy from the compression of gas 2) Activated carbon has been known to react adversely with some contaminants. Test carbon before if affects are unknown. 3) Pre-filter for suspended solids should be used to prevent particulate fouling of carbon bed. 4) PH of water may be elevated during startup. Water may require neutralization until effluent meets influent values

Warranty: This product is designed to remove organic impurities from water. Due to the number of hidden variables in water there is no certainty of its capacity. Seller warrants that the product is free from defects such as leaks from seals. Many of the components in this product have been or may have been recycled. Seller will not be liable for loss or damage to property or any incidental or consequential loss or expense from property damage due directly or indirectly from the use of the product.

◀ FILL FOR 2ND AHP-55 IN EACH SET: CARBON FOR LIQUID PHASE ▶

ACTIVATED CARBON DATA SHEET																																						
Article	LGAC-8x30	Mesh Conversion Table																																				
Type	Granular Virgin Coal Base Activated Carbon for Liquid																																					
Description	<p>LGAC-8x30 is a granular activated carbon made especially for use in a liquid phase applications. Its particle size and pore structure has been specifically designed to provide the best adsorption of impurities from liquid steam with the least flow resistance and pressure drop. The resulting product is characterized by high internal surface area and contains a broad pore size distribution. The granular activated carbon is abrasion resistant and can be used in either conventional fixed or pulse bed adsorption applications. The hardness of these products allows repetitive custom reactivation cycles to avoid the high cost of carbon disposal. Typical applications include wastewater treatment, groundwater remediation, chemical purification, food grade applications, pharmaceutical, and potable water treatment.</p> <p>This product is well suited for decolorizing and removing odors causing impurities as well as adsorption of trace contaminates.</p> <p>LGAC-8x30 is processed from selected seams of bituminous coal with steam at high temperature. Acid washed GAC is available.</p>																																					
Typical Parameters	<table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 60%;">Iodine value</td> <td style="width: 20%; text-align: center;">900-1000</td> <td style="width: 20%; text-align: center;">ASTM-D-4607</td> </tr> <tr> <td>Apparent density</td> <td style="text-align: center;">0.42 - 0.47</td> <td style="text-align: center;">ASTM-D-2854</td> </tr> <tr> <td>Moisture as packed</td> <td style="text-align: center;">3%</td> <td style="text-align: center;">ASTM-D-2867</td> </tr> <tr> <td>Ash</td> <td style="text-align: center;">12%</td> <td style="text-align: center;">ASTM-D-2866</td> </tr> <tr> <td>Hardness (Ball pan)</td> <td style="text-align: center;">90</td> <td></td> </tr> <tr> <td>Surface Area</td> <td style="text-align: center;">950-1050</td> <td style="text-align: center;">BET N2</td> </tr> <tr> <td>Ignition Temp.</td> <td style="text-align: center;">400 C</td> <td style="text-align: center;">ASTM-D-3466</td> </tr> <tr> <td>Molasses Number</td> <td style="text-align: center;">200</td> <td></td> </tr> <tr> <td>Abrasion Number (Ro-Tap) min</td> <td style="text-align: center;">75</td> <td></td> </tr> <tr> <td>Mean Particle Diameter (mm)</td> <td style="text-align: center;">1.5-1.7</td> <td></td> </tr> <tr> <td>Backwashed & Drained Density (g/ml.)</td> <td style="text-align: center;">.43</td> <td></td> </tr> <tr> <td>Effective Size (mm)</td> <td style="text-align: center;">0.85</td> <td></td> </tr> </tbody> </table>		Iodine value	900-1000	ASTM-D-4607	Apparent density	0.42 - 0.47	ASTM-D-2854	Moisture as packed	3%	ASTM-D-2867	Ash	12%	ASTM-D-2866	Hardness (Ball pan)	90		Surface Area	950-1050	BET N2	Ignition Temp.	400 C	ASTM-D-3466	Molasses Number	200		Abrasion Number (Ro-Tap) min	75		Mean Particle Diameter (mm)	1.5-1.7		Backwashed & Drained Density (g/ml.)	.43		Effective Size (mm)	0.85	
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OrganoClay Products / MCM 830P

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→ Applications

- Automotive
- Biodiesel
- Dairy Industry
- Industrial Wastewater
- Food Processing Industry
- Iron Removal
- Latex Removal
- Metals Treatment
- Mining Industry
- Municipal Wastewater
- Odor Control
- Petrochemical Industry
- Poultry Industry

→ Products

- Activated Carbon
- Bag Filtration
- Biological Treatment
- Chemicals (Specialty)
- Clarifiers
- Controls
- Dissolved Air Flotation
- Dewatering
- Evaporators
- Membrane Filtration
- Microbial Bacteria
- Oil/Water Separators
- Ozone
- Pressure Filtration
- Screens
- Separators/Strainers
- Tanks

Facts About Ecologix MCM-830P Pure OrganoClay

- MCM-830P is made from calcined palygorskite clay. Unlike the flake-like crystals of Na-bentonite, palygorskite's needle-shaped crystalline structure is inert and nonswelling (this is also the difference between "clumping" and "non-clumping" kitty litters).
- MCM-830P safe pH operating range is 4-11. Waters with a pH out of range may deteriorate the clay.
- MCM-830P is safe at temperatures up to 175 F. Temperatures above this may deteriorate the clay.
- MCM-830P A 5-micron filter must be used ahead of MCM-830P to prevent solids from plugging the media bed.
- MCM-830P OrganoClay is 40% heavier in weight than activated carbon
- OrganoClay weighs 42 lbs. per cubic foot of media / Activated Carbon weighs 28 lbs. per cubic foot of media

Mesh Conversion Table | Activated Carbon

Ecologix OrganoClay - MCM-830P is a modified clay mineral designed for use as a filter media in process and wastewater treatment. The product effectively removes a wide range of hydrocarbons and trace amounts of heavy metals from water. Unlike competitive filter media, Ecologix OrganoClay - MCM-830P does not swell or blind when sorbing contaminants, so it need not be blended with anthracite filler.

The main difference between Ecologix OrganoClay - MCM-830P and other organoclays is that our media is 100% non-swelling modified clay and does not require blending with anthracite for porosity in a filter bed. This means that filter beds typically run 2-3x longer than filters using competitive (30/70 and 40/60 - clay/anthracite blends). In addition, because Ecologix OrganoClay - MCM-830P has a greater amount of "actives," it may also remove contaminants present at lower levels better than competitive medias.

Properties	
Appearance	Gray to Tan Granules
Specific Gravity	2.0 - 2.2
Bulk Density	42 - 46 lbs/ft cubed
Granule Size	8/30 Mesh (U.S. Sieve)
Contact Time	2 - 4 minutes (EBCT 3.3 - 6.6 min. 0
Void Volume	35% - 45%



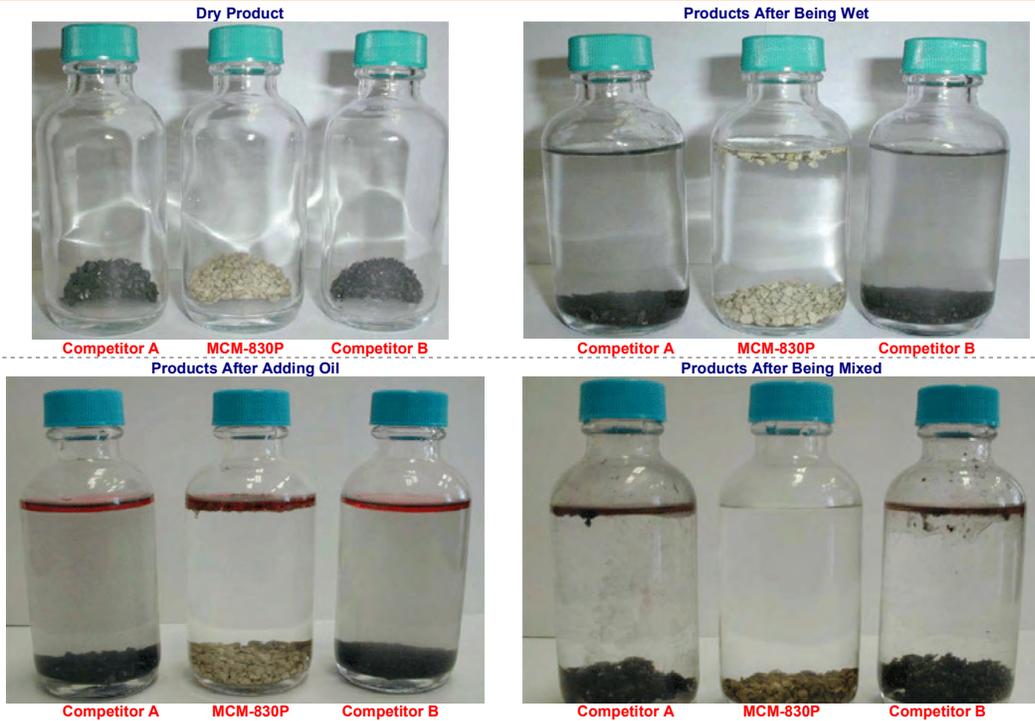
MCM-830P OrganoClay is a powerful, selective adsorbent that will recognize hydrocarbons and other pollutants - but not water. Designed for use in conventional liquid-phase filtration vessels, the granular modified clay attracts contaminants like a magnet and locks them in its molecular structure.

MCM-830P Modified Clay Media is produced in a proprietary process by combining sodium montmorillonite clay with a cationic quaternary amine salt, which replaces adsorbed sodium by ion exchange. Resulting clay surfaces become organophilic.

Extensive application use and field testing of MCM-830P Modified Clay Media technology, verified by independent laboratories, has demonstrated removal of a wide range of contaminants to discharge levels which meet NPDES and other regulatory requirements.

OrganoClay - A cost saving filtration media: When used alone, OrganoClay removes oil at 700% the rate of activated carbon and will reduce your operating costs by 50% or more. When used as a pre-treatment for activated carbon in applications involving oil and grease removal, OrganoClay removes the oil and grease effectively, allowing the activated carbon to remove the soluble organic compounds more efficiently.

Why OrganoClay is the best - Product Comparison



Observations

Although this test does not exactly simulate large-scale column operation of organoclays, the sorption characteristics of the various products can be seen. Ecologix OrganoClay - MCM-830P clearly outperforms the competitive products by quickly and efficiently removing nearly all of the paraffin oil from the water.

Ecologix OrganoClay - MCM-830P may be applied as a stand-alone filter media, to post-treat the effluent of oil-water separators, DAFs, clarifiers, and sand filters, or to pretreat the influent of GAC filters, reverse osmosis units, and ultra filtration devices. When properly applied, the Ecologix OrganoClay - MCM-830P is versatile, efficient, and cost-effective.

This advantage is due to the fact that Ecologix OrganoClay - MCM-830P is a nonswelling 100% active modified media, rather than a 30-40% clay product that must be blended with anthracite for porosity. This nonswelling characteristic also means that spent Ecologix OrganoClay - MCM-830P does not become "mushy" and is easily handled for disposal. You use OrganoClay as a pre-polisher for activated carbon to remove traces of oil from water, you will not only get superior results, but superior savings. OrganoClay is approved by the National Defense Department.

OrganoClay is a cost-saving filtration media -

When used alone, OrganoClay removes oil at 700% the rate of activated carbon and will reduce your operating costs by 50% or more. When used as a pre-treatment for activated carbon in applications involving oil and grease removal, OrganoClay removes the oil and grease effectively, allowing the activated carbon to remove the soluble organic compounds more efficiently.

OrganoClay increases the efficiency of the treatment process -

The quarternary amine-treated clay pellets have the ability to capture 50 - 60% of their weight in oil, grease and other low solubility organic compounds. Used upstream from activated carbon or downstream of other oil removal processes, OrganoClay optimizes the overall system performance and reduces costs.

Stand Alone:

OrganoClay outperforms anthracite, GAC, and all other filter media technologies in stand-alone applications for the removal of higher molecular weight hydrocarbons.

Post Treatment:

OrganoClay may be applied downstream of oil/water separators, DAF systems, clarifiers, sand filters, and other physical/chemical separation systems.

Application

OrganoClay is designed for column operation. The media should be placed in appropriately sized fluid contactor vessels in the same manner as granular activated carbon (GAC). OrganoClay needs to be wetted and deaerated with clean water for a minimum of 1 hour prior to the introduction of contaminants in order to prevent fluid channeling within the media bed.

Pretreatment:

OrganoClay may be used to pretreat the influent of GAC filters, reverse osmosis units, ultra filtration units, and other related systems where less soluble, higher molecular weight hydrocarbons tend to cause plugging, fouling, and equipment contamination.

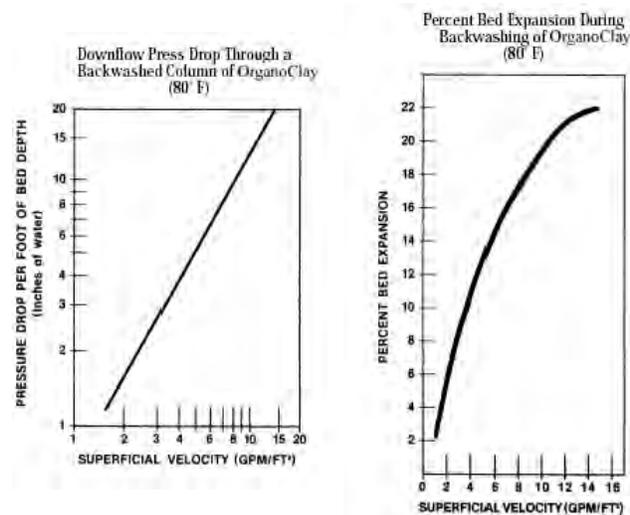
Dosage

The amount of OrganoClay required will vary depending on contaminant concentration and type, contact time, and fluid temperature. Generally, contaminants with lower concentrations and solubilities, longer contact times, and moderate fluid temperatures are preferred. Ecologix OrganoClay - EOC85 will typically absorb 40-70% of its own weight in hydrocarbons, dependent upon the conditions described above.

Storage and Handling

Store in a dry place. Avoid extreme temperatures. Avoid breathing dust. If clothing becomes dusty, launder before using.

Backwashing and Backwash



Product Specifications

Bulk Density:	46 lbs./cu.ft.
Specific Gravity:	1.5-2.5
pH Range:	2-12
Temperature Range:	33-180°F
Flash Point:	+400°F
Contact Time:	3 minutes actual retention time 9 minutes EBCT (at 80% fill)

Typical Usage Recommendations

Typical Applications:

- Removal of Oil & Grease
- insoluble hydrocarbons from wastewater or ethylene glycols

Waste Constituents Treatment Test Results: View test result sheet

Material Safety Data Sheet: View MSDS sheet

Hydrocarbon Removal with Modified Clay Media (OrganoClay)

MCM-830P completely removes free hydrocarbons from wastewater and also removes dissolved hydrocarbons including benzene, toluene, ethylbenzene, and xylene (BTEX). When used in conjunction with a polishing stage of granular activated carbon, Modified Clay Media removes dissolved and free hydrocarbons to levels well below current water quality standards.

Our MCM-830P OrganoClay product can be used to effectively remove oil and other hydrocarbons from water where traditional oil-water separators have had limited success. The product does not absorb hydrocarbons, but rather adsorbs them, which leaves no byproduct from the process. In the adsorption process, the quaternary amines create organic pillars between the clay platelets that increase the interlamellar distance and facilitate the formation of a hydrocarbon partition.

Water Treatment

When used for water treatment, organoclay is commonly utilized in the upstream sector of the petroleum industry for removing hydrocarbons from refinery process water, but is rarely used in the production of petroleum. Many other industries also use organoclay, including shipping and dockside servicing, car washes, and other businesses that deal with an oily wastewater stream. OrganoClays have also been tested for treating ground and surface water for other organic chemicals such as PCBs and pesticides.

Field testing and project implementation have consistently revealed that the combination of MCM-830P and granular activated carbon effectively removed hydrocarbons from produced water. Treated in field testing revealed specific findings:

- Reduces Total Petroleum Hydrocarbons to non-detectable levels. Sampling reveals TPH below detectable limits after adsorption by MCM-830P.
- Reduces Oil and Grease to non-detectable levels. Samples show Oil and Grease below detectable limits after adsorption by MCM-830P alone.
- Reduced soluble hydrocarbons Benzene, Ethylbenzene, Toluene, and Xylene to barely detectable levels. In samples BTEX was barely detectable after adsorption by MCM-830P alone. BTEX was below detectable limits after the combination of MCM-830P and granular activated carbon.

In simple terms, MCM-830P eliminated hydrocarbon contamination from produced water during the test. Other testing has shown that similar results are consistent in large-scale commercial applications.

Effective Water Treatment with Minimal Cost

Other laboratory testing of spent MCM-830P has shown that BTEX and other volatile hydrocarbons are adsorbed tightly enough for the spent product to pass the EPA's Toxicity Characteristic Leachate Procedure (TCLP) test and be disposed as a non-hazardous waste. The TCLP is used to identify the presence or absence of toxic chemicals that might be able to leach into groundwater after disposal. Being classified as a non-hazardous waste may allow the spent product to be landfilled, land farmed, or otherwise disposed in an economical and ecologically proper manner.



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CASE HISTORY # 15.3 - MCM-830P

BACKGROUND

An aircraft component manufacturer was using a competitive organoclay followed by GAC to remove oils and aromatic hydrocarbons from its waste stream. A test was conducted to see if MCM-830P would remove contaminants as efficiently, extend the organoclay and carbon filter service lives, and be more easily handled during changeouts due to its non-swelling nature.

RESULTS

Contaminant	Before (ppb)	After (ppb)	% Reduction	EPA Method
TPH	24413	1383	94.33	8015M
Acenaphthene	175	non-detect	99.99	8270C
Anthracene	677	non-detect	99.99	8270C
Dibenzofuran	28	non-detect	99.99	8270C
Fluorene	366	non-detect	99.99	8270C
Naphthalene	434	non-detect	99.99	8270C
Pyrene	61	non-detect	99.99	8270C

CONCLUSIONS

- MCM-830P removed aliphatic and aromatic hydrocarbons with equal or greater efficiency than the competitive product.
- Initial breakthrough of aromatic components using the competitive clay indicates that MCM-830P has a greater sorption capacity and resultant service life.
- Upon completion of the test, inspection of the two spent medias revealed that MCM-830P remains flowable and is easily handled for disposal.

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Product name	MCM-830P	HEALTH CODES
Product code	MCM-830P	
Company name	Ecologix Environmental Systems, LLC	Health 1
Company address	5100 Old Ellis Point, Roswell, GA 30075	Flammability 0
Company web site	www.EcologixSystems.com	Reactivity 0
Emergency phone	678-514-2100	Protection 8
Information phone	888-326-2020	

SECTION 2 - HAZARDOUS INGREDIENTS

COMPONENTS	CAS #	% BYWT	OSHA PEL	AGC 1H TWA	SARA TITLE III	RPT QTY
PNOC	N/A	100	5 mg/m ²	5 mg/m ²		

SECTION 3 - HAZARD IDENTIFICATION

INHALATION	Inhalation may cause inflamaiton of muccus membranes
EYES	May cause pain, reddening, and swelling of the cornias
SKIN	Remove contaminated clothing and footwear. Wash thoroughly with water and do not reuse
INGESTION	There is no data available regarding ingestion. As with most chemicals it may cause nausia

SECTION 4 - FIRST AID MEASURES

INHALATION	Immediately remove individual from contaminated area, get immediate medical attention.
EYES	Immediately flush eyes with plenty of cool water for atleast 15 minutes. Keep eyelids apart and keep maximum contact with cool water, get immediate medical attention.
SKIN	Remove contaminated clothing and footwear. Wash thoroughly with water and do not reuse product until cleared. If user is able to swallow quickly have them drink water or milk to dillute.
INGESTION	Do not give any liquid by mouth if the are unconsciencous or having convulsions. Induce vomitting only if advised by a physician.

SECTION 5 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	212 F	Flammable limits	N/A
EXTINGUISHING MEDIA	Use water spray, dry chemicals or fire extinguisher. Use water spray to keep the exposed containers cool. If product ignites use water spray to put out and disperse vapors.		
SPECIAL FIRE FIGHTING PROCEDURES	Do not direct a solid stream of water or foam in hot burning pools; this may cause to intensify heat. Use self-contained breathing aparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS	There are no known unusual fire and explosion hazards associated with this product. However, in a fire fighting scenario involving multiple chemicals, fire fighters should be aware of possible explosions and should attach the fire accordingly.		

ATTACHMENT G

Clean Effluent Pump

CT Series

High Pressure Centrifugal Pumps
 $\frac{1}{2}$ - $2\frac{1}{2}$ HP
 Heads to 140 Feet
 Capacities to 95 GPM



MYERS CT SERIES LINE OF HIGH PRESSURE CENTRIFUGAL PUMPS PROVIDES QUALITY AT A COMPETITIVE PRICE. The complete line of $\frac{1}{2}$ to $2\frac{1}{2}$ HP units provide strong pressures up to 140 feet and flows up to 95 gpm.

The rugged cast iron body construction is available with either a corrosion resistant composite or brass impeller. The brass impeller unit is equipped with a high temperature, viton seal for more demanding applications. The heavy duty motor features a double ball bearing, 50° C ambient, dual voltage design for dependable service. The compact, back pullout design provides easy installation and serviceability.

The quality features of the CT series will provide dependable service for a wide variety of applications.

SPECIFICATIONS

HP	Catalog No.		Pipe Tapping Sizes		Motor Voltage	Phase	Approx. Wt. Lbs.
	Composite Impeller	Brass Impeller	Suction (NPT)	Discharge (NPT)			
$\frac{1}{2}$	CT05	CT05B	1 $\frac{1}{4}$ "	1"	115/230	1	30
	CT053	CT05B3	1 $\frac{1}{4}$ "	1"	208/230/460	3	30
$\frac{3}{4}$	CT07	CT07B	1 $\frac{1}{2}$ "	1"	115/230	1	32
	CT073	CT07B3	1 $\frac{1}{2}$ "	1"	208/230/460	3	32
1	CT10	CT10B	1 $\frac{1}{2}$ "	1"	115/230	1	35
	CT103	CT10B3	1 $\frac{1}{2}$ "	1"	208/230/460	3	35
1 $\frac{1}{2}$	CT15	CT15B	1 $\frac{1}{2}$ "	1"	115/230	1	40
	CT153	CT15B3	1 $\frac{1}{2}$ "	1"	208/230/460	3	40
2	CT20	CT20B	1 $\frac{1}{2}$ "	1 $\frac{1}{4}$ "	115/230	1	57
	CT203	CT20B3	1 $\frac{1}{2}$ "	1 $\frac{1}{4}$ "	208/230/460	3	57
2 $\frac{1}{2}$	CT25	CT25B	2"	1 $\frac{1}{2}$ "	115/230	1	62
	CT253	CT25B3	2"	1 $\frac{1}{2}$ "	208/230/460	3	62

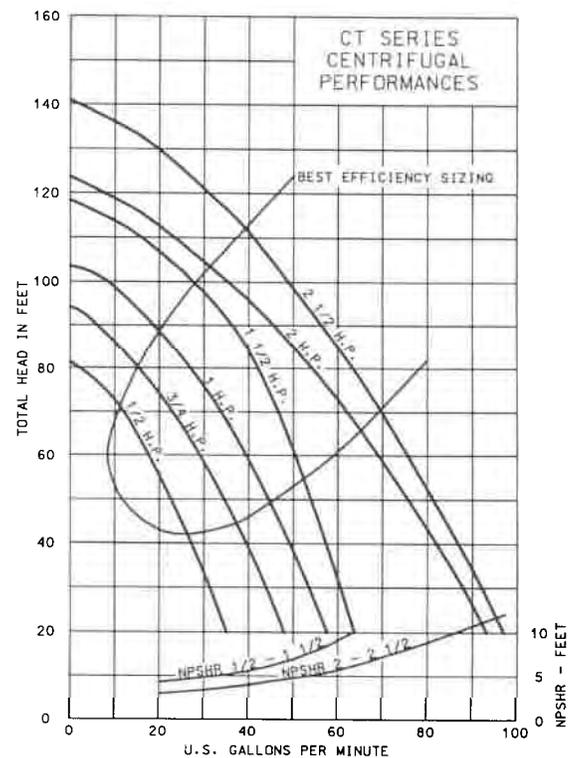
ADVANTAGES BY DESIGN

- Heavy duty cast iron construction.
- Back pull-out design.
- Dependable double ball bearing motor
- Continuous duty rating motor.
- Choice of brass or composite impeller.
- Brass impeller pumps rated 212° F.
- Composite impeller pumps rated 140° F.
- Maximum working pressure of 125 psi.
- CSA listed.

Applications

- Booster service
- Irrigation
- Circulating
- Cooling towers
- Air conditioning
- Liquid transfer
- Sprinkling systems
- General industrial service

PUMP PERFORMANCE



WHERE INNOVATION MEETS TRADITION

Myers[®]

Pentair Pump Group

CT Series

High Pressure Centrifugal Pumps

1/2 - 2 1/2 HP

Heads to 140 Feet

Capacities to 95 GPM

1. MOTOR

- NEMA standard
- Double ball bearing
- Open drip proof
- 60 Hz, 3450 rpm
- Stainless steel shaft
- Single phase with built-in overload protection
- Three phase require overload protection in starter unit
- Non-overloading
- Continuous duty
- Strong capacitor start design

2. SEAL PLATE

- Heavy duty cast iron for dependable service and long life

3. IMPELLER

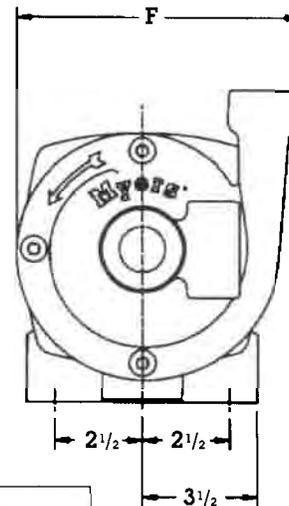
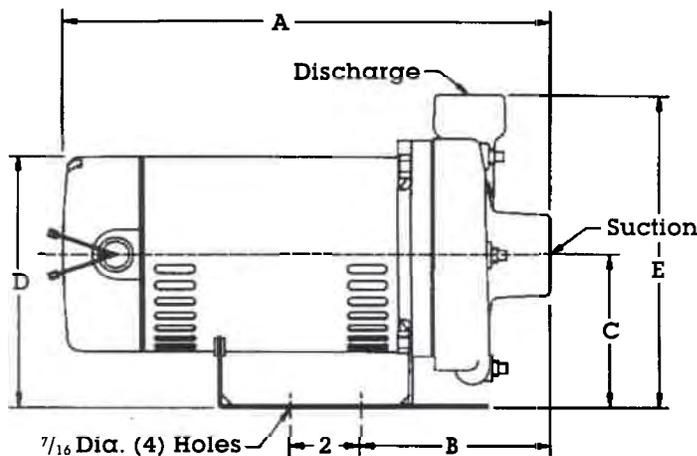
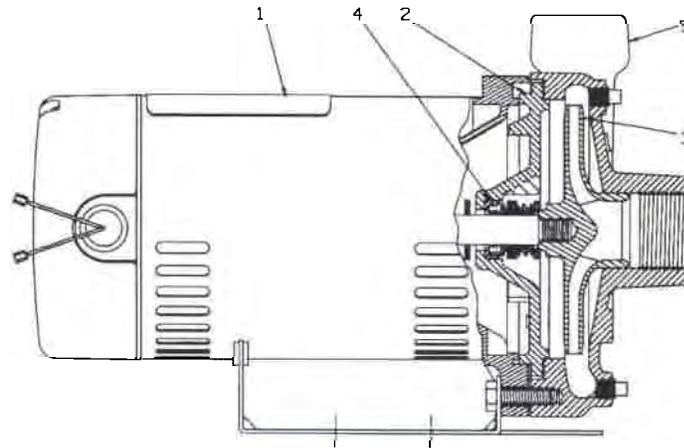
- Reinforced composite for applications to 140° F
- Threaded SST insert on composite impellers
- Brass for applications to 212° F
- Enclosed design for high efficiencies
- Balanced for smooth operation

4. MECHANICAL SEAL

- Standard carbon/ceramic faces, Buna elastomers, 300 series SST components (standard for pumps with composite impellers)
- High temperature carbon/ceramic faces, viton elastomers, 300 series SST components (standard for pumps with brass impellers)

5. CASING

- Heavy duty cast iron construction
- Back pull-out design
- Discharge can be rotated in four positions
- Tapped openings for priming, venting and draining.
- Vertical discharge standard



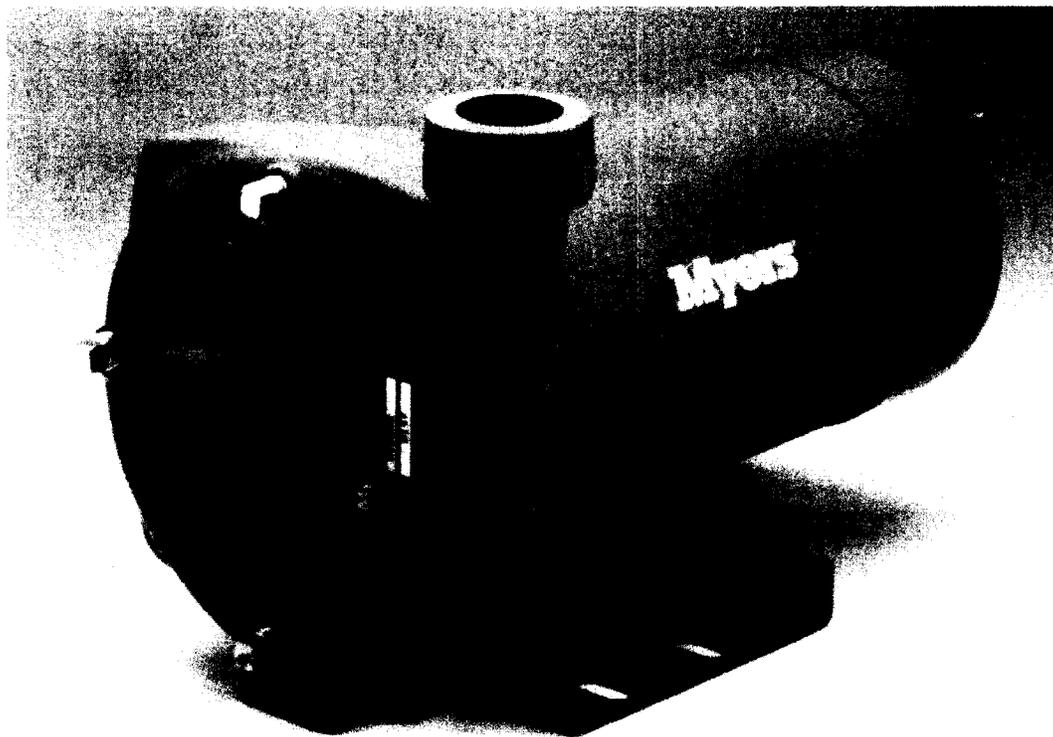
HP	Dimensions, inches							
	A	B	C	D	E	F	Suct.	Disch.
1/2	13 7/8	5 1/2	4 7/8	7 1/4	9	8	1 1/4	1
3/4	14 1/2	5 1/2	4 7/8	7 1/4	9	8	1 1/4	1
1	15 1/8	5 1/2	4 7/8	7 1/4	9	8	1 1/4	1
1 1/2	15 1/8	5 1/2	4 7/8	7 1/4	9	8	1 1/4	1
2	16 1/2	6 1/4	4 1/2	7 1/2	9 1/2	8 7/8	1 1/2	1 1/4
2 1/2	16 1/2	6 1/4	4 1/2	7 1/2	9 1/2	8 7/8	2	1 1/2



Myers®

Pentair Pump Group

Installation and Service Instructions Centri-Thrift Pumps CT Series



WARNING! IMPORTANT SAFETY INSTRUCTIONS! READ CAREFULLY BEFORE INSTALLATION



FAILURE TO FOLLOW THESE INSTRUCTIONS AND COMPLY WITH ALL CODES MAY CAUSE SERIOUS BODILY INJURY AND/OR PROPERTY DAMAGE

BE CERTAIN THE PUMP POWER SOURCE IS TURNED OFF AND DISCONNECTED.

▲ 2) All installation and electrical wiring must adhere to state and local codes. Check with appropriate community agencies, or contact your local electrical and pump professionals for help.

▲ 3) **CALL AN ELECTRICIAN WHEN IN DOUBT.** Pump must be connected to a separate electrical circuit directly from the entrance box. There must be an appropriately sized fuse or circuit breaker in this line. Tying into existing circuits may cause circuit overloading, blown fuses, tripped circuit breakers, or a burned up motor.

▲ 4) Do not connect pump to a power supply until the pump is grounded. For maximum safety, a ground fault interrupter should be used. **CAUTION: FAILURE TO GROUND THIS UNIT PROPERLY MAY RESULT IN SEVERE ELECTRICAL SHOCK.**

▲ 5) **WARNING:** Reduced risk of electric shock during operation of this pump requires the provision of acceptable grounding if the means of connection to the supply-connection box is other than grounded metal conduit, ground the motor back to the service by connecting a copper conductor, at least the size of the circuit conductors supplying the motor, to the ground screw provided within the wiring compartment of the motor.

▲ 6) The voltage and phase of the power supply must match the voltage and phase of the pump motor.

▲ 7) Do not use an extension cord.

▲ 8) Do not work on this pump or switch while the power is on.

▲ 9) Never operate a pump with a frayed or brittle power cord, and always protect it from sharp objects, hot surfaces, oil and chemicals. Avoid kinking the cord.

▲ 10) Never service a motor or power cord with wet hands or while standing in or near water or damp ground.

▲ 11) The three phase units must be wired by a qualified electrician, using an approved starter box and switching device.

▲ 12) Do not use this pump in or near a swimming pool, pond, lake or river.

▲ 13) Single phase motors are equipped with automatic resetting thermal protectors. The motor may restart unexpectedly causing the leads to energize or pump to turn. Three phase motors should be protected by proper, thermal and amperage protection. (Check local codes.)

▲ 14) Do not pump gasoline, chemicals, corrosives, or flammable liquids; they could ignite, explode, or damage the pump, causing injury and voiding the warranty.

▲ 15) Do not run this pump with the discharge completely closed this will create superheated water, which could damage the seal, and shorten the life of the motor. This superheated water could also cause severe burns.



▲ 16) The following may cause severe damage to the pump and void warranty. It could also result in personal injury:

- Running the pump dry.
- Failure to protect the pump from below freezing temperatures.
- Running the pump with the discharge completely closed.
- Pumping chemicals or corrosive liquids.

▲ 17) Never work on the pump or system without relieving the internal pressure.

▲ 18) Do not pump water above 120° Fahrenheit.

▲ 19) Never exceed the pressure rating of any system component.

INSTALLATION

PACKAGE CONTENTS - 1. Each pump is carefully tested and packaged at the factory.
2. The catalog lists all parts included with package. A packing list packed with pump, also lists contents.
3. Be sure all parts have been furnished and that nothing has been damaged in shipment.
4. **OPEN PACKAGES AND MAKE THIS CHECK BEFORE GOING ON JOB.**

PIPING - Pipes must line up and not be forced into position by unions. **Piping should be independently supported near the pump so that no strain will be placed on the pump casing.** Where any noise is objectionable, pump should be insulated from the piping with rubber connections. Always keep pipe size as large as possible and use a minimum of fittings to reduce friction losses.

SUCTION PIPING - Suction pipe should be direct and as short as possible. It should be at least one size larger than suction inlet tapping and should have a minimum of elbows and fittings. The piping should be laid out so that it slopes upward to pump without dips or high points so that air pockets are eliminated. The highest point in the suction piping should be the pump inlet except where liquid flows to the pump inlet under pressure. A foot valve must be used to keep pump primed. Where liquid flows to the pump, it may be desirable to use a check valve in the suction line or discharge line to keep pump primed.

To prevent air from being drawn into suction pipe due to a suction whirlpool, the foot valve should be submerged at least three feet below the low water level. The suction pipe must be tight and free of air leaks or pump will not operate properly.

DISCHARGE PIPING - Discharge piping should never be smaller than pump tapping and should preferably be one size larger. A gate valve should always be installed in discharge line for throttling if capacity is not correct. To protect the pump from water hammer and to prevent backflow, a check valve should be installed in the discharge line between the pump and gate valve.

ELECTRICAL CONNECTIONS - Be sure motor wiring is connected for voltage being used. Unit should be connected to a separate circuit, direct from main switch. A fused disconnect switch or circuit breaker must be used in this circuit. Wire of sufficient size should be used to keep voltage drop to a maximum of 5%. All motors, unless provided with built-in overload protection, must be protected with

an overload switch, either manual or magnetic. Single phase ½-2½ HP motors have built-in overload protection. **Never install a pump without proper overload protection.** When motor is mounted on a base plate or on slide rails for adjustment, flexible metallic conduit should be used to protect the motor leads.

PRIMING - The pump must be primed before starting. The pump casing and suction piping must be filled with water before starting motor. Remove vent plug in top of casing while pouring in priming water. A hand pump or ejector can be used for priming when desired. When water is poured into pump to prime, use care to remove all air before starting motor.

If pump does not start immediately, stop and reprime.

STARTING - It is good practice to close the discharge valve when starting the pump as it puts less starting load on the motor. When the pump is up to operating speed, open the discharge valve to obtain desired capacity or pressure. Do not allow the pump to run for long periods with the discharge valve tightly closed. If the pump runs for an extended period of time without liquid being discharged, the liquid in the pump case can get extremely hot.

ROTATION - The pump must run in direction of arrow on pump case. All single phase motors are single rotation and leave factory with proper rotation. Three phase motors may run either direction. If rotation is wrong when first starting motor, interchange any two line leads to change rotation.

STOPPING - Before stopping pump, close the discharge valve. This will prevent water hammer and is especially important on high head pumps.

FREEZING - Care should be taken to prevent the pump from freezing during cold weather. It may be necessary, when there is any possibility of this, to drain the pump casing when not in operation. Drain by removing the pipe plug in the bottom of the casing.

ROTARY SEAL - Centri-Thrift pumps are fitted only with a rotary seal. This seal is recommended for water free from abrasives. If liquid contains abrasives, the Centri-Thrift pump should not be used.

BEARINGS - The pump motor uses sealed ball bearings that are factory lubricated and require not further lubrication.

DISASSEMBLY INSTRUCTIONS

All pumping parts can be removed from case without disturbing the piping.

POWER SUPPLY - Open the power supply switch contacts and remove fuses. Disconnect the electrical wiring from the motor.

VOLUTE CASE

- (a) Drain pump case by removing drain plug.
- (b) Remove the cap screws securing volute case to pump bracket.
- (c) Pry volute case from seal plate with a screwdriver.

IMPELLER

- (a) Remove motor end cover.
- (b) Loosen clamp holding start capacitor and swing capacitor off to one side, do not disconnect wires.
- (c) Wrench flats are on the shaft just behind the centrifugal switch that is screwed into the end of the shaft. Do not remove this switch. A 7/16" open end wrench can then be used to hold the shaft from turning.
- (d) Grasp the impeller and turn counterclockwise (as viewed from the pump end).

SEAL

- (a) Remove the rotating part of the seal by pulling it off the shaft.
- (b) The stationary seat can be pressed from the seal plate.

ASSEMBLY INSTRUCTIONS

All pump parts should be cleaned thoroughly before being reassembled.

MOTOR

- (a) Assure that the rubber slinger is in place on the motor shaft.

SEAL

- (a) A new pump seal should always be used when rebuilding a pump.

- (b) Apply some light oil to the rubber which surrounds the ceramic stationary seat. Insert the seal seat into the seal plate using finger pressure to press firmly and squarely until it bottoms. Care must be taken to keep grease and dirt off face areas of the seal. Be sure the seal faces are not damaged during assembly (cracked, scratched, or chipped) or the seal will leak.
- (c) Position the seal plate into the motor flange. use care not to chip the stationary seal seat by hitting the motor shaft.
- (d) By hand, carefully press the rotating seal assembly onto the motor shaft. The smooth face of the carbon ring must contact the ceramic seat. The rubber ring must seal against the shaft.

IMPELLER

- (a) Hold the motor shaft with a 7/16" open end wrench.
- (b) Check that the rubber ring of the seal is positioned on the shaft.
- (c) Turn the impeller clockwise onto the shaft.
- (d) Replace the capacitor taking care not to pinch any wires and tighten capacitor clamp.
- (e) Replace motor end cover taking care not to pinch any wires.

VOLUTE

- (a) Assure that a new or good condition gasket is in place on the seal plate.
- (b) Carefully position the volute in alignment over the impeller and seal plate.
- (c) Assemble the components with four 3/8-16UNC cap screws. The bottom two cap screws must also pass through the bracket.

RESTARTING OPERATION

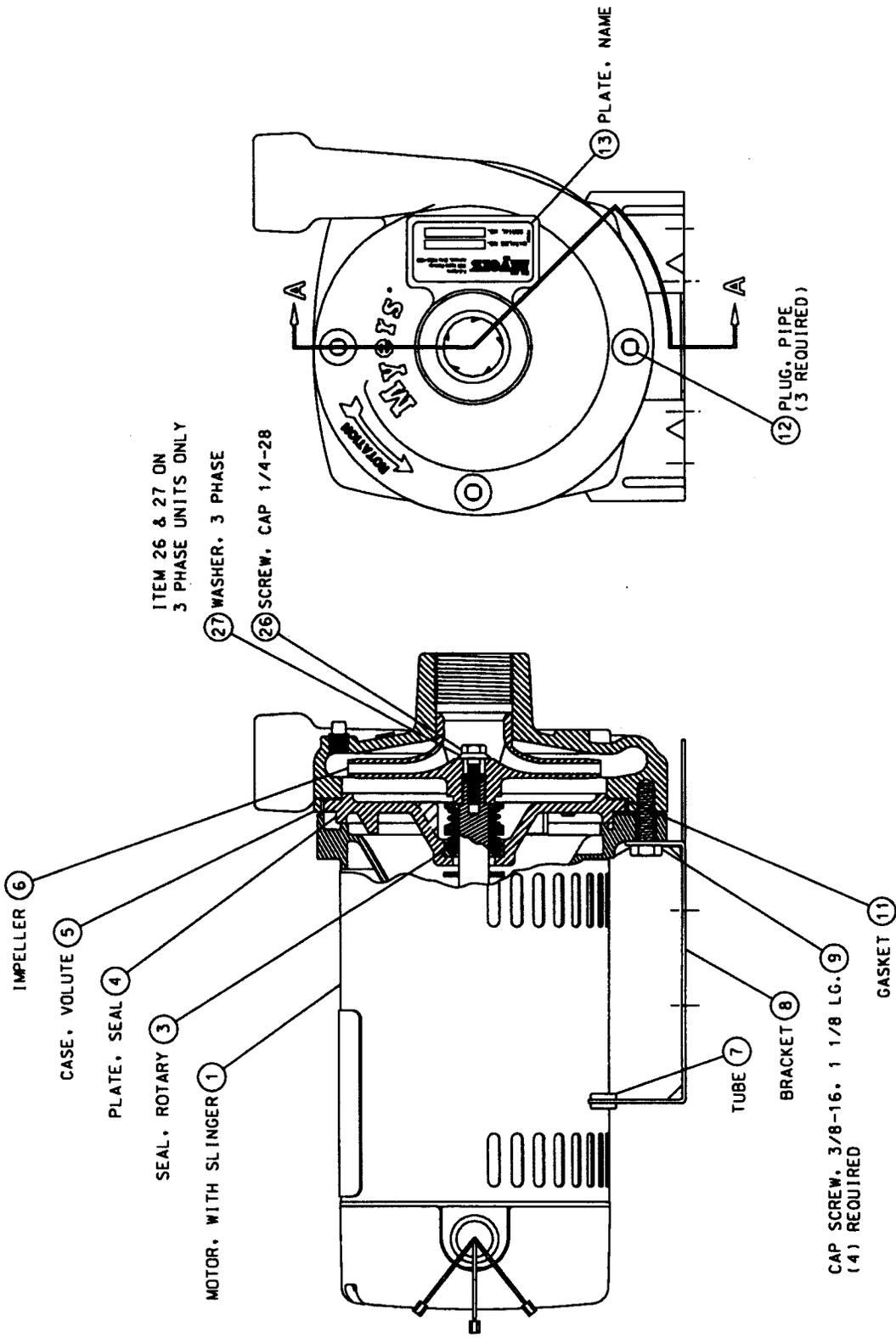
- (a) The pump must be primed before starting. The pump volute and suction piping must be filled with water before starting motor. A hand pump or ejector can be used for priming when desired.
- (b) Reconnect electric power.
- (c) After a few minutes of operation, check that there is no leakage from the pump or piping.

PARTS LIST
CENTRI-THRIFT CT SERIES
½, ¾, 1, 1½ HP

ITEM NO.	DESCRIPTION	QUANTITY REQUIRED	PART NUMBER
1	Motor		
	1/2 HP, 115/230V, 1 Phase	1	26452A000
	1/2 HP, 208-230/460V, 3 Phase	1	26452A001
	¾ HP, 115/230V, 1 Phase	1	26453A000
	¾ HP, 208-230/460V, 3 Phase	1	26453A001
	1 HP, 115/230V, 1 Phase	1	26454A000
	1 HP, 208-230/460V, 3 Phase	1	26454A001
	1-1/2 HP, 115/230V, 1 Phase	1	26455A000
	1-1/2 HP, 208-230/460V, 3 Phase	1	26455A001
3	Seal, Rotary 5/8 Shaft		
	Standard Seal with Polycarbonate Impeller	1	14525A010
	Hi-Temp Seal with Brass Impeller	1	21181A021
4	Plate, Seal - Cast Iron	1	26442C000
5	Case, Volute - Cast Iron		
	BSPP Threads	1	26443D000
	NPT Threads	1	26443D001
6	Impeller		
	Polycarbonate, 1/2 HP, 1 Phase	1	26441B003
	Polycarbonate, 1/2 HP, 3 Phase	1	26441B005
	Polycarbonate, ¾ HP, 1 Phase	1	26440B003
	Polycarbonate, ¾ HP, 3 Phase	1	26440B005
	Polycarbonate, 1 HP, 1 Phase	1	26439B007
	Polycarbonate, 1 HP, 3 Phase	1	26439B011
	Polycarbonate, 1-1/2 HP, 1 Phase	1	26439B004
	Polycarbonate, 1-1/2 HP, 3 Phase	1	26439B010
	Bronze, 1/2 HP, 1 Phase	1	26441B000
	Bronze, 1/2 HP, 3 Phase	1	26441B004
	Bronze, ¾ HP, 1 Phase	1	26440B000
	Bronze, ¾ HP, 3 Phase	1	26440B004
	Bronze, 1 HP, 1 Phase	1	26439B001
	Bronze, 1 HP, 3 Phase	1	26439B009
	Bronze, 1-1/2 HP, 1 Phase	1	26439B000
	Bronze, 1-1/2 HP, 3 Phase	1	26439B008
	7	Tube	1
8	Bracket	1	25383B002
9	Cap Screw, 3/8-16 UNC x 1 1/8 Lg.	4	19101A016
11	Gasket, 6-3/8 x 5-19/32 x 1/32 Vellumoid	1	05059A446
12	Plug, 1/8 NPT - Galvanized	3	05022A021
13	Plate, Name	1	17908A000
26	Cap Screw, 1/4-28 UNF x 7/8 Lg. (3 Phase)	1	19099A032
27	Washer, 11/16 O.D. Bronze (3 Phase)	1	10186A000

PARTS LIST
CENTRI-THRIFT CT SERIES
2 and 2½ HP

ITEM NO.	DESCRIPTION	QUANTITY REQUIRED	PART NUMBER
1	Motor		
	2 HP, 115/230V, 1 Phase	1	26489A000
	2 HP, 208-230/460V, 3 Phase	1	26489A001
	2-1/2 HP, 115/230V, 1 Phase	1	26490A000
	2-1/2 HP, 208-230/460V, 3 Phase	1	26490A001
3	Seal, Rotary 5/8 Shaft		
	Standard Seal with Polycarbonate Impeller	1	14525A010
	Hi-Temp Seal with Brass Impeller	1	21181A021
4	Plate, Seal - Cast Iron	1	26485D000
5	Case, Volute - Cast Iron		
	2 HP - BSPP Threads	1	26484D001
	2 HP - NPT Threads	1	26484D003
	2-1/2 HP - BSPP Threads	1	26484D000
	2-1/2 HP - NPT Threads	1	26484D002
6	Impeller		
	Polycarbonate, 2 HP, 1 Phase	1	26487C005
	Polycarbonate, 2 HP, 3 Phase	1	26487C009
	Polycarbonate, 2-1/2 HP, 1 Phase	1	26487C004
	Polycarbonate, 2-1/2 HP, 3 Phase	1	26487C008
	Bronze, 2 HP, 1 Phase	1	26487C001
	Bronze, 2 HP, 3 Phase	1	26487C007
	Bronze, 2-1/2 HP, 1 Phase	1	26487C000
Bronze, 2-1/2 HP, 3 Phase	1	26487C006	
7	Tube	1	26238A000
8	Bracket	1	26488C000
9	Cap Screw, 3/8-16 UNC x 1-1/8 Lg.	4	19101A016
11	Gasket, 6.58 x 6.13, Vellumoid	1	05059A447
12	Plug, 1/8 NPT - Galvanized	3	05022A021
13	Plate, Name	1	17908A000
26	Cap Screw, 1/4-28 UNF x 1-1/8 Lg. (3 Phase)	1	19099A031
27	Washer, 11/16 O.D. Bronze (3 Phase)	1	10186A000



SERVICE

TROUBLE SHOOTING GUIDE

A	B	C	D				
No water delivered							
Not enough water delivered							
Not enough pressure							
Pump runs for short while; then loses prime							
POSSIBLE CAUSE OF PROBLEM				D	C	B	A
1. Pump not properly primed; repeat priming operation							X
2. Discharge head too high. Check total head with gauge at pump inlet and discharge. (With no water, the gauge at discharge would show shut-off pressure.)						X	X
3. Excessive volume being discharged. Throttle discharge valve.					X		
4. Suction lift too high. Check with vacuum gauge. This should not exceed 15 feet.				X		X	X
5. Air leak in suction line. Check line under pressure to find leak.				X	X	X	X
6. Air pocket in suction line. Check line for proper slope.				X			X
7. Impeller or suction line plugged.					X	X	x
8. Impeller and volute case badly worn. Disassemble pump if clearance on diameter is over .030", replace worn impeller and worn volute case.					X	X	
9. Suction strainer plugged. Clean strainer.				X			
10. Impeller diameter too small for condition required.					X	X	
11. Seal leaking - seal is worn or seal face cocked. Replace with new seal and carefully follow directions.							

ATTACHMENT H

Oil Water Separators - General Information

OIL/WATER SEPARATORS

5.1 Introduction

The wastewater treatment exemption in §112.1(d)(6) excludes from SPCC requirements facilities or parts of facilities that are used exclusively for wastewater treatment, as long as they are not used to meet other requirements of 40 CFR part 112. This chapter clarifies the applicability of this exemption to oil/water separators (including equipment, vessels, and containers that are not specifically called “oil/water separators” but perform oil/water separation, such as water clarifiers at wastewater treatment plants).

The intended use of an oil/water separator determines whether the separator is subject to the SPCC regulations and, if so, what provisions are applicable. As outlined in Table 5-1 below, oil/water separators may be used for several different purposes: to treat wastewater, to meet secondary containment requirements of 40 CFR part 112, or as part of the oil production

process. Only oil/water separators used exclusively to treat wastewater and not used to satisfy any requirement of part 112 are exempt from all SPCC requirements. Oil/water separators used in oil production and to meet the secondary containment requirements of the rule are not exempt.

§112.1(d)

Except as provided in paragraph (f) of this section, this part does not apply to: ... (6) Any facility or part thereof used exclusively for wastewater treatment and not used to satisfy any requirement of this part. The production, recovery, or recycling of oil is not wastewater treatment for purposes of this paragraph.

Note: The above text is an excerpt of the SPCC rule. Refer to the full text of 40 CFR part 112.

Table 5-1. SPCC rule applicability for various uses of oil/water separators.

Wastewater Treatment	Secondary Containment	Oil Production
Separators are exempt from all SPCC requirements in accordance with §112.1(d)(6) and do not count toward facility storage capacity.	Separators that are used as part of a secondary containment system and are not intended for oil storage or use do not themselves require secondary containment, and do not count toward facility storage capacity. However, they are subject to the design specifications (e.g., capacity) for the secondary containment requirements with which they are designed to comply.	Separators that are bulk storage containers, subject to the provisions of §§112.9(c) or 112.11(b) and (d), are not exempt and count toward the facility storage capacity.

The remainder of this chapter is organized as follows:

- **Section 5.2** summarizes the provisions of the SPCC rule that apply to the three uses of oil/water separators identified above.
- **Section 5.3** discusses the use of an oil/water separator for wastewater treatment and the exemption for this use.
- **Section 5.4** addresses the use of an oil/water separator as secondary containment and the applicable SPCC requirements.
- **Section 5.5** discusses the use of an oil/water separator in oil production and the applicable SPCC requirements.
- **Section 5.6** describes required documentation for oil/water separators and the role of the EPA inspector in reviewing facilities with oil/water separators.

5.2 Overview of Provisions Applicable to Oil/Water Separators

Section 112.1(d)(6) addresses oil/water separators used for wastewater treatment. Facilities or equipment used exclusively for wastewater treatment, and which do not satisfy any requirements of the SPCC rule, are exempt from the SPCC rule requirements. These oil/water separators do not count toward facility storage capacity. Whether a wastewater treatment facility or part thereof is used exclusively for wastewater treatment or used to satisfy an SPCC requirement will often be a facility-specific determination based upon the activities carried out at the facility and upon its configuration.

Drainage systems that satisfy the secondary containment requirements of the SPCC rule may use oil/water separators to recover oil and return it to the facility (see Chapter 4 of this document for a description of secondary containment requirements). Examples of oil/water separators that are used to meet SPCC requirements include oil/water separators used to satisfy the secondary containment requirements of §§112.7(c), 112.7(h)(1), 112.8(c)(2), 112.8(c)(11), 112.12(c)(2), and/or 112.12(c)(11). Additionally, the drainage provisions in §§112.8(b) and 112.9(b) set forth design specifications for secondary containment at a facility. Oil/water separators may be used as part of a facility drainage system to meet the secondary containment requirements of the rule. Oil/water separators used to satisfy these rule requirements are subject to applicable secondary containment requirements, but they do not count toward storage capacity.

As stated in §112.1(d)(6), production, recovery, and recycling of oil are not considered wastewater treatment and, thus, are not eligible for the wastewater treatment exemption. For purposes of §112.1(d)(6), this means recovery and recycling of crude oil at facilities associated with, and downstream of, production facilities, such as saltwater disposal and injection

§112.9(c)(2)

Provide all tank battery, separation, and treating facility installations with a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. You must safely confine drainage from undiked areas in a catchment basin or holding pond.

Note: The above text is an excerpt of the SPCC rule. Refer to the full text of 40 CFR part 112.

facilities. Section 112.9(c)(2) includes requirements for oil/water separators (e.g., gun barrels, heater-treaters) used at onshore oil production facilities. This provision specifically identifies the secondary containment and drainage requirements for all tank battery, separation, and treating facility installations, including oil/water separators. Examples of oil/water separators associated with oil production, separation, and treatment include free water knock-outs, two- and three-phase separators, and gun barrels.

Sections 112.11(b) and (d) include the applicable provisions for oil/water separators located at offshore oil production facilities.

Figure 5-1 helps determine the use of an oil/water separator at SPCC-regulated facilities and identifies the corresponding rule requirements or exemptions based upon each use.

§112.11(b)

Use oil drainage collection equipment to prevent and control small oil discharges around pumps, glands, valves, flanges, expansion joints, hoses, drain lines, separators, treaters, tanks, and associated equipment. You must control and direct facility drains toward a central collection sump to prevent the facility from having a discharge as described in §112.1(b). Where drains and sumps are not practicable, you must remove oil contained in collection equipment as often as necessary to prevent overflow.

Note: The above text is an excerpt of the SPCC rule. Refer to the full text of 40 CFR part 112.

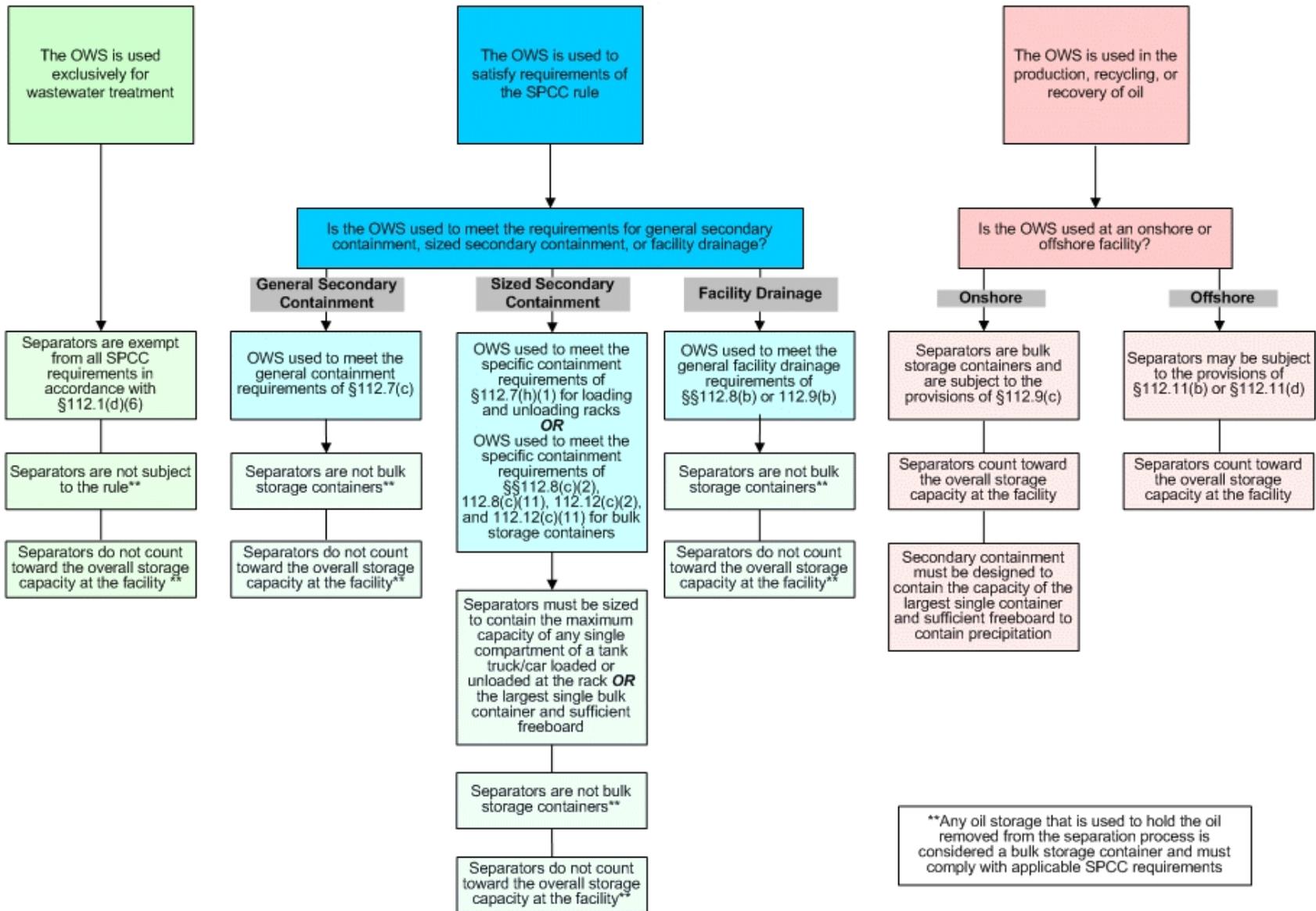
§112.11(d)

At facilities with areas where separators and treaters are equipped with dump valves which predominantly fail in the closed position and where pollution risk is high, specially equip the facility to prevent the discharge of oil. You must prevent the discharge of oil by:

- (1) Extending the flare line to a diked area if the separator is near shore;
- (2) Equipping the separator with a high liquid level sensor that will automatically shut in wells producing to the separator; or
- (3) Installing parallel redundant dump valves.

Note: The above text is an excerpt of the SPCC rule. Refer to the full text of 40 CFR part 112.

Figure 5-1. Applicable requirements for an oil/water separator.

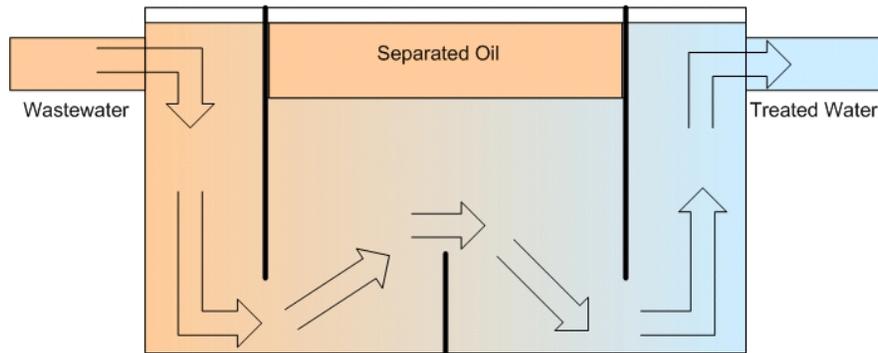


5.3 Oil/Water Separators Used in Wastewater Treatment

5.3.1 Description of Oil/Water Separator Use in Wastewater Treatment

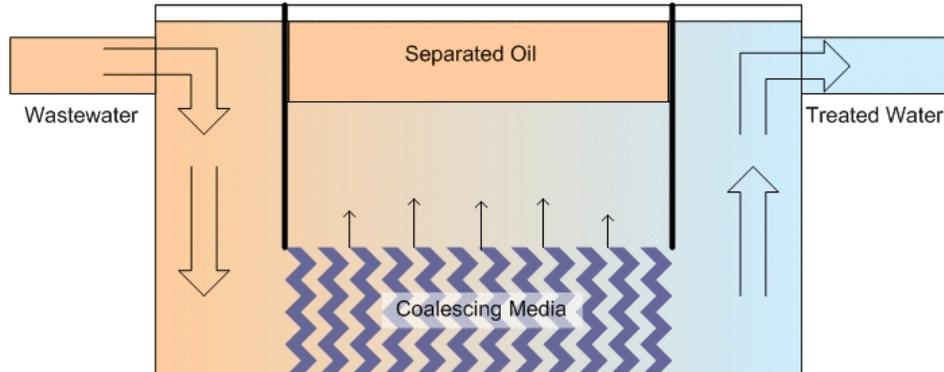
Oil/water separators used to pre-treat wastewater are usually of two kinds: standard gravity separators or enhanced gravity separators.¹ Standard gravity separators, as illustrated in Figure 5-2 (separator designs may vary), are liquid containment structures that provide sufficient hydraulic retention time to allow oil droplets to rise to the surface. The oil forms a separate layer that can then be removed by skimmers, pumps, or other methods. The wastewater outlet is located below the oil level so that water leaving the separator is free of the oil that accumulates at the top of the unit. The inlet is often fitted with diffusion baffles to reduce turbulent flow that might prevent effective separation of the oil and might re-suspend settled pollutants.

Figure 5-2. Standard gravity oil/water separator.



Enhanced gravity separators allow the separation of smaller oil droplets within confined spaces. These separators use a variety of coalescing media and small diameter cartridges that enhance laminar flow and separation of smaller oil droplets that accumulate on the separator surface for removal. Figure 5-3 shows coalescing plates in the middle compartment (separator designs may vary).

¹ Other types of separators include vortex separators, which combine gravity with centrifugal forces.

Figure 5-3. Enhanced gravity oil/water separator.

Oil/water separators are flow-through equipment in which wastewater enters the separator and treated water exits the separator on a continual basis. To be effective, the oil/water separator is sized appropriately in order for the unit to separate and contain the intended oil capacity, in addition to the flow-through wastewater quantity. Also, the design flow rate of the oil/water separator is carefully considered when specifying a wastewater treatment system, as a flow rate above the maximum rate of the separator will cause the discharge of accumulated oil and/or untreated wastewater. The specifications from oil/water separator manufacturers typically outline these and other design factors to consider, along with operation and maintenance requirements, to ensure that the oil/water separator is correctly constructed and operated for its intended use.

5.3.2 Applicability of the SPCC Rule to Oil/Water Separators Used for Wastewater Treatment

Section 112.1(d)(6) exempts “any facility or part thereof” that is used *exclusively* for wastewater treatment *and* is not used to meet any other requirement of the rule (excluding oil production, recovery, and recycling facilities). Certain components of wastewater treatment facilities, such as treatment systems at publicly owned treatment works (POTWs) and industrial wastewater treatment facilities treating oily wastewater, likely meet the two criteria for this exemption.

POTWs and other wastewater treatment facilities may have bulk storage containers and oil-filled equipment, as well as exempt oil/water separators. The capacity of the bulk storage containers and oil-filled equipment is counted to determine whether the facility is subject to the requirements of the SPCC rule. Only the oil/water separator capacity does not count toward the overall storage capacity of the facility. Thus, the presence of an oil/water separator at an otherwise regulated facility does not exempt the entire facility from the SPCC rule requirements. At wastewater treatment facilities, storage capacity to be counted includes bulk storage containers, hydraulic equipment associated with the treatment process, containers used to store oil that feed an emergency generator associated with wastewater treatment, and slop tanks or other containers used to store oil resulting from treatment. Any separate container used to store oil recovered by the

separation process or any other equipment or containers at a regulated facility that do not qualify for the wastewater treatment exemption are required to meet all applicable SPCC requirements (67 FR 47069).

Oil/water separators used exclusively for wastewater treatment are flow-through separators and are not engaged in a static process in an isolated container. For example, a bulk storage container containing an oil and water mixture, and from which water is drawn from the bottom, does not constitute wastewater treatment.

Examples of oil/water separators that may be considered wastewater treatment and may be eligible for the exemption of §112.1(d)(6) include:

- Oil/water separators at a wastewater treatment facility;
- Oil/water separators at an active groundwater remediation site;
- Grease traps that intercept and congeal oil and grease from liquid waste; and
- Oil/water separators in landfill leachate collection systems.

Oil/water separators exempted from the SPCC rule may, however, be subject to other federal, state, and local regulations. In addition, a separate container storing oil removed from an exempt separator is considered a bulk storage container and is subject to the SPCC rule requirements.

Many of these exempted wastewater treatment oil/water separators are within wastewater treatment facilities or parts thereof subject to the National Pollutant Discharge Elimination System (NPDES) requirements under section 402 of the Clean Water Act (CWA). NPDES (or an approved state permit program) ensures review and approval of the facility's wastewater treatment plans and specifications, operation/maintenance manuals and procedures, and requires a Storm Water Pollution Prevention Plan, which may include a Best Management Practice (BMP) Plan.

BMPs are additional conditions that may supplement effluent limitations in NPDES permits. In addition, other affected facilities need a BMP Plan for storm water runoff control under an NPDES permit. Under §402(a)(1) of CWA, BMPs may be imposed when the Administrator determines that such conditions are necessary to carry out the provisions of the Act.²

Additionally, some facilities may be subject to pretreatment standards promulgated under §307(b) of CWA. Pretreatment standards apply to "indirect discharges" that go first to a POTW via a collection system before being discharged to navigable waters, and they concern pollutants that pass through POTWs untreated or interfere with the operation of POTWs. The General Pretreatment Regulations for Existing or New Sources of Pollution, found at 40 CFR part 403, prohibits an indirect discharger from introducing into a POTW a pollutant that passes through or interferes with treatment processes at the POTW, and also sets the framework for the

² See discussion of authority for NPDES and BMP provisions in the preamble to the 2002 revised SPCC rule, 67 FR 47068.

implementation of categorical pretreatment standards. Specifically, 40 CFR 403.5(b)(6) prohibits the introduction into a POTW of “petroleum, oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through.”

5.3.3 Wastewater Treatment Exemption Clarification for Dry Gas Production Facilities

As EPA stated in a *Federal Register* notice (69 FR 29728), produced water tanks at dry gas facilities are eligible for the wastewater treatment exemption. Gas facilities that do not produce condensate or crude oil (i.e., dry gas facilities) do not meet the description of “oil production, oil recovery, or oil recycling facilities.” Therefore, produced water tanks used exclusively for wastewater treatment at such facilities are eligible for the exemption. Tanks that are eligible for the exemption do not count toward storage capacity.

At 69 FR 29730, EPA stated that “...[in] verifying that a particular gas facility is not an ‘oil production, oil recovery, or oil recycling facility,’ the Agency plans to consider, as appropriate, evidence at the facility pertaining to the presence or absence of condensate or crude oil that can be drawn off the tanks, containers or other production equipment at the facility, as well as pertinent facility test data and reports (e.g., flow tests, daily gauge reports, royalty reports or other production reports required by state or federal regulatory bodies).”

5.4 Oil/Water Separators Used to Meet SPCC Secondary Containment Requirements

5.4.1 Description of Oil/Water Separators Used to Meet SPCC Secondary Containment Requirements

Oil/water separators can be used to meet the SPCC requirements for secondary containment in §§112.7(c), 112.7(h)(1), 112.8(c)(2), 112.8(c)(11), 112.12(c)(2), and/or 112.12(c)(11). Additionally, §§112.8(b), 112.9(b), and 112.12(b) set forth design specifications for drainage associated with secondary containment provisions at the facility. Properly designed, maintained, and operated oil/water separators may be used as part of a facility drainage system to meet the secondary containment requirements of the rule.

Standard gravity and enhanced gravity separators (Figures 5-2 and 5-3), or other types of oil/water separators (separator designs may vary), may be used to meet secondary containment requirements. In this application, the separators are expected to have oil and water present in the system when there is an oil discharge or oil-contaminated precipitation runoff within the drainage area. Generally, these separators should be monitored on a routine schedule and collected oil should be removed as appropriate in accordance with procedures in the SPCC Plan.

When designing oil/water separators to be used as secondary containment (see Chapter 4 for a discussion of secondary containment requirements), good engineering practice would normally indicate that a Professional Engineer (PE) would consider:

- The drainage area that flows to the separator;
- The corresponding anticipated flow rate of the drainage system to the separator; and
- The appropriate capacity of the oil/water separator for oil and for wastewater.

Many oil/water separators used for secondary containment are installed in areas where they may receive considerable flow from precipitation. If the flow rate exceeds the maximum design rate of the separator, the separator may discharge accumulated oil and/or untreated wastewater; therefore, it may be an inappropriate choice for secondary containment and may result in a discharge to navigable waters and adjoining shorelines. The specifications from the oil/water separator manufacturer outline these and other design factors as important items to consider when specifying the use of a given oil/water separator for a given application. Additionally, the manufacturer specifies the maintenance requirements for these separators that would ensure proper operation of these devices.

When oil/water separators are used to meet SPCC requirements they must be properly operated and maintained to ensure that the unit will perform correctly and as intended under the potential discharge scenarios it is aimed to address (e.g., §§112.7(c), 112.8(c)(2), and 112.12(c)(2)). The required oil/water separator capacity should always be available (i.e., oil should not continually accumulate in the separator over a period of time such that the required storage capacity would not be available if an oil release were to occur within the drainage area). The use of oil/water separators as a method of containment may be risky as they have limited drainage controls to prevent a discharge of oil and rely heavily on proper maintenance.

5.4.2 Applicability of the SPCC Rule to Oil/Water Separators Used to Meet Specific SPCC Secondary Containment Requirements

Section 112.7(c) requires “appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in §112.1(b).” An oil/water separator may be used to satisfy this requirement for onshore or offshore facilities. This separator must be constructed to contain oil and prevent an escape of oil from the system prior to cleanup in order to comply with the secondary containment provision for which it is intended (§112.7(c)). A description explaining how an oil/water separator complies with secondary containment provisions, and how it is operated and maintained, should be included in the SPCC Plan. BMPs or O&M manuals which detail operation and maintenance procedures for oil/water separators used specifically for secondary containment may be referenced in the SPCC Plan and maintained separately.

Section 112.7(h)(1) requires “a quick drainage system” for areas where a tank car or tank truck loading or unloading rack is present. An oil/water separator may be used as part of a quick drainage system to meet this requirement. This containment system must hold at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility (§112.7(h)(1)).

Sections 112.8(b), 112.9(b), and 112.12(b) set forth design specifications for drainage systems associated with secondary containment at onshore facilities. Environmentally equivalent

measures can be used to satisfy these requirements (see Chapter 3 for a discussion of the environmental equivalence provision). In order to comply with secondary containment requirements, facilities might use ponds, lagoons, or catchment basins as part of the design criteria for facility drainage systems. However, an oil/water separator might serve as an environmentally equivalent measure to the ponds, lagoons, or catchment basins required by §§112.8(b)(3) and 112.12(b)(3). In this instance, EPA recommends that the oil/water separator be designed to handle the flow rate and volume of oil and water expected to be generated by facility operations. When certifying a facility's SPCC Plan, the PE must verify that the oil/water separator is adequately designed, maintained, and operated to provide environmentally equivalent protection (in accordance with §112.7(a)(2)) under the potential discharge scenarios it is aimed to address, in order to comply with the corresponding secondary containment provision.

Sections 112.8(c)(2), 112.8(c)(11), 112.12(c)(2), and 112.12(c)(11) require that all bulk storage containers be provided with secondary containment for "the entire capacity of the largest single container and sufficient freeboard to contain precipitation." An oil/water separator may be used for this purpose, but it *must be appropriately sized* to meet the requirements of the rule provision for which it is intended to comply. The oil/water separator must be capable of handling both the oil and precipitation that come into the separator from the general drainage area, and from any accidental discharge from the largest bulk storage container located within the drainage area for which the separator provides secondary containment (§112.8(c)(2), 112.8(c)(11), 112.12(c)(2), and 112.12(c)(11)). Good engineering practice would suggest that the use of oil/water separators for the specific secondary containment provisions be on a very limited basis and typically with smaller capacity container storage areas (e.g., drum storage area). For more information on specific secondary containment requirements for bulk storage containers, see Chapter 4 of this document.

The capacity of an oil/water separator used to meet secondary containment requirements does not count toward a facility's overall storage capacity. Any volume of oil that would flow into the oil/water separator would come from another source within the drainage area that is already generally counted in the facility storage capacity determination. Containers used to store recovered oil after oil/water separation, however, represent additional oil storage and count toward a facility's total storage capacity. These include slop tanks or other containers used to store waste oil.

The SPCC rule does not require redundant secondary containment around oil/water separators used for secondary containment (i.e., tertiary containment is not required).

5.5 Oil/Water Separators Used in Oil Production

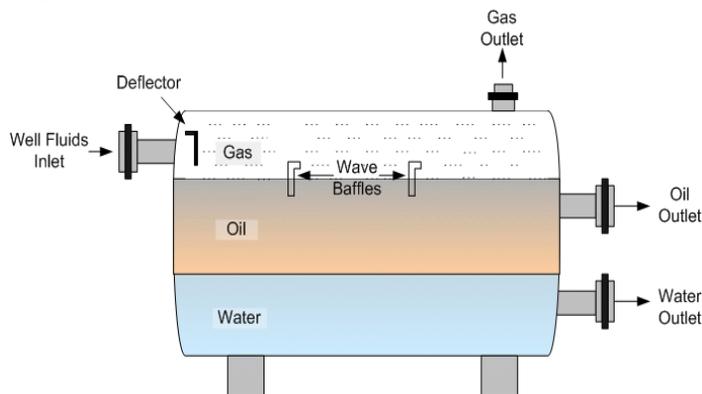
5.5.1 Description of Oil/Water Separators Used in Oil Production

Oil production oil/water separators are used at both onshore and offshore facilities. Separators and other separation equipment, such as heater-treaters and gun barrels, are used during oil production to separate the well stream into individual well fluids after they are extracted from the production well. Different processes and equipment may be used to separate the mixture

into oil/emulsion, water, and gas fractions. All such equipment is considered a bulk storage container needing specific secondary containment. For purposes of this guidance, this chapter focuses on those pieces of equipment that separate water from oil and the equipment through which these fluids flow.

There is quite a variety of production equipment used to separate and treat produced fluids. Some are operated under low pressure conditions, while others are operated at high pressure. A process called “free-water knockout,” illustrated in Figure 5-4, is generally used to separate large volumes of water from oil and gas generated from the well. Gun barrels, also called wash tanks, are generally found in older or marginal fields and are used to provide quiet retention time for the water to settle out of the produced well fluids (see Figure 5-5). A two-phase separator separates the well fluids into a liquid (oil, emulsion,³ or water) and a gas. The liquid exits the bottom of the separator and the gas exits the top, as shown in Figure 5-6. Three-phase separators separate well fluids into oil/emulsion, gas, and water. Gas exits from the top, oil/emulsion from the middle, and water from the bottom of this type of vertical three-phase separator (Figure 5-7). Three-phase separators are generally used when there is free water in the well fluids. If there is little or no free water, a two-phase separator might be used instead. Another type of equipment used to separate produced fluids, especially fluid emulsions, is termed a “heater-treater.” Heater-treaters use heat, electricity, and/or chemicals to reduce the emulsion viscosity and to separate out free oil, water, and gas in oil production. The designs of oil/water separators may differ from the examples provided.

Figure 5-4. Low pressure free-water knockout.



³ An emulsion is a colloidal suspension of a liquid within another liquid. In this case, small droplets of oil are dispersed through water.

Figure 5-5. Gun barrel oil/water separator.

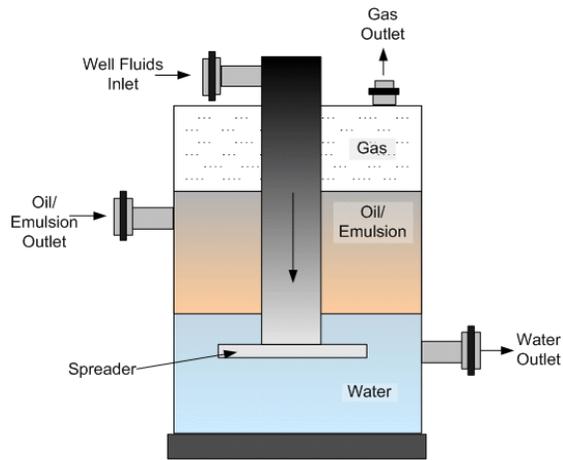


Figure 5-6. Two-phase oil/water separator.

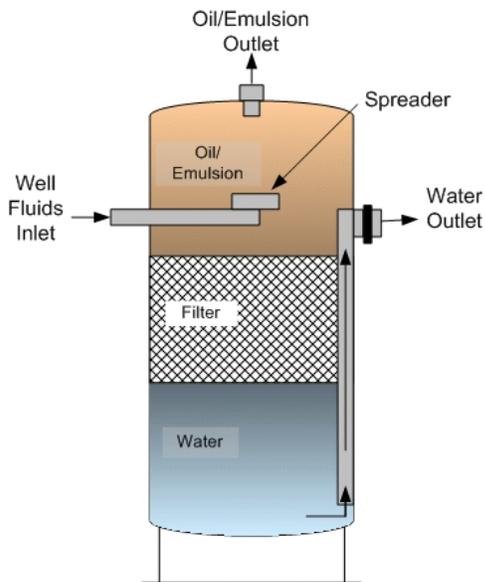
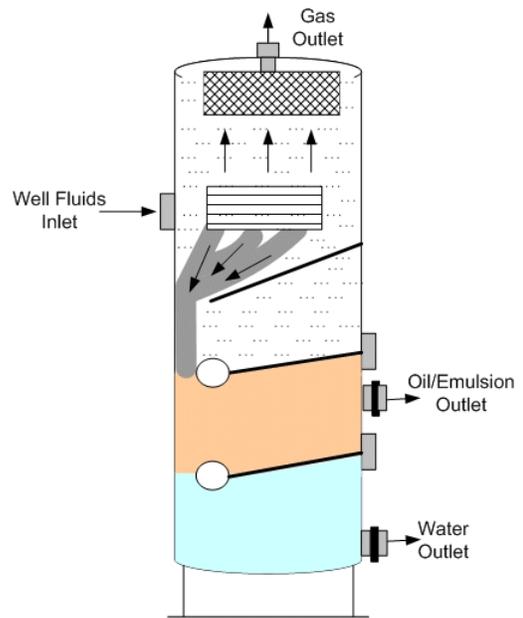


Figure 5-7. Three-phase oil/water separator.



In separators used for oil production, the momentum of the fluid flow is absorbed at the inlet, thereby reducing the fluid viscosity and allowing oil, gas, and water to separate out of solution. Gas then rises and flows out at the top of the separator, while oil and water fall to the lower portion of the vessel and coalesce in separate areas. With the appropriate settling time, the more dense free water settles beneath the less dense oil. Liquid levels are maintained by float-actuated control valves or dump valves. As the different pre-set liquid levels are reached, dump valves discharge water and oil from the separator to appropriate storage areas:

- Water is discharged from the bottom of the separator to a water tank;
- Oil is discharged out at a higher level to a oil storage tank; and
- Gas flows continuously out at the top of the separator to sales, a meter run, a flare, or a recovery system.

5.5.2 Applicability of the SPCC Rule to Oil/Water Separators Used in Oil Production

The SPCC rule's wastewater treatment exemption specifically states that the production of oil is not wastewater treatment for the purposes of §112.1(d)(6). The focus of the separation process in oil production is on removing water from oil, as opposed to removing oil from water.

Additionally, as stated in the preamble to the 2002 revised SPCC rule, production facilities generally lack NPDES or state-equivalent permits or prevention requirements, and thus lack the protections that such permits provide. Furthermore, Underground Injection Control (UIC) permits do not have prevention requirements for production facilities. Production facilities are normally unmanned and therefore lack constant human oversight and inspection. Produced water generated in the production process normally contains saline water as a contaminant in the oil, which in addition to the toxicity of the oil might aggravate environmental conditions in the case of a discharge (67 FR 47068). In some areas of the United States, produced water is fresh and may be discharged under a NPDES permit for beneficial use (e.g., irrigation, water for livestock).

The goal of an oil production, oil recovery, or oil recycling facility is to maximize the production or recovery of oil, while eliminating impurities in the oil, including water, whereas the goal of a wastewater treatment facility is to purify water. Neither an oil production facility nor an oil recovery or recycling facility treats water; instead, it treats oil. For purposes of the wastewater treatment exemption, produced water is not considered wastewater, and treatment of produced water is not considered wastewater treatment. Therefore, a facility that stores, treats, or otherwise uses produced water remains subject to the rule. At oil drilling, oil production, oil recycling, or oil recovery facilities, treatment units subject to the rule include open oil pits or ponds associated with oil production operations, oil/water separators (e.g., gun barrels), and heater-treater units. Open oil pits or ponds function as another form of bulk storage container and are not used for wastewater treatment (67 FR 47068,9). Although the ratio of water to oil can be relatively high, the quantity of oil involved can be still be substantial and pose a threat of a discharge to navigable waters and adjoining shorelines.

Oil/water separators used in the production of oil (e.g., heater-treaters and gun barrels) and other separation and treatment facility installations, are subject to the specific secondary containment requirements for oil production facility bulk storage containers in §112.9(c)(2). Therefore, oil/water separators used in oil production are considered bulk storage containers and are subject to the applicable SPCC requirements under §112.9(c):

- Oil/water separators used in onshore oil production are subject to the provisions of §112.9(c). For example, oil/water separators used in onshore oil production must have secondary containment designed to contain the capacity of the largest single container and sufficient freeboard to contain precipitation (§112.9(c)(2)). If specific secondary containment is determined to be impracticable for the equipment, the SPCC Plan must document the reason for impracticability and comply with the additional regulatory requirements in §112.7(d).
- Oil/water separators used in offshore oil production are subject to the provisions of §112.11(b) and (d) to prevent a discharge of oil. However, if other provisions of the rule (except secondary containment) can be met through alternative methods that provide environmental equivalence for this equipment, then the Plan must include a description in accordance with §112.7(a)(2).
- Vessels and equipment, such as glycol dehydrators and inline heaters, that treat only gas and that do not separate, treat, or contain oil, are not subject to the SPCC rule.

Oil/water separators used in oil production count toward the total storage capacity of the facility and must be considered when determining if a facility is regulated by the SPCC rule in accordance with §112.1(b) and (d)(2) and the definition of storage capacity in §112.2. In determining applicability of any container for calculating the total facility storage capacity, the preamble to the 2002 rule states:

The keys to the definition are the availability of the container for drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil, and whether it is available for one of those uses or whether it is permanently closed. Containers available for one of the above described uses count towards storage capacity, those not used for these activities do not. Types of containers counted as storage capacity would include some flow-through separators, tanks used for “emergency” storage, transformers, and other oil-filled equipment. (67 FR 47081)

5.6 Documentation Requirements and the Role of the EPA Inspector

5.6.1 Documentation by Owner/Operator

Oil/water separators used exclusively for wastewater treatment are exempt from all SPCC requirements, and no documentation is required for this equipment in the SPCC Plan.

For oil/water separators used to meet SPCC secondary containment requirements, the SPCC Plan should discuss the separator design capacity, configuration, maintenance, operation, and other elements of the drainage systems that ensure proper functioning and containment of the oil as required by §112.7(a)(3)(iii). Examples of elements that this discussion should include are:

- The presence and configuration of valves to prevent the accidental release of oil;
- Routine visual inspection of the oil/water separator, its contents, and discharges of effluent;
- Preventive maintenance of facility equipment affecting discharge, including the removal of settled pollutants and collected oil;
- A drainage area that flows to the oil/water separator and corresponding anticipated flow rate of the drainage system to the separator;
- Appropriate capacity of the oil/water separator for oil and for wastewater;
- Provisions for adequate separate storage capacity (based on the containment sizing required by the rule) to contain oil recovered in the oil/water separator; and
- Documentation associated with the maintenance and inspection of oil/water separators.

A separate bulk storage container used to store oil following separation in any oil/water separator (i.e., wastewater treatment, secondary containment, or oil production) is subject to all applicable requirements of 40 CFR part 112, including §§112.8(c) or 112.9(c), as appropriate.

For oil/water separators used in oil production, the oil/water separators are considered bulk storage containers to be included in the SPCC Plan. The location of these containers must be indicated on the facility diagram and discussed in the general requirements in accordance with §112.7(a)(3). For more information on facility diagrams, refer to Chapter 6 of this document. The facility owner/operator may determine that the sized secondary containment required for these oil/water separators is impracticable, pursuant to §112.7(d). If impracticability is determined for sized secondary containment, the SPCC Plan must clearly explain why secondary containment is not practicable and provide an oil spill contingency plan following the provisions of 40 CFR part 109. In addition, such facilities must conduct integrity and leak testing of bulk containers and associated valves and piping, and provide a written commitment of manpower, equipment, and materials to respond to oil discharges (§112.7(d)). For more information on impracticability, refer to Chapter 4 of this document.

5.6.2 Role of the EPA Inspector

As with other aspects of the SPCC Plan, the certifying PE will review the use of and applicable requirements for oil/water separators at a facility and ensure that they are consistent with good engineering practice.

The EPA inspector will verify that any oil/water separators at a facility that are not addressed in the SPCC Plan are in fact used exclusively for wastewater treatment and not to meet any requirement of part 112. This review considers the intended and actual use of the separator. The EPA inspector should consider the intended use of the separator at the facility (e.g., wastewater treatment, secondary containment, oil production, recovery, or recycling), any flow diagrams illustrating the use of the separator, and the design specifications of the unit in evaluating the proper application of the wastewater exemption. The EPA inspector may also consider the flow-through capacity of the separator, the emulsion of oil present within the separator, and the design specifications of the unit in evaluating the use of the oil/water separator.

For oil/water separators used to meet SPCC secondary containment requirements, the EPA inspector will verify that the Plan includes, for each oil/water separator used as secondary containment, a discussion of the separator design capacity, configuration, maintenance, and operation, as well as other elements of the drainage systems that ensure proper functioning and containment of the oil in accordance with §112.7(a)(3)(iii). Inspectors should note the risk associated with this form of containment and should evaluate the design, maintenance, operation, and efficacy of oil/water separator systems used for containment very carefully. Generally, these separators should be monitored on a routine schedule, and collected oil should be removed as appropriate and in accordance with the drainage procedures in the Plan.

Oil/water separators used in the production of oil (e.g., heater-treaters and gun barrels) and other separation and treatment facility installations, are subject to the specific secondary containment requirements for oil production facility bulk storage containers in §112.9(c)(2). The SPCC Plan must address this equipment and include the storage capacity of the equipment in the storage capacity calculations (§112.1(b) and (d)(2) and the definition of storage capacity in §112.2.) If sized secondary containment is determined to be impracticable for the equipment, the SPCC Plan must document the reason for impracticability and comply with the additional regulatory requirements in §112.7(d).

By certifying the SPCC Plan, a PE attests that the Plan has been prepared in accordance with good engineering practice and with the requirements of 40 CFR part 112, and that the Plan is adequate for the facility. Thus, if the wastewater treatment exemption is certified by the PE or if other oil/water separator uses are properly documented, they most likely will be considered acceptable by EPA inspectors. However, if the documented uses of the oil/water separators do not meet the standards of common sense, appear to be incorrect, deviate from the use described in the Plan, are not maintained or operated in accordance with the Plan, or simply do not operate correctly, further follow-up action may be warranted. This may include a request for more information or a Plan amendment in accordance with §112.4(d).

ATTACHMENT I

Equipment Maintenance Checklist

CSX Intermodal

SAVANNAH TERMINAL

DATE _____

Serviced By _____

PUMP STATION MAINTENANCE CHECK

Influent Pump
(Oil/Water Separator)
Model Unknown

General Condition of Pump:

Cover, Manhole Cover Missing Yes No

Switch Disconnect On Yes No

Alarm On Yes No

Alarm Light On Yes No

Pump Circuit Breakers On Yes No

HOA in Auto Yes No

Reset Tripped Yes No

Amperage Readings: _____

Resistance Readings: _____

General Comments:

Repairs/improvements needed/suggested:

CSX Intermodal

SAVANNAH TERMINAL

DATE _____

Serviced By _____

PUMP STATION MAINTENANCE CHECK

<p style="text-align: center;">Effluent Pump (Oil/Water Separator)</p> <p style="text-align: center;">Myers Pump Model – CT15 1.5 HP, 1ph, 240 V 10 GPM @ 60 FT-TDH</p>

General Condition of Pump:

Cover, Manhole Cover Missing Yes No

Switch Disconnect On Yes No

Alarm On Yes No

Alarm Light On Yes No

Pump Circuit Breakers On Yes No

HOA in Auto Yes No

Reset Tripped Yes No

Amperage Readings: _____

Resistance Readings: _____

General Comments:

Repairs/improvements needed/suggested:

OWS/FILTER MAINTENANCE CHECK

General Condition of OWS:

- Electrical Panels Locked ___ Yes ___ No
- General Area Clean ___ Yes ___ No
- Floor Cover, Manhole Cover Sections Missing
- Grit/Sludge Level in Storage Basins Checked ___ Yes ___ No
- Debris cleaned from Storage Basins ___ Yes ___ No
- Waste Oil Collection Container Checked ___ Yes ___ No
- Float Controls Checked ___ Yes ___ No
- Valves Exercised ___ Yes ___ No
- Pressure Gauges Checked ___ Yes ___ No
- Pressure at Sediment Pre-Filter _____
- Sediment Pre-Filter Bag changed ___ Yes ___ No
- Inlet Pressure at AHP-55 Unit #1 _____
- Outlet Pressure at AHP-55 Unit #1 _____
- Inlet Pressure at AHP-55 Unit #2 _____
- AHP-55 Units Backwashed ___ Yes ___ No
- Effluent Sample collected and forwarded to laboratory ___ Yes ___ No

OW Separator

- Checked Exterior Condition ___ Yes ___ No
- Checked Interior Condition ___ Yes ___ No
- Coalescing Packs checked and cleaned ___ Yes ___ No
- Oil Skimmer checked ___ Yes ___ No
- Exercised Valves ___ Yes ___ No
- Float Controls Checked ___ Yes ___ No

CSX Intermodal

SAVANNAH TERMINAL

DATE _____

Serviced By _____

OWS/FILTER MAINTENANCE CHECK (CONT.)

General Comments:

Repairs/improvements needed/suggested:

CSX Intermodal

SAVANNAH TERMINAL

DATE _____

Serviced By _____

MAINTENANCE PAD

Condition of Slab:

Excessive Oil and Grease Buildup Yes No

Access Manholes Checked Yes No

Evidence of Product in Access Manholes Yes No

Storm Sewer System Checked Yes No

Excessive Oil/Grease in Storm Sewer Yes No

Excessive Grit in Storm Sewer Yes No

Excessive Trash in Storm Sewer Yes No

General Comments:

Repairs/improvements needed/suggested:
