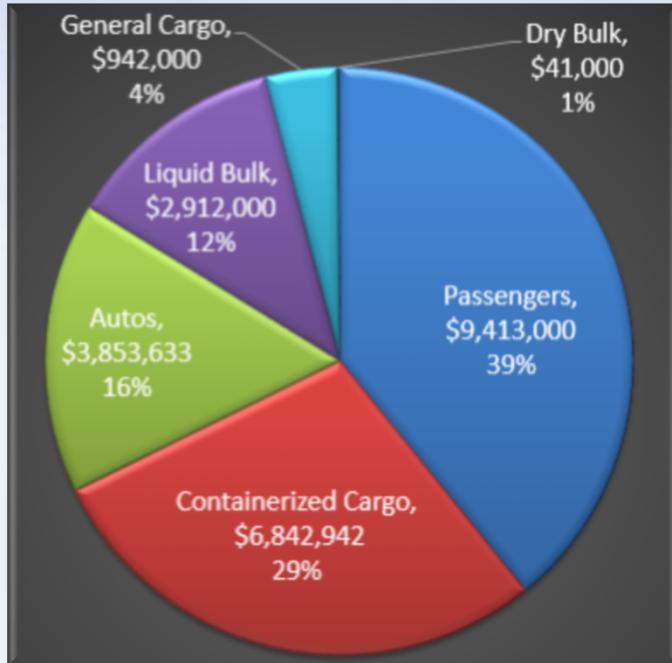


2017 Hilo Harbor Stormwater Awareness Training



MĀLAMA I KE KAI
Protect our Harbor Waters

Hilo Harbor Plays a Crucial Role In Our Island Economy



Revenue by Industry is Dominated by Passengers and Containerized Cargo

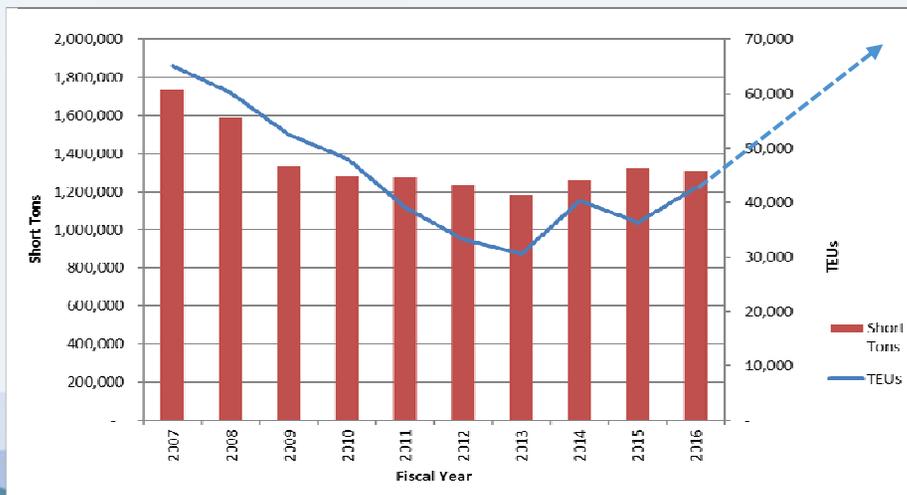
(Fiscal Years 2012-2016)

Imports & Exports

Fiscal Years 2012-2016



Cargo Volumes Slumped Following the Recession and Are Now Recovering



PROTECT OUR HARBOR WATERS



Agenda

1) Welcome & Stormwater Pollution Introduction

-Spencer Yim, *Environmental Section, Engineering Branch, DOT Harbors Division*

2) Pollutants, Sources & Impacts

3) Environmental Goals & Regulations

4) Break (15 min)

5) Best Management Practices (BMPs)

6) Quiz/Review/Questions . . .



Stormwater Pollution

- Also called non-point source pollution
 - Natural and manmade
 - Much greater quantities than point sources
- Stormwater Pollutants
 - Any type of material or waste that **degrades water quality and affects public health, the environment or the beneficial uses of receiving waters.**
 - From urbanization, erosion and natural processes
 - Many are naturally occurring in surface waters, but are **damaging at elevated levels**



Pollutant Categories

3 Categories: Physical, Chemical and Biological

- Physical Pollutants

- **Sediment**

- Sources: Construction Sites, Erosion, Urban Areas, **Container Yards** & Agricultural Practices
 - Negative Impacts:
 - **Reduce light transmission**
 - **Smother habitat**
 - Impair recreational use of water bodies
 - Also, **transport other pollutants**



Physical Pollutants (Continued)

- Temperature (*aka* Thermal Pollution)
 - Sources: Power plants, industries, removal of trees along streams, impervious (paved) areas heat up water flowing to streams
 - Impacts: Threat to stream insects & fish species
- **Gross Solids (Garbage, Trash, Plastics, etc.)**
 - Source: Human activities
 - Impacts: **Threat to aquatic life**; impair recreational uses, expensive to clean up



Chemical Pollutants

- **Nutrients (Nitrogen & Phosphorus)**
 - **Sources:** Atmosphere, fertilizers, sewage leaks
 - **Impacts:** Algae blooms, Blue Baby disease
 - **Nitrogen forms:** Ammonia, Nitrate/Nitrite, TKN
 - **Phosphorus forms:** Orthophosphates, Total P



Chemical Pollutants

- **Metals**

- **Sources:** streets & highways, **buildings, materials, industrial activities**, atmospheric deposition
- **Impacts:** toxic to aquatic life, bioaccumulation, threat to human health
- **Forms of Metal Pollutants** (Can be dissolved or solid)
 - Copper
 - **Zinc**
 - Lead
 - Chromium
 - Cadmium
 - **Iron**
 - **Aluminum**
 - Others



Honolulu Pier 29 Sediment Characteristics

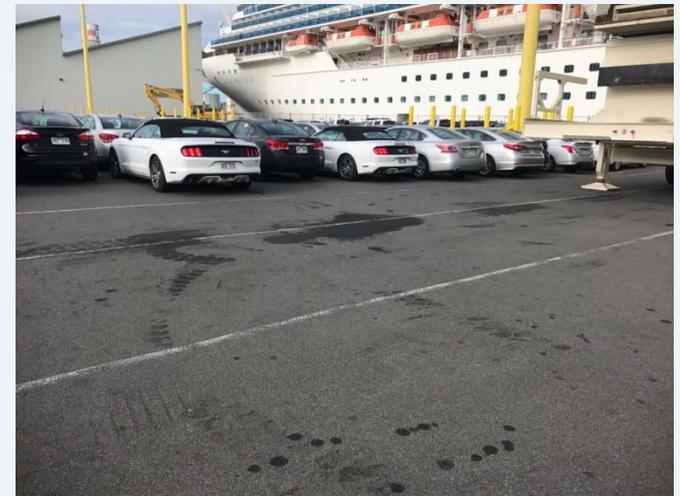
		Gravel		Coarse Sand	Medium Sand		Fine Sand	Silt	Clay
Percent	%	1.2%		22.7%	22.7%		58.4%	12.6%	0.0%
Sieve	#	4	10	20	40	60	140	230	<230
Ar	mg/kg	1.5	10	18	21	15	17	21	25
Pb	mg/kg	46	40	250	310	350	210	160	160
Al	mg/kg	2,800	3,600	3,700	4,700	7,800	7,800	7,500	8,300
Cd	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND
Cr	mg/kg	100	51	190	210	170	130	130	150
Cu	mg/kg	66	69	150	180	160	180	220	290
Fe	mg/kg	120,000	190,000	360,000	280,000	120,000	110,000	150,000	160,000
Zn	mg/kg	1,600	2,000	2,900	6,400	8,100	7,100	6,200	6,200
Hg	mg/kg	ND	ND	ND	0.019	0.026	0.077	0.045	0.054
SG		1.9	2.6	2.6	1.8	1.0	1.2	1.2	1.5

Note: SG = Specific Gravity



Chemical Pollutants (Continued)

- **Hydrocarbons**
- **Forms of Hydrocarbons**
 - Oil and Grease
 - Fuels
 - Hydraulic Fluids
- **Sources**
 - Streets, highways, **container yards**
 - **Fueling sites**, emissions
 - **Illegal dumping**
 - **Leakages** (vehicles & equipment)
- **Impacts**
 - **Threat to aquatic life**
 - Threat to human health



Chemical Pollutants (Continued)

- **Organic Compounds**

- Paints & paint thinners
- Solvents
- Degreasing agents
- Curing agents
- Sealing compounds
- PCBs (polychlorinated biphenyls)

- **Sources: Construction sites, industrial & maintenance facilities, illicit discharges, poor storage & handling of materials**

- **Impacts:**

- Threat to aquatic life, Bioaccumulation, Human health risks



Chemical Pollutants (Continued)

- **Pesticides**
 - Herbicides
 - Rodenticides
 - Insecticides
- **Sources:**
 - Agriculture
 - Urban landscaping
- **Impacts:**
 - Threat to aquatic life
 - Bioaccumulation
 - Human health risk



Biological Pollutants

- Bacteria and Viruses: E. coli, Fecal coli, etc.
- **Sources:**
 - Leaking septic/sewer systems (sewage)
 - **Illicit connections**
 - Animal wastes
- **Impacts:**
 - Human health risk of diseases
 - Threat to aquatic life



Secondary Pollutant Forms

- **Oxygen Demand, pH, Algae, Chlorophyll**
 - **Oxygen Demand Forms:**
 - Dissolved Oxygen (DO)
 - Biochemical Oxygen Demand (BOD)
 - Chemical Oxygen Demand (COD)
 - **Oxygen Demand Sources:** Sediment, nutrients, organics and other pollutants as particles and soluble phases (e.g., **molasses & fire fighting foam/FFF**)
 - **Oxygen Demand Impacts:**
 - **Reduced Dissolved Oxygen levels harm aquatic life**
 - **Fish kills**



Honolulu Harbor Molasses Spill, Sept. 2013



YB Top Pick Fire Cleanup @ Honolulu Pier 40, Dec. 19, 2016



Hilo Harbor Spills



Source Control

*It is less costly and less time consuming to
stop pollutants
at their source rather than to
remove them from stormwater
once they have entered the drainage system.*



Environmental Goals



Clean Water

Healthy Reefs

Sustainable
Environment



Environmental Goals

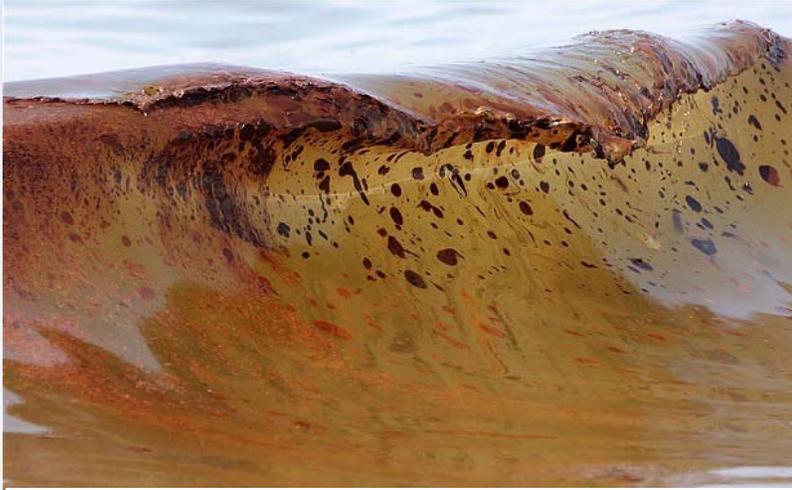


Healthy Environment → Health Family!!!

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Prevention



How can we prevent this?

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Pollution Pathways?



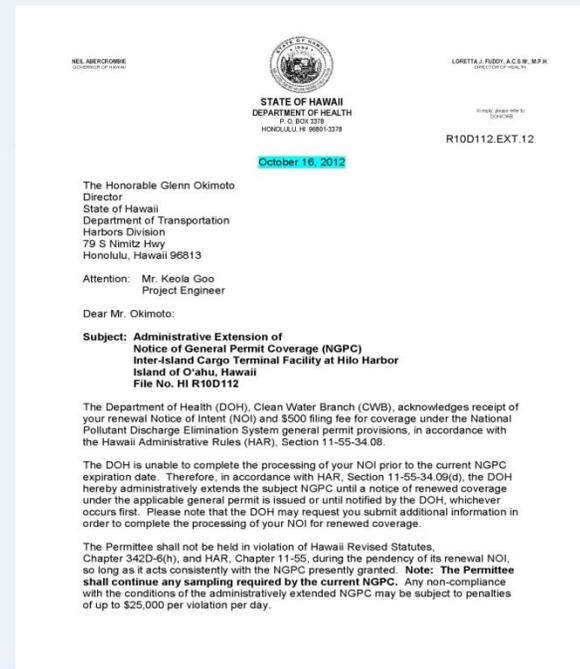
Storm Drains are designed to carry untreated stormwater directly into the Harbor



Permits & Requirements



National Pollutant Discharge Elimination System (NPDES) Permits & HAR Title 11 Chapters 54 & 55



Allowable Discharges

Permitted by DOH/EPA:

1. Daily Operations

- Water line flushing
- Air conditioning condensate
- Landscape irrigation
- Discharges from potable water sources and foundation drains



2. Groundwater

- Rising groundwater (tidal intrusion)
- Uncontaminated groundwater infiltration
- Uncontaminated pumped groundwater

3. Natural Origin

- Springs

4. Emergencies

- Discharge from fire fighting activities



Pollution Prevention & Good Housekeeping

- Proper Labeling and Handling of Cleaners, Solvents, and Chemicals
- Organized Chemical Storage
- Proper Disposal of Chemicals
- Covering Stored Metals
- Proper Equipment/Material Storage
- Regular/Timely Equipment Maintenance
- Site cleaning procedures should be in place



Know the Regulations



1. Industrial NPDES
2. Vessel General Permit
3. Harbors Washing Approval
4. Spill Prevention, Control, and Counter Measure (SPCC)
5. Tier II
6. Hazardous Waste
7. Good Housekeeping



1. Industrial NPDES Permits

Allows the discharge of stormwater associated with industrial activities, such as:

- Material Handling and Storage
- Equipment Cleaning
- Maintenance and Repair
- Fueling
- Washing
- Sanding and Painting

Conditions of the Permit:

- Storm Water Pollution Control Plan (SWPCP)
- Stormwater sampling



2. Vessel General Permit



Section 401 WQC Discharges from Non-Recreational Vessels

<https://www.epa.gov/npdes/vessels>

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3. SPCC Plan

Required if
>1,320 gallons
of oil and oil
products are
stored and used

40 CFR 112



Make sure you have a SPCC Plan and **FOLLOW IT!**



4. SPCC Plan



Be aware of the storm drains at your facility.



5. Hazardous Waste

HAR 11-260



Make sure you label and store drums correctly!

