









# Stormwater Quality Management Committee May 11, 2021



 Action to accept a presentation on the Coanda trash screen technology (For possible action)

Item 5.

# WATER SHARK SYSTEMS, LLC

Taking a bite out of the storm water problem.

Steve Esmond, PE Rene Gamero, QISP

May 11, 2021



# WATER SHARK SYSTEMS, LLC

Clean water solutions company

We deliver high value and effective water treatment that assists companies in cleaning their storm water prior to discharge.

Las Vegas Office 4056 S Spitze Dr. Las Vegas, NV 89103 866-605-1190 Anaheim Office 1185 North Van Horne Way Anaheim, CA 92806 562-431-4300



**Coanda Certifications FULL CAPTURE CERTIFICATION California Water Board for the Statewide Stormwater Program** LA Regional Board **SF** Regional Board **SD** Regional Boar Specific approvals in other state, county and local jurisdictions. **GROSS SOLIDS REMOVAL DEVICE (GSRD).** Caltrans NATIONAL BUILDING CODES



#### **Coanda Certifications**



(213) 576-6600 • FAX (213) 576-6640 http://www.waterboards.ca.gov/losangeles



nund G. Brown Jr Governor

November 15, 2011

Gary Hildebrand, Assitant Deputy Director Watershed Management Division Department of Public Works, Country of Los Angeles 900 S. Fremont Ave. Alhambra, CA 910803

CERTIFICATION OF THE COANDA SCREENS AS A FULL-CAPTURE DEVICE UNDER PART 7.1 TRASH TMDL OF THE LOS ANGELES COUNTY MUNICIPAL STORM WATER AND URBAN RUNOFF DISCHARGES PERMIT (Order No. 01-132, NPDES Permit No. CAS004001)

#### Dear Mr. Hildebrand:

We have reviewed your letter of September 22, 2011, and the accompanying report entitled, *Technical Report Coanda Screen Design Application for Full Capture TMDL Compliance, May 2011, requesting certification for the Coanda Screens* (by Coanda, Inc.) as full-capture device under Part 7.1 section B(1)(a)1 of the Trash Total Maximum Daily Load (TMDL) of the Los Angeles County Municipal Storm Water and Urban Runoff Discharges Permit (Order No. 01-182, as amended by Order No. R4-2009-0130).

Pursuant to Part 7.1, section B(1)(a)1 of Order No. 01-182, the undersigned hereby certify that Coanda Screens are deemed a full-capture device under the Trash TMDL.

Regional Water Quality Control Board, Los Angeles Region (Regional Board) staff review of the technical report and video show that the Coanda Screens satisfy the three criteria for a full-easture device:

- 1. Devices that traps all particles retained by a 5-mm mesh screens.
- Design treatment capacