Improving Construction Sites Stormwater Compliance with Inspections, Data Analytics, Training, and Enforcement Tools

**DOT Protect Our Water Conference** 

November 18, 2020







### Introduction: 3<sup>rd</sup> Party Construction Inspection Program and Data Analytics

Jennifer Little **JACOBS** 

Lead 3rd Party Construction Inspector

#### **3PI Overview**

- 3rd Party Construction Inspection Program
  - Adopted by DFM SWQ Branch in 2016
- 7 Inspectors are zoned throughout Oahu
- Visual Inspections
  - Public: DDC Divisions- CIP projects (CD, FD, MED, ENV-WEC, DTS, BWS)
  - Private: DPP- City permitted projects
- CloudCompli: Report online database
  - Upload inspection reports
  - Analyze data
- Data Analysis
  - Understand common BMP deficiencies, individual site scoring, and average contractor scoring
  - Allows us to assess and compare projects and contractors
  - Assist the City's training efforts



### **CloudCompli- Inspection Reports Digitized**



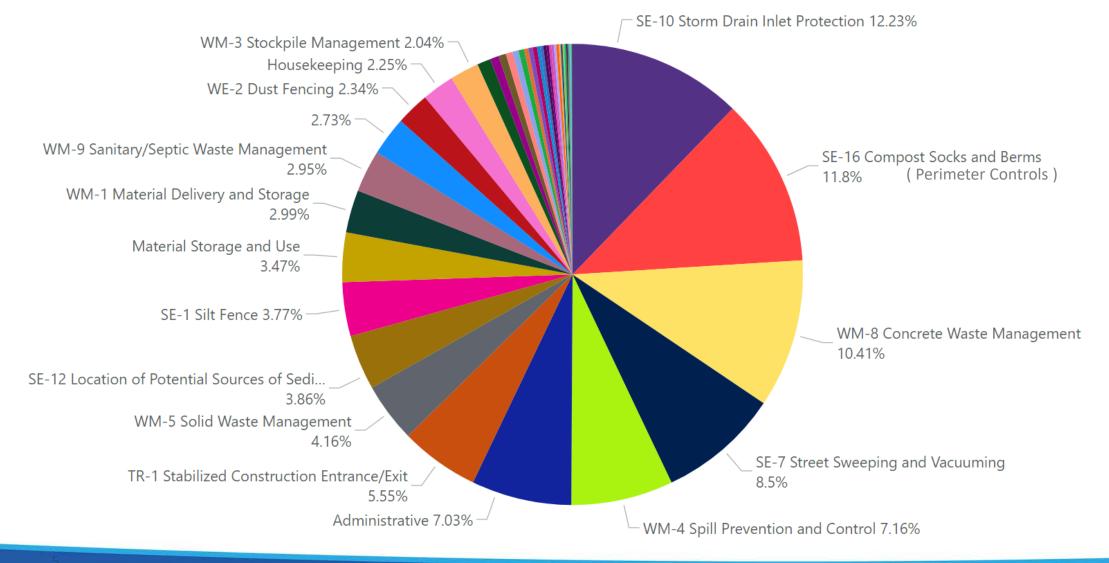
#### THIRD PARTY (OVERSIGHT) INSPECTION CHECKLIST

Project					
Name	ame Rehabilitation of Localized Stream, Phase 11C (Kalama Valley, Kamehame Ridge, Hawaii Kai)				
Address	471 Kealahou Street, Hawaii Kai, HI 96825	Latitude/Longitude	21.2945036, -157.6981354		
Туря	Private I CIP Project	Category			
тмк		Acres Disturbed			
City Department	DDC	Total Acres			
Division	Civil	Percent Complete	63		
City Inspector	Nul Tan	Contractor	Road & Highway Builders LLC		
On 303(d) List	Xes No	Developer/Owner	City and County of Honolulu		
NPDES Pernit		Building Permit			
NGPC (App C)	HER108561	Grabbing Permit			
NGPC (App G)		Onding Permit			
		Stockpiling Permit			

Inspection						
Inspection Date/Time	2017-04-03 10:00	Previous Inspection Date	2017-03-30			
Weather Conditions	80s, clear, 0-10mph winds.	De, clear, O-10mph winds.				
Thind-Party Inspector	Jennifer Little	Jennifer Little				
Signatum		CAN-				

	Yes	No	N/A	Comments	Deficiencies
Is the contractor familiar with the requirements of the City and County Best Management Practices Massual for Construction Sizes in Honolula, CCII Rules for Ibosion Rules, and Sediment Control Standard?	⊠			Yes the contractors is familiar with the City and County Best Managemeth Practices Manual.	None
Does the site have an ESCP? If yes, is the ESCP certified, signed, and dated?	×			Yes the BMP plan is located inside of the SWPPP	None
Does the site have a SWPPP? If yes, is the SWPPP certified, signed, and dated?	8			Yes the SWPPP is signed certified dated and responsible perion named. Contactor is crusting an amendment to change the name of the engineer identified.	None
Is the ESCP or SWPPP up to date and does it reflect current BMP implementation?	8			BMPs change as the project progresses and therefore cannot be completely up-to-date every day.	None
Is there a record of periodic BMP inspection by field office staff?	8			Records of the BMP inspections are kept in the SWPPP.	None
Are the correction action reports available?				The project has not had any corrective action to date for this section of work, but will be kept within the SWPPP.	None
Are these deficiencies, corrective measures, or requirements for additional BMPs noted in record?	×			Yes the contractor will second all inspections and required documentation.	None
Does the project require permanent (post construction) BMPs?	×			Permanent BNP is included paving and minor curb and gutter concrets work	None

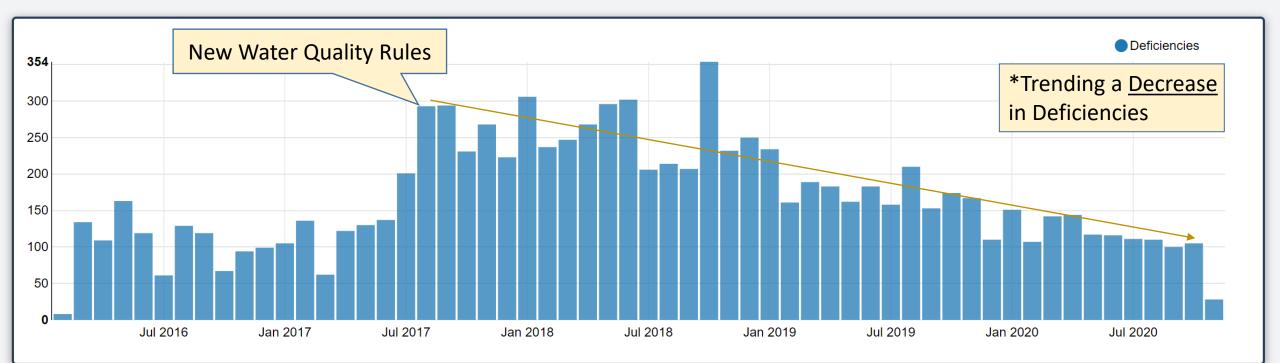
### **Top Deficiencies**





#### **DEFICIENCIES BY PERIOD**

Analytics > Deficiencies by Period





### **Analytics and Pilot Virtual Training for Contractors**

### Virtual Contractor Training: Select Pilot Group

Name 🔶	Program 🔶	# of Locations	Average Effectiveness
Contractor A	Construction	30	86.7%
Contractor B	Construction	29	66.1%
Contractor C	Construction	29	76.8%
Contractor D	Construction	28	72.1%
Contractor E	Construction	28	82.6%
Contractor F	Construction	20	80.2%
Contractor G	Construction	19	88%
Contractor H	Construction	15	62.4%
Contractor I	Construction	14	84.1%
Contractor J	Construction	14	80.3%



### **Identifying Topics for Contractor Training**

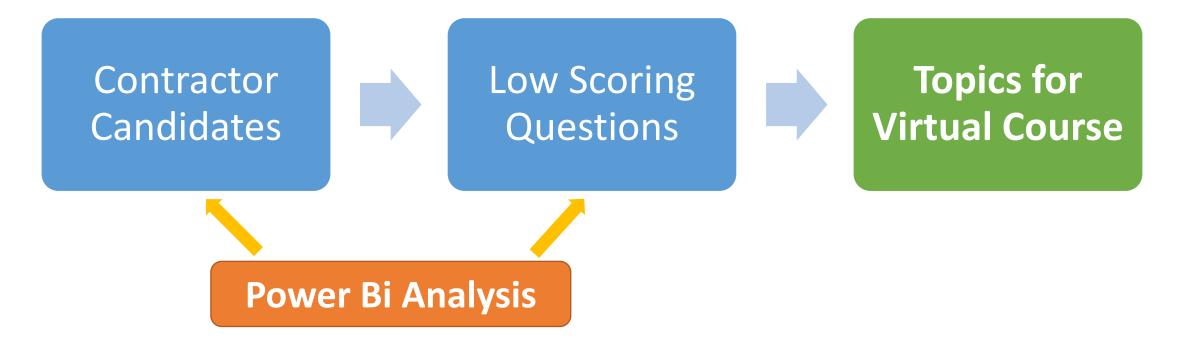
Using Training Analytics

#### **Virtual Contractor Training Pilot**

- □ Who: Field personnel of 4 selected contractors
- **What:** A focused, 1-hour training for field personnel
  - Construction Site Storm Water Compliance (BMPs)
- **Where:** Virtually / MS Teams
- **When:** October 2020
- Why: Pilot a course for selected contractors to evaluate this mode of training; Attempt to measure learning and field compliance effect

#### **Using Training Analytics**

## The Erosion and Sediment Control Plan (ESCP) Coordinator Course was used to assess:



#### **Training Analytics Results:**

#### Analysis of Scores by Quiz Question



**ESCP Coordinator Course Results for Selected Contractors** 

### **Criteria / Low Scoring Questions**

[	Criteria	Questions from ESCP Coordinator Course
$\ominus$	Distinguishing between Erosion and Sediment Control BMPs	Which one of the following options is not an Erosion Control BMP?
$\bigcirc$	Understanding DNADe wood op opdiment berriers	Filter socks, gravel bags, sandbags, and fiber rolls are examples of:
$\Theta$	Understanding BMPs used as sediment barriers	A Sediment Trap is most similar to:
$\ominus$	Recognizing pollution prevention and good housekeeping practices	What type of BMPs involve reducing sources of pollution through proper materials handling and site management procedures.
	Documentation	Where should unanticipated site changes and field changes be noted?
		Which one of the following is not a component of the ESCP?
	Fraguana, of increations	BMP Inspections for a Category 1B project should occur once every:
Frequency of inspection	riequency of inspections	Which one of the following inspection frequency requirements applies to Category 3 projects?

### **Criteria to 3PI Common Issues**

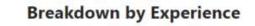
Criteria (Analytics)	3PI Issues (Field Observations)	SE-5 Fiber Rolls 3 (0.13%) 47 (2.04%)	SE-10 Storm Drain Inlet Protection	SPI Common
Distinguishing between	Street Sweeping and Vacuuming	encing 2.34%) %)		Issues
Erosion and Sediment Control BMPs	Storm Drain Inlet Protection		SE-16 Compost So 272 (11.8%)	ocks and Berms
Understanding BMPs used as sediment barriers	Compost Socks and Berms (Perimeter controls)		WM-8 Concrete	Waste Management
Recognizing pollution	Spill Prevention and Control	ant	240 (10.41%)	
prevention and good housekeeping practices	Concrete Waste Management	%) htrance/Exit 128 (5.55%) dministrative 162 (7.03%)	SE-7 Street Sweeping and Va 196 (8.5%) WM-4 Spill Prevention and Control 165 (7.16%)	acuuming

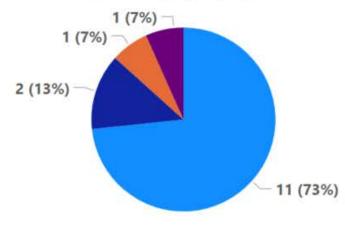


# Assessing Knowledge Before and After the Contractor Training

Pre- and Post-Surveys

#### **Pre-Survey**



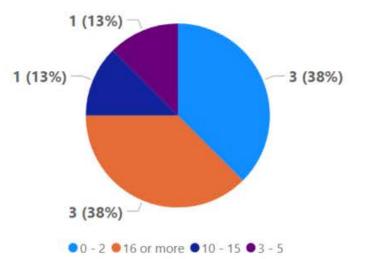


● 0 - 2 ● 10 - 15 ● 16 or more ● 3 - 5

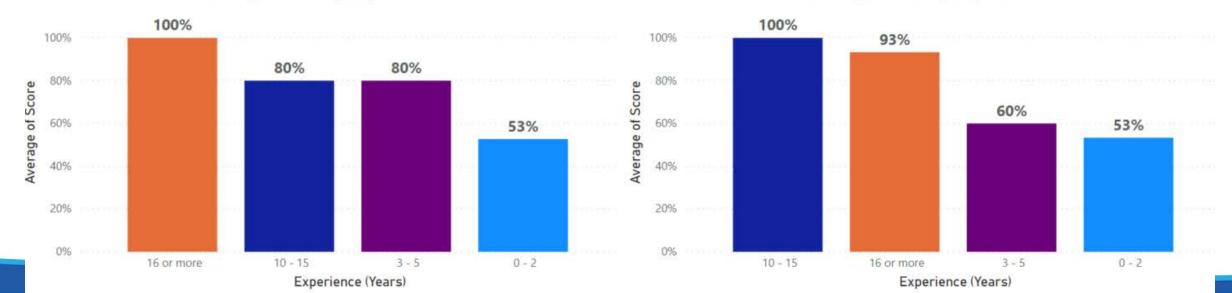
#### Average Score by Experience

**Post-Survey** 

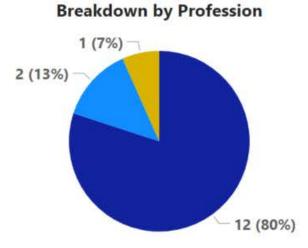
**Breakdown by Experience** 



#### **Average Score by Experience**



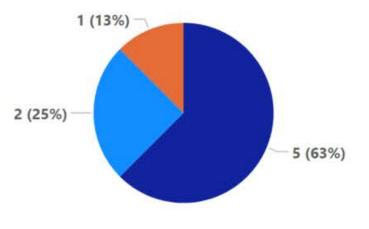
#### **Pre-Survey**



Project Engineer Other Laborer

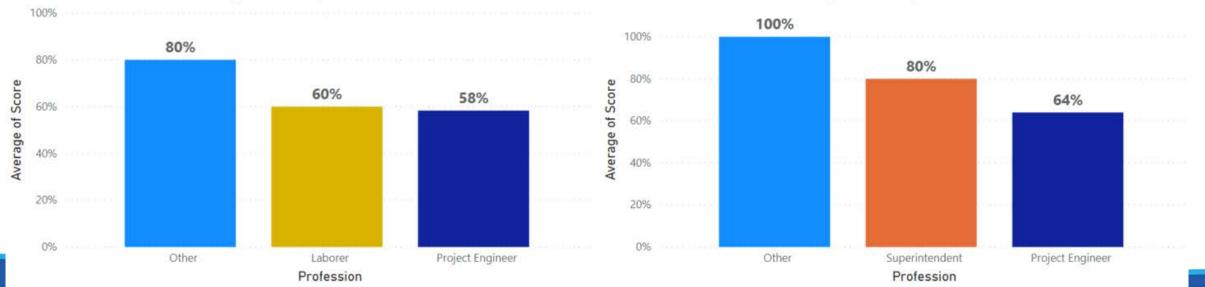
#### **Post-Survey**

#### **Breakdown by Profession**



• Project Engineer • Other • Superintendent

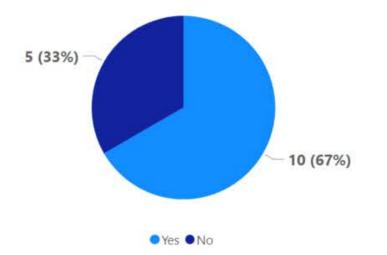
#### Average Score by Profession



#### Average Score by Profession

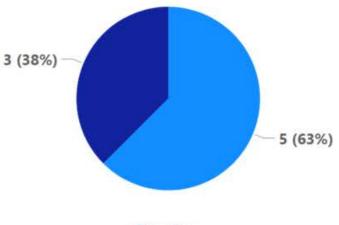
#### **Pre-Survey**

#### **Breakdown by ESCP Coordinator Status**

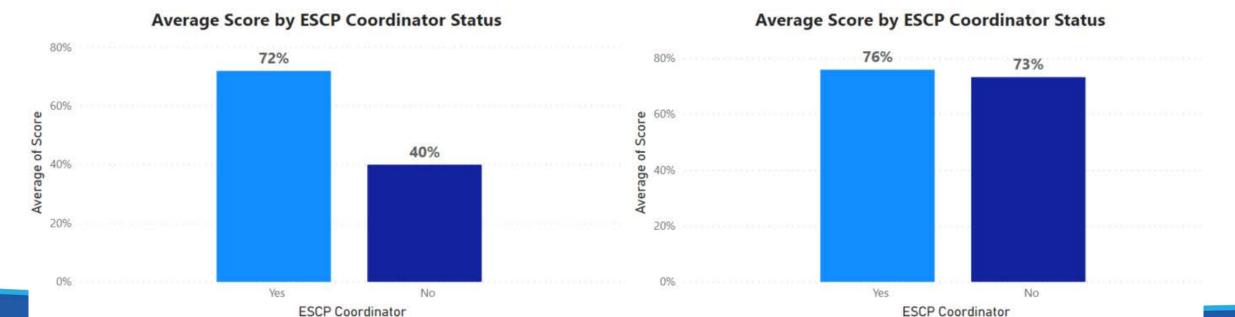


#### **Post-Survey**

#### **Breakdown by ESCP Coordinator Status**

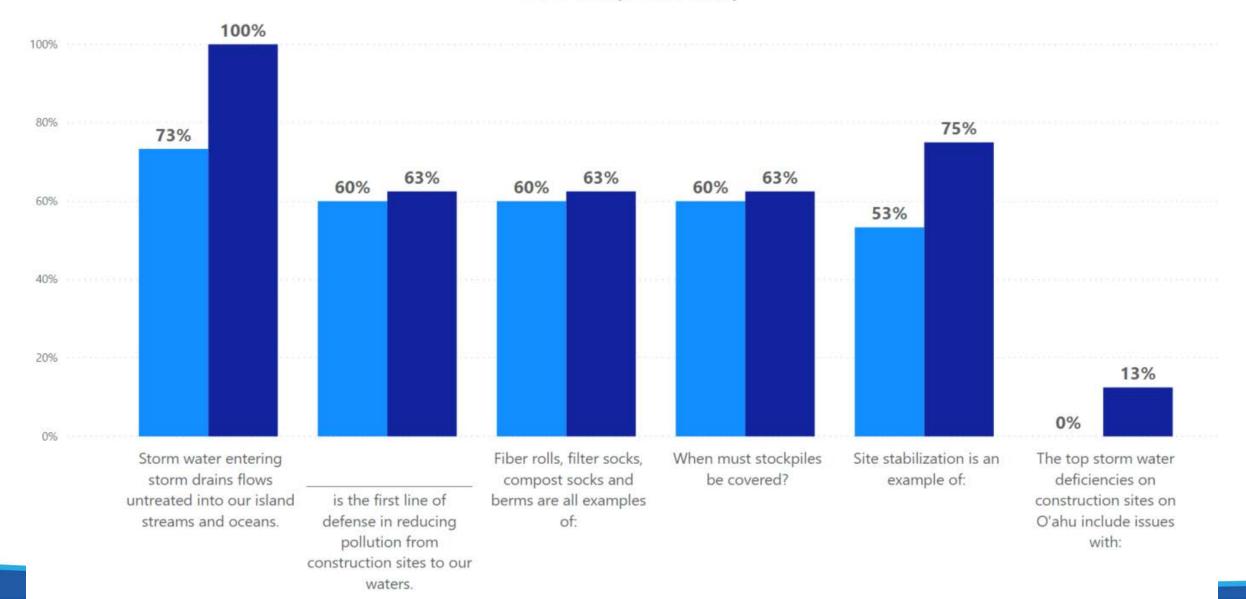


Yes
 No



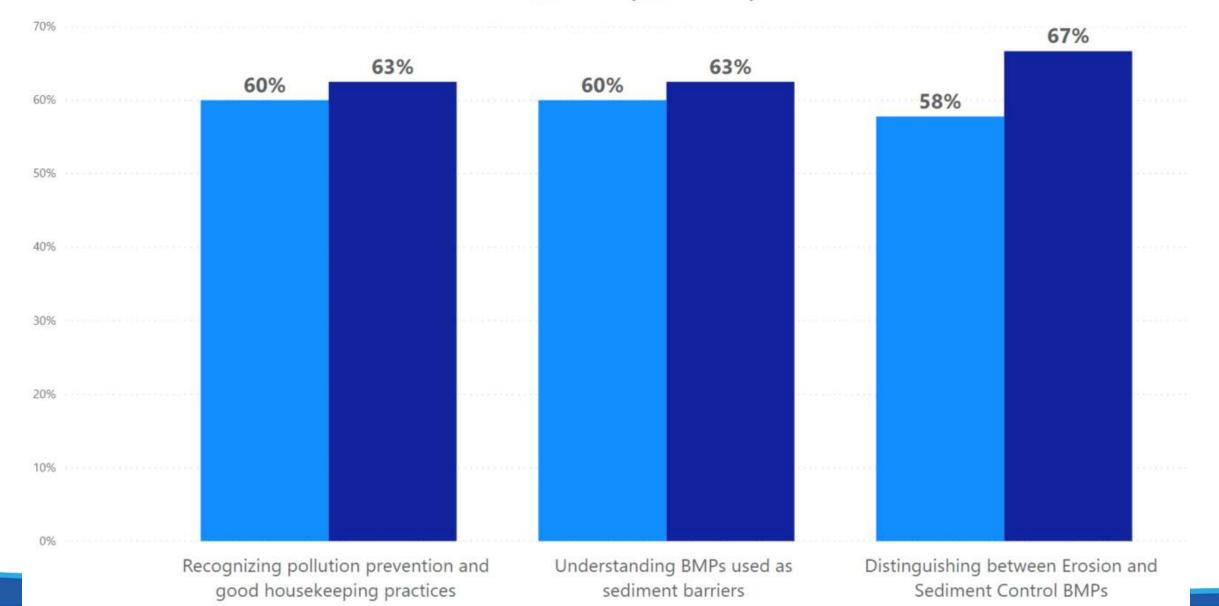
#### **Scores By Survey Question**

Pre-Survey
 Post-Survey



#### **Scores By Criteria**

Pre-Survey • Post-Survey



## Question: You're on a deadline to complete an excavation today, and you expect the work will take the entire day. You're planning on adding to your soils stockpile. The weather forecast shows there will be intense storms at 1pm. No rain is forecast for tomorrow. What would you do?

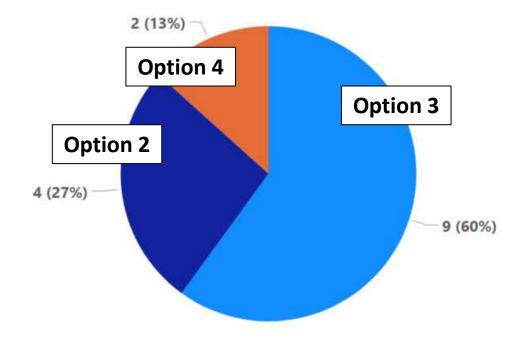
Option 1: Rush and try to complete the work this morning before the storm hits

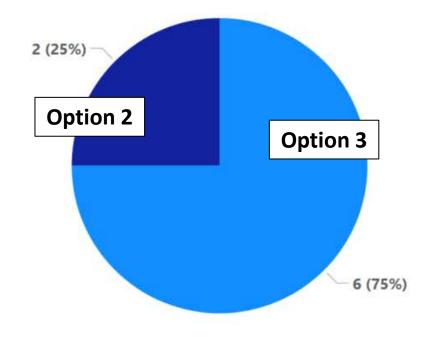
Option 2: Add extra BMPs and continue the work as planned throughout today

Option 3: Work until a reasonable time before the storm today, then cover the stockpile, and wait until conditions allow for completion of the work Option 4: Ask for an extension of time to complete the work tomorrow, or after the site dries

#### Pre-Survey Post-Survey

Work until a reasonable time before the s...





#### **Pre and Post Site Scoring: Virtual Contractor Training**

Name 🔶	Program 🔶	# of Locations	Average Effectiveness		
Contractor A	Construction	29	66.1%	→ 65.2	1
Contractor B	Construction	28	72.1% ———	→ 72.2	1
Contractor C	Construction	15	62.4%	→ 60.6	6
Contractor D	Construction	11	73.1%	→ 75.3	3

<u>NOTE:</u> Less than 1 month of data.

#### **Positive Outcomes from the Virtual Training**

- Scores improved in the Post-Survey
- Responses to situational example improved
- Good turnout from contractor companies
- Positive feedback / Well-received
- Course was recorded and can be shared
- Offered a participation certificate





## **Construction Inspection Process**

### **Third Party Inspections (3PI)**

- Inspections of permitted sites
- Identify deficiencies at the site
- Problematic sites are referred to Department of Facility Maintenance – Storm Water Quality Division (DFM-SWQ)
- Determine jurisdiction and refer to proper agency if necessary



Deficient Concrete Waste - Photo 3

Concrete slurry appears to have entered an unprotected catch basin.

#### **City Inspector**



Permitted site or unpermitted site

- If any violations are identified, jurisdiction is determined and refer to proper agency if necessary
- Enforcement actions may be implemented immediately





## **Regulatory Agencies**

## Department of Planning & Permitting (DPP)

- Onsite
- ESCP & BMPs
  - BMP installations
  - BMP maintenance
  - Documentations
- □ Some enforcement tools:
  - Stop Work Order
  - Administrative Fines
  - Daily Fines





### Department of Facility Maintenance – Storm Water Quality Division (DFM-SWQ)

- Offsite
- Discharges
  - Any discharge entering the City's MS4
  - Concrete waste
  - Tracking
  - Pollutant runoff
- Types of enforcements
  - Letter of Warning
  - Notice of Violation
  - Notice of Order







## **DFM-SWQ's Enforcement Process**

#### **Enforcement Process & Policy**

### ROH 14-12.23: Environmental Quality Control - Violation

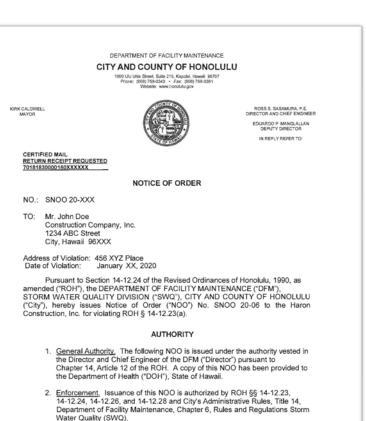
### Notice Of Violation

- First violation
- Allows offender(s) to correct issue

### Notice Of Order

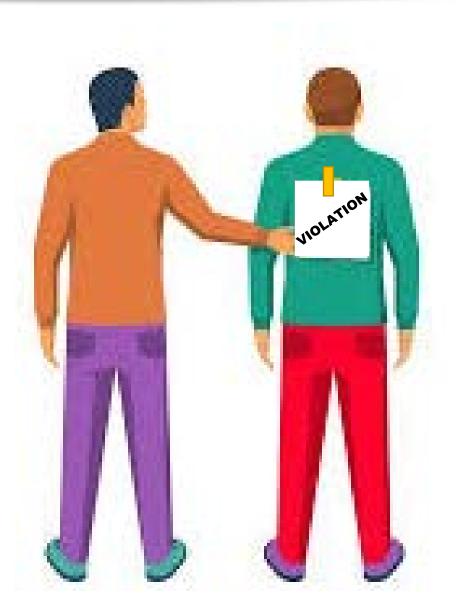
- Repeat offenders
- Fines

KIRK CALDWEI MAYOR	DEPARTMENT OF FACILITY MAINTENANCE CITY AND COUNTY OF HONOLUDU DOUGLIA UNA STORE, Sub 215, Kupada, Humai (1977) Process (1979) 786-333 - Fax. (1900) 786-333 Website: www.brokada.gov RCSDS & SARAMURA, P.E. DEUGRO P. MANGA ALLAN DBUTTY DARGETOR	×
RETUR	TED MAIL N RECEIPT REQUESTED 30000160XXXXXX	
	NOTICE OF VIOLATION AND ORDER	
NO.:	SNOV 20-XXX	
TO:	Mr. John Doe 1234 ABC Street City, Hawaii 96XXX	
	FINDING OF VIOLATION	
at 450 DFM disch of Ho	On June 9, 2020, the Department of Facility Maintenance ("DFM") conducted an ction of the real property described under Tax Map Key No. 1-1-XXX:XXX located 5 XYZ Place, Honolulu, Hawaii ("Property"). Based on the foregoing investigation, has determined that concrete sediment (pollutant) was discharged or caused to be arged from the Property onto XYZ Place. XYZ Place is part of the City and County nolulu's ("City's") Municipal Separate Storm Sewer System ("MS4") that arges into State waters at Manaiki (Moanalua) Stream.	
	The City's MS4 is the system for the conveyance of storm water including roads treets with drainage systems, catch basins, curbs, gutters, ditches, man-made tels, or storm drains owned by the City.	
	Pollutant discharges to the City's MS4 is a violation of:	
disch State	Section 14-12.23(a) of the Revised Ordinances of Honolulu, 1990, as amended 4"), provides that it is unlawful for any person to discharge or cause to be arged any pollutant into any drainage facility which causes a pollution problem in waters, or causes a violation of any provision of the City NPDES permit or the quality standards of the State of Hawaii.	



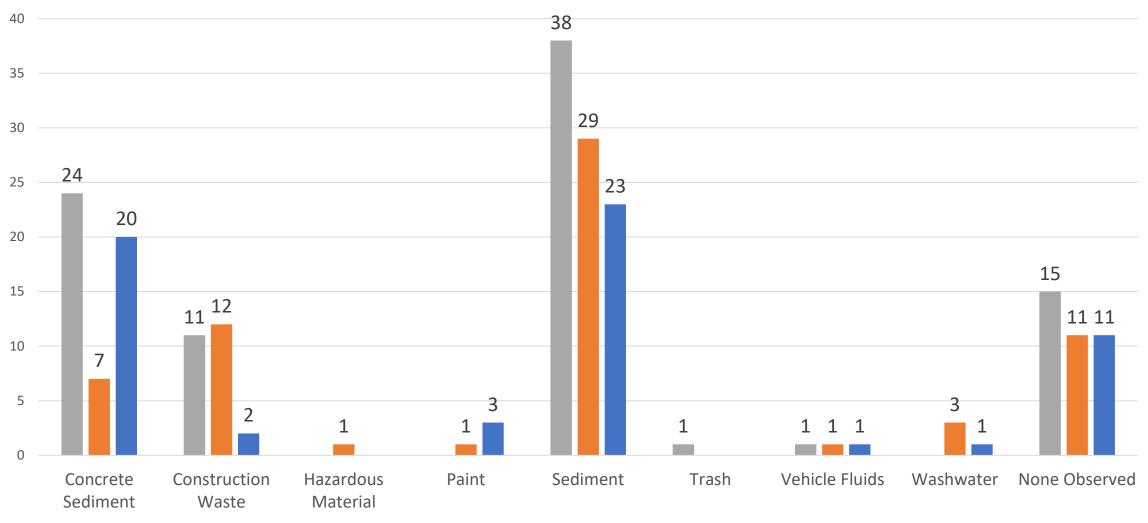
#### **Enforcement Process & Policy**

- Issue violation to multiple people
  - Property Owner(s)
  - Property Manager
  - Business
  - Contractor
  - Subcontractor
- □ Violations stay with person and/or property
  - Property Hypothetical
  - Person or Business Hypothetical



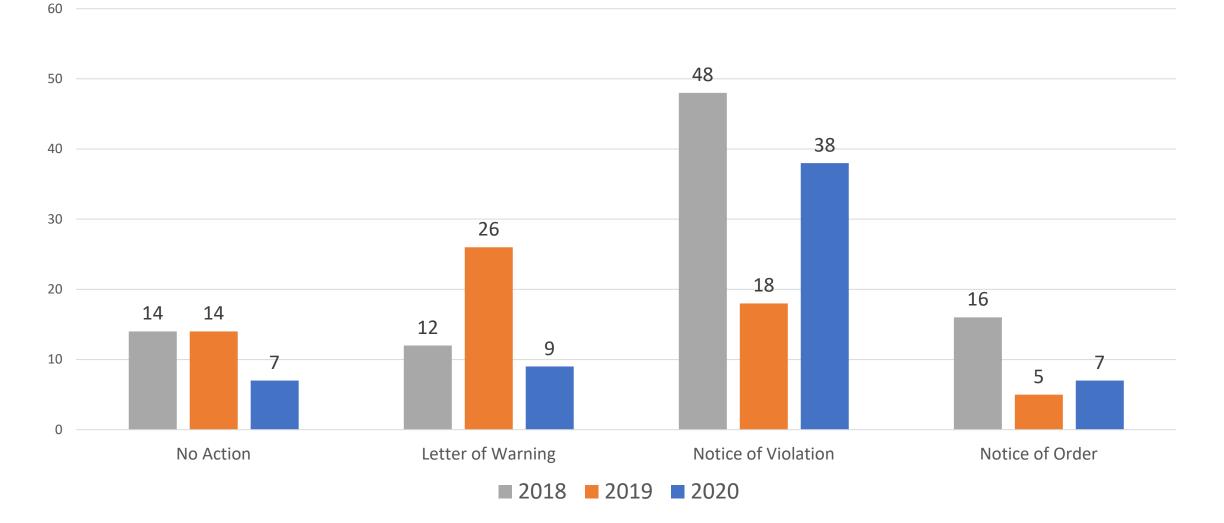
City and County of Honolulu Presentation to 2020 DOT Protect Our Water Conference



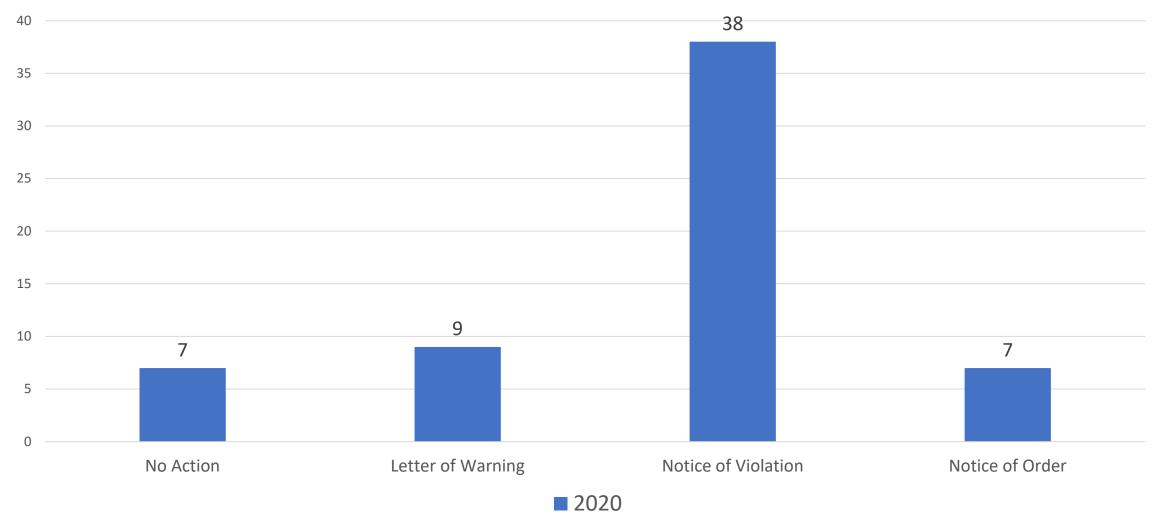


2018 2019 2020

#### **Enforcement Actions**



#### 2020 Enforcement Actions





## Conclusion

### Conclusion



- Continue to analyze inspection data
- Increase training opportunities, if successful
- Adjust training strategies, if necessary



- □ If no change in data:
  - Re-evaluate training
  - Evaluate/adjust process to increase enforcement actions



### **Resources**

### Storm Water Quality Division Website:

www.cleanwaterhonolulu.com

CLEAN WATER	Water, Quality		
Facility Maintenance Home			40000000000
Storm Water Quality Division			7 - 47
About Us			
Rules Relating to Water Quality			
Learning Center			
Get Involved	Construction Site Runoff		
Calendar	Learn more about good construction pra	ictices.	
Photo Gallery	Welcome		
Resource Library	where the first day in strategy and a strategy and	ters the City's drainage system of	directly impacts the health of
Media Library	our island because these water	s flow untreated to our natural w	vaterways and ocean.
FAQ & Glossary		(SWQ) mission is to empower a quality in order to protect public	
Forms	SWQ works with City departme foster shared responsibility for	ents as well as public businesse protection of our wai (water).	s, agencies, and individuals
News & Public Notices			
Contact Us			
Department of Facility Maintenance	Get involved	Learning Center	Calendar
Ross S. Sasamura, P.E., Director and Chief Engineer Eduardo P. Manglallan, Deputy	News	Rules Relating	to Water Quality

#### **Resources**

### Learning Center:

#### https://www.honolulu.gov/dfmswq/learningctr.html

Facility Maintenance Home	Keiki	Teachers	Homeowner	Industry/Retail	Construction	
Storm Water Quality Division	Const	ruction 0	Doct Conc	trutetion		
About Us	Const	ruction 8	Post Cons	uruction		
Rules Relating to Water Quality	- all		THE			
Learning Center	and the second s					
Get Involved	1					
Calendar	-61					
Photo Gallery				on pollution prevention	, advising them on prac	
Resource Library	-	ting to ensure cor				
Media Library	In accordance with the City's NPDES permit, the City regularly inspects construction and post o addition, if a complaint is filed or there is a community concern, the City must inspect the site an					
FAQ & Glossary		ound discharging up to \$25,000.	pollution or wastewa	ter into the storm drain s	ystem may be issued a	
Forms	As a business in the State of Hawaii, you can reduce storm water pollution in work activities. Cli					
News & Public Notices	1100		nd tips to keep our sta	ate beautiful:		
Contact Us	Generali	information water Overview E	Rochure			
	1	CONTRACTOR AND	ent Program Plan			
epartment of Facility Maintenance			olulu Storm Drain Sy	stem		
loss S. Sasamura, P.E., Director and	• Storm	Water Issue				
hief Engineer	<u>City's</u>	Rules Relating to	Water Quality			
duardo P. Manglallan, Deputy	Construc	tion Industry				
Director					and the second second	
000 Uluohia Street, Suite 215				Tip Card 2   Chinese   Ch	nuukese (llocano   Kore	
apolei, Hawaii 96707			Tip Card   Samoan   ]			
Phone: (808) 768-3343		ng Painting (Tip C	inese   Chuukese   IId	Juanu)		
ax: (808) 768-3381			Sites – Quick Refere	nce Booklet		
		Manual for Constr		nee boonet		
	the state of the second state	Sector of the sector of the sector	and the second sec	nce Training ( <u>Training   L</u>	ogin Instructions)	



#### CITY AND COUNTY OF HONOLULU STORM WATER BEST MANAGEMENT PRACTICE MANUAL

#### CONSTRUCTION

FINAL

November 2011

By: City and County of Honolulu Department of Environmental Services Kapolei, Hawaii



#### CONSTRUCTION FOR HOMEOWNERS





Be AWARE, take ACTION, report ACTIVITIES that adversely affect streams, drainage channels and the

#### BE AWARE:

Homeowners are respons ble for all activity that occurs on the property, including construction projects. Citations and viola improper management of potential pollutants, such as sedim concrete residue, or construction debris can be given to bot property owner and the contractor, or just the property owner these pollutants get picked up by storm water they enter the system and are deposited directly into streams and the ocea they can endanger coral reefs and aquatic plants by cloudin waters and blocking the sunlight needed to survive. TAKE ACTION:

 Discuss with your contractor how they will prevent constru debris, concrete, and soil sediment from leaving your prop

- Sediment should not go into a neighboring property, into a or onto the street.
- · Have your contractor store all materials on your property.
- Do not stockpile materials on sidewalks and roadways. If the the City right-of-way is necessary, a street usage permit is For more information about this permit, visit wwwf.honolulu.gov/dts/usage/street.htm.
- Contain stockpiles using sediment barriers or tarp covers train from eroding the stockpile and carrying away sediment
- Make sure your contractor keeps work areas clean by swe waste and debris daily, especially the roadway and sidewa adjacent to your construction site.
- Store paint, solvents, and other chemicals in original conta under covered areas with containment to catch any leaks
- Encourage your contractor to recycle construction waste t minimize trash that goes to the landfills.

REPORT ACTIVITIES: City's Environmental Concern Line at 768-3300 or visit www.cleanwaterhonolulu.com



4/2015



#### Be an Everyday Clean Water Hero!

Be AWARE, take ACTION, report ACTIVITIES that adversely affect streams, drainage channels and the ocean.

#### BE AWARE:

Homeowners are responsible for all activity that occurs on their property, including construction projects. Citations and violations for improper management of potential pollutants, such as sediment, concrete residue, or construction debris can be given to both the property owner and the contractor, or just the property owner. When these pollutants get picked up by storm water they enter the drainage system and are deposited directly into streams and the occas, where they can endanger coral reefs and aquatic plants by clouding the waters and blocking the sunight needed to survive.

#### TAKE ACTION:

 Discuss with your contractor how they will prevent construction debris, concrete, and soil sediment from leaving your property.

 Sediment should not go into a neighboring property, into a stream, or onto the street.

Have your contractor store all materials on your property.

 Do not stockpile materials on sidewalks and roadways. If the use of the City right-of-way is necessary, a street usage permit is required. For more information about this permit, visit wwwf.honolulu.gov/dts/usage/street.htm.

 Contain stockpiles using sediment barriers or tarp covers to prevent rain from eroding the stockpile and carrying away sediment.

 Make sure your contractor keeps work areas clean by sweeping up waste and debris daily, especially the roadway and sidewalk adjacent to your construction site.

 Store paint, solvents, and other chemicals in original containers and under covered areas with containment to catch any leaks or spills.

 Encourage your contractor to recycle construction waste to minimize trash that goes to the landfills.

#### REPORT ACTIVITIES:

City's Environmental Concern Line at 768-3300 or visit www.cleanwaterhonolulu.com

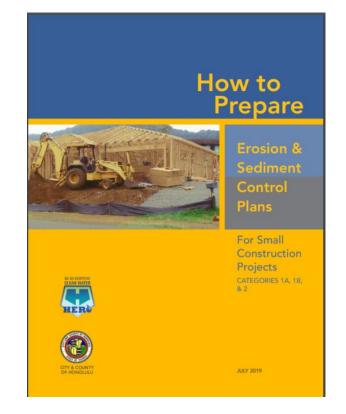


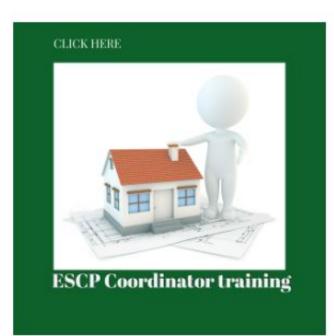


#### **Resources**

### □ Rules Relating to Water Quality:

https://www.honolulu.gov/dfmswq/rules-relating-to-water-quality.html









# **Questions?**