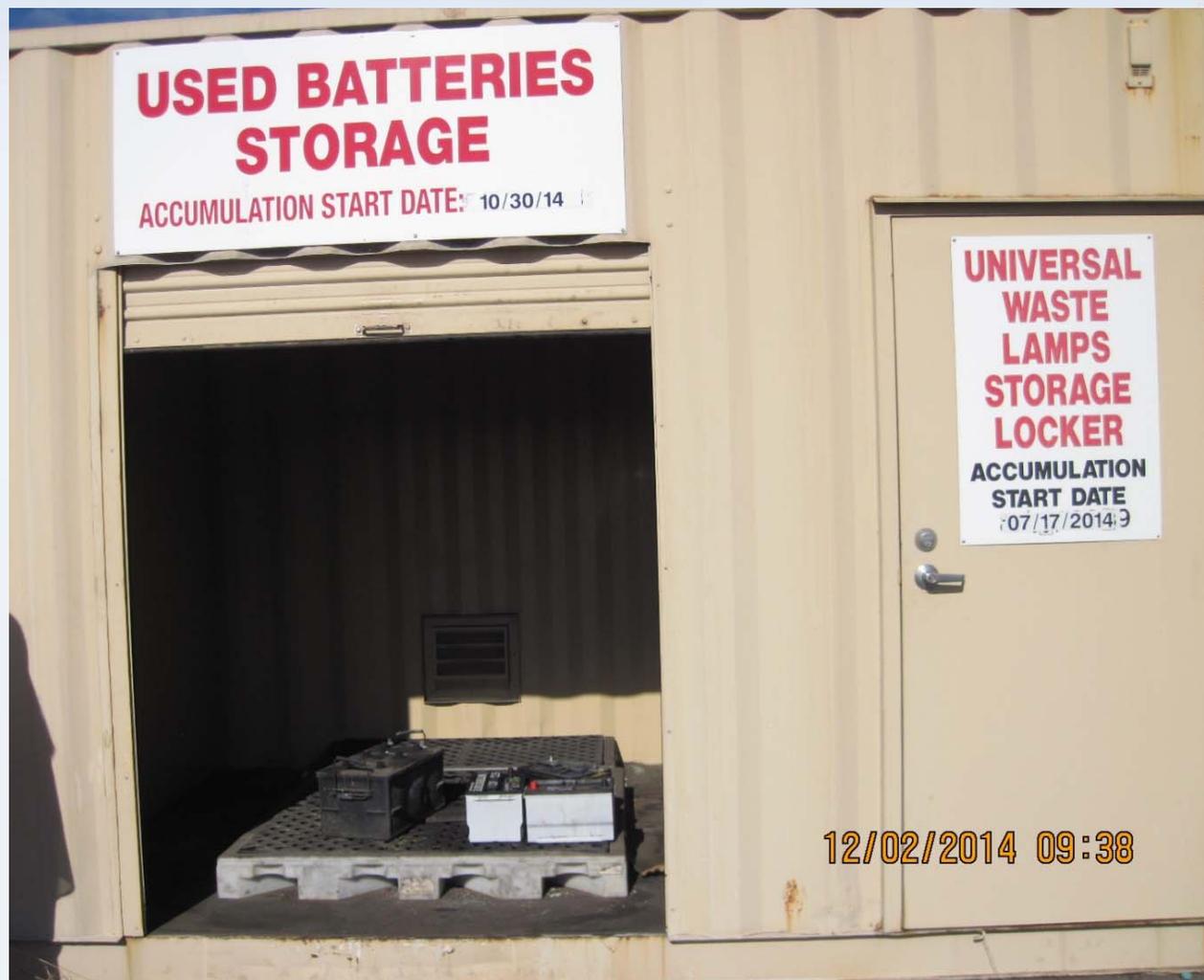


6. Universal Waste

Examples:

- Fluorescent lamps,
- Batteries, and
- Anything with mercury

HAR 11-273



Short Break (15 min)

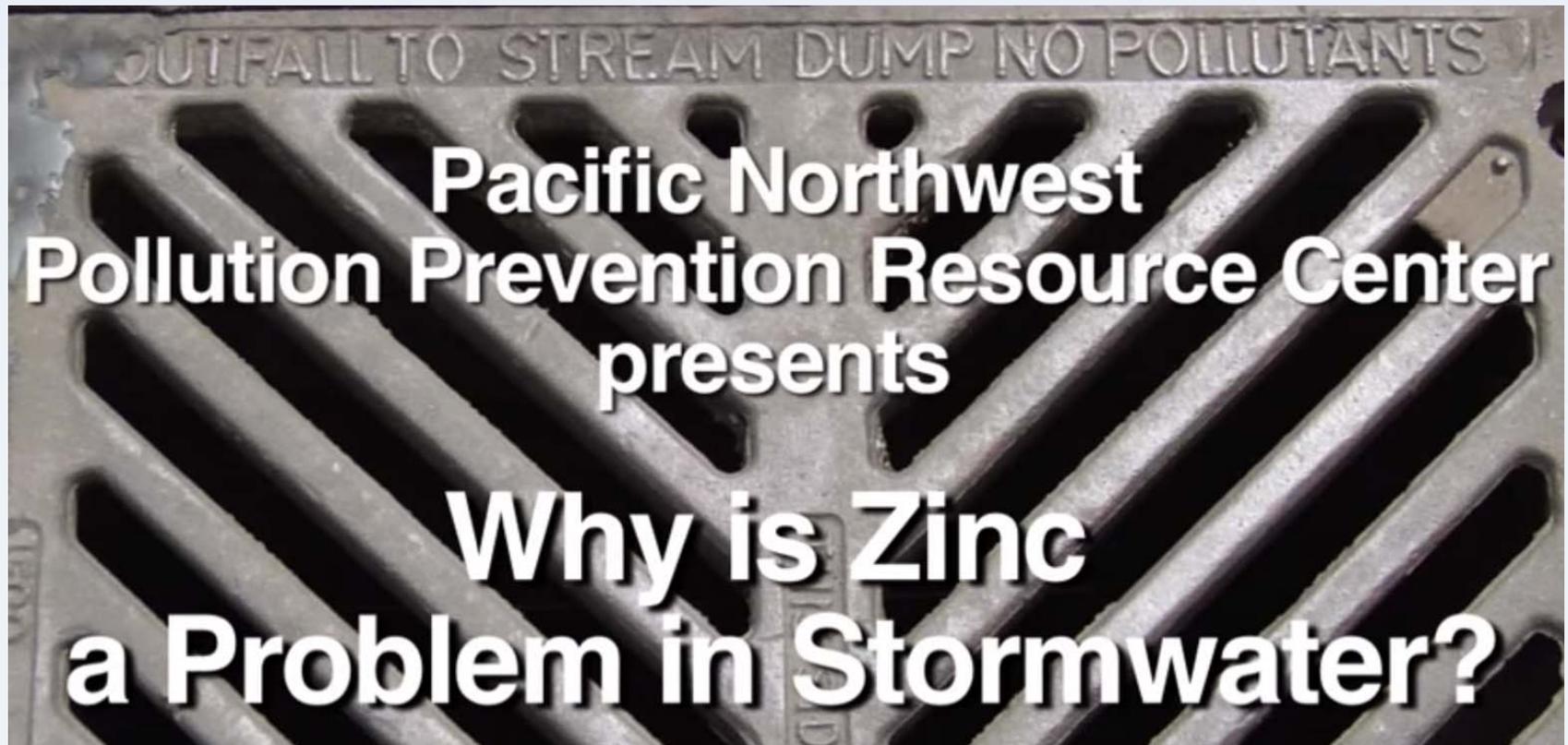
Take a Breather



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Short Film (8 min)



<http://portofpt.com/preventing-zinc-pollution-in-stormwater/>

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Good Housekeeping



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Hand Washing

Keep It
Contained



Fueling



Remain
Vigilant

Be Prepared



Drain Inlet Protection



Filter Fabric



Permanent BMPs

Grate Inlet Filter (GISB)

PROVEN STORMWATER TREATMENT TECHNOLOGY

Media Filter

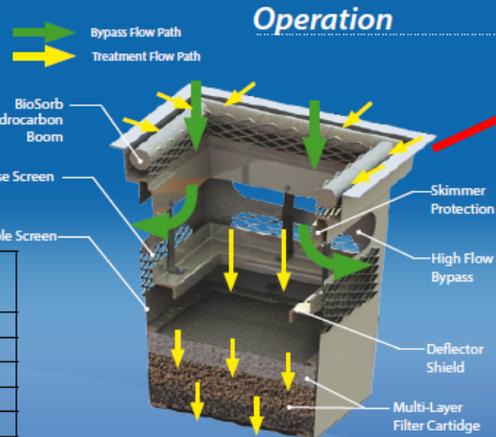
The Bio Clean Grate Inlet Media Filter (GISB-MF) is an advanced level filtration device designed with a multi-layered media filter for increased removal efficiencies.

Performance

- 85% Removal of Fine TSS
- 69% Removal of Dissolved Phosphorus
- 95% Removal of Copper
- 87% Removal of Lead
- 95% Removal of Zinc
- 90% to 95% Removal of Oils & Grease
- 68% Removal of Fecal Coliform (bacteria)

Specifications

Model #	Media Treatment Flow (CFS)	Screen Treatment Flow (CFS)	Bypass Flow (CFS)
BC-GISB-MF-12-12-12	0.007	0.2	0.5
BC-GISB-MF-18-18-18	0.02	0.5	0.8
BC-GISB-MF-24-24-24	0.04	0.9	4.4
BC-GISB-MF-36-36-24	0.17	1.8	13.4
BC-GISB-MF-48-48-18	0.35	2.4	13.3

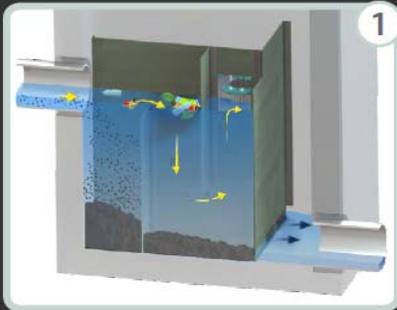
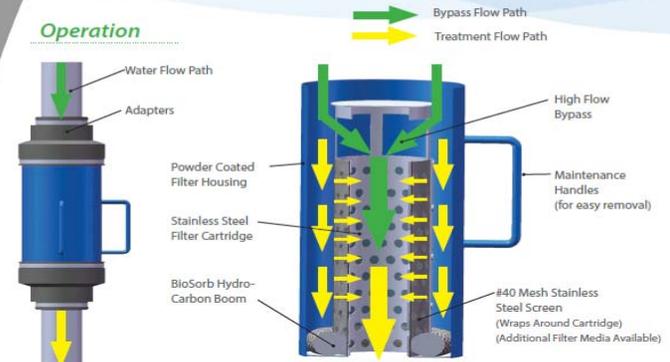


Enhanced with Media to Meet Removal Requirements

Downspout Filter

PROVEN STORMWATER TREATMENT TECHNOLOGY

Operation



Pre-Treatment

To reduce loading on the membrane cartridge, runoff is initially passed through the pre-treatment chamber to capture trash, hydrocarbons and sediments. Once runoff is pre-treated it is directed to the filter chambers for primary treatment.

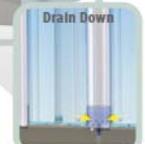
Patent Pending

KRAKEN



Membrane Filtration - Fill Up

During the fill up process a riser tube prevents flow through the membrane cartridge until the water level nears the top of the cartridge. This ensures loading is evenly distributed over the vertical height of the cartridge - maximizing efficiency.



An orifice in the bottom of the riser tube in the front row of cartridges, allows the chamber to slowly drain down, eliminating standing water after the storm event.

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Maintenance

Conduct Maintenance Under Cover



Remember to practice **good housekeeping** around your facility.



Vehicle and Equipment Storage

Remember to
use a **drip pan**
under vehicles!



What is the potential deficiency?



What good housekeeping practice can be implemented to avoid a deficiency?



Illicit Discharges

Any non-stormwater discharge that poses a risk to the environment.



Illicit (Illegal) Discharges

Common sources of illicit discharges include:

- Leaking sewage
- Collection and transmission lines
- Commercial carwash and laundry wastewater
- Floor washing to shop drains
- Commercial Vehicle and Equipment washwater
- Potable line flushing that runs across hardscapes
- Pumping of vaults or trenches
- Construction activities
- Liquid wastes containing oil, paint, and process water
- Waste water from manufacturing or equipment processes
- Pesticides, herbicides, and other industrial chemicals



Illicit Discharges



Uncontained materials over a trench drain and near pier's edge.



Illicit Discharges



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Illicit Discharge



Be sure to regularly inspect your facility to identify and clean any oil stains.



Illicit Discharge?



Unpolluted air conditioning condensate is **NOT** an illicit discharge.



Illicit Discharge?



Do not dump mop water into a storm drain



Illicit Discharge?

Soapy water is an illicit discharge



Remember to get Harbors approval to wash!



Suspected Illicit Discharge Reporting

Point of Contacts for Suspected Illicit Discharge Reporting (Hawaii Island)

Agency	Telephone Number
Harbors Hawaii District Office	(808) 933-8850
Harbors Hawaii District Assistant Manager / GPIV	(808) 960-2177 (Cellular)
Harbors Hawaii District Marine Cargo Specialist	(808) 933-8858, (808) 854-5042 (Cellular)
Hawaii Department of Transportation Harbors Division, Engineering Environmental Section [HAR-EE]	(808) 587-1962, (808) 587-1976, (808) 587-1960, (808) 587-1963



Suspected Illicit Discharge Report

Observer Information			
Name:			
Office Code:		Telephone Number:	
Report Date:			
Description of Suspected Illicit Discharge			
Address or Location:		Date and Time:	
Description: (Include Substance and Amount, if known)			
Media into which the discharge occurred:			
<input type="checkbox"/> Air <input type="checkbox"/> Natural Soil <input type="checkbox"/> Concrete/Asphalt Pavement <input type="checkbox"/> Stream <input type="checkbox"/> Ocean <input type="checkbox"/> Other: _____			
Responsible Party: (if known)			
Cause of Discharge: (if known)			
Clean-up Actions: (if applicable)			
Notifications Made:			



Spill Response



1. Assess the Risk
2. Select PPE
3. Confine the Spill
4. Stop the Source



Spill Response



5. Clean-up

6. Decontaminate
and Dispose of
Wastes

7. Complete
Required
Report



Notification List for Oil Spills (Hawaii Island)

Oil Spills (Hawaii Island)			
<p>General Information: The following shall be notified in the event of an oil spill. Oil spill refers to any sheen (or more significant spill) ON WATER or any petroleum product release (≥ 25 gallons) ON LAND.</p> <p>Note: If a spill poses an imminent or immediate threat to public health and/or the environment, dial 911 to request fire, police, or emergency medical service personnel response.</p>			
Standby Supervisor		(via phone)	(808)-960-2177
Cargo Coordinator and/or Harbor Police		(via phone)	(808)-854-5042
Hawaii State Emergency Response Commission/ Department of Health Hazard Evaluation & Emergency Response		(working hours)	(808) 586-4249
		(after hours)	(808) 247-2191
Local Emergency Planning Committee	County of Hawaii	(working hours)	(808) 936-0858
		(after hours)	Please leave a message.
National Response Center		(24 hours)	1-800-424-8802
Engineering Branch Environmental Section		(working hours)	(808) 587-1962, (808) 587-1976, (808) 587-1960, (808) 587-1963
		(after hours)	Please leave a message.



<https://www.youtube.com/watch?v=hKFV9IquMXA>

Short Film (4 min)



Chadd Onohi Paishon
Nā Kālai Wa'a Senior Captain

<https://www.youtube.com/watch?v=hKFV9IquMXA>

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Questions

- Harbors Stormwater Website:

<http://hidot.hawaii.gov/harbors/library/storm-water-management/>

** Today's Power Point slides will be posted on this website.*

- Harbors Division Engineering Environmental Contacts:
 - Spencer Yim, P.E., 587-1963 Spencer.K.Yim@hawaii.gov
 - Joy Zhang, P.E.: 587-1960, ying.j.zhang@hawaii.gov



Training Quiz

- Which of the following activities can generate stormwater pollutants?
 - Off-site tracking of sediment on paved roads.
 - Uncontained aggregate handling between vessels and the shore.
 - Uncontained equipment washing.
 - All of the above.
- True or False? Stormwater runoff normally discharges through the storm drain system and empties into the harbor without any treatment.
 - True
 - False
- Which of the following are permitted to be discharged into the storm drain?
 - Unpolluted AC condensate water.
 - Gasoline, diesel, used oil, and paints.
 - Rainwater
 - a and c.
- What is the definition of an illicit discharge?
 - An illegal forward pass.
 - A non-stormwater discharge that poses a risk to the environment.
 - Use of a stolen credit card.
 - An indecent cargo movement.
- The picture below is a good example of a Best Management Practice (BMP) because:
 - Drums are inside and under cover.
 - Oil is not a pollutant.
 - Drums are properly marked and equipped with secondary containment.
 - None of the above.
- True or False? Every tenant that handles chemicals should have a spill kit on-site to promptly respond to spills that may occur.
 - True
 - False
- True or False? Hand washing water can be discharged to the ground as long as there is just soap in it.
 - True.
 - False.
- True or False? Mud and dirt on the ground should be washed down the storm drain using a water hose.
 - True.
 - False.
- Common forms of hydrocarbon pollutants are:
 - Zinc, iron and aluminum
 - Oil & grease, fuels and hydraulic fluids
 - Garbage, trash and plastics
 - Sediment, nutrients and organics
 - None of the above.
- Which of the following are good examples of BMPs?
 - Pick up litter on the ground
 - Promptly responding to a spill
 - Using a drip pan for a leaking vehicle until maintenance can be completed
 - All of the above



Training Quiz Review

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Please turn in your completed quiz and training evaluation form before you leave

Mahalo 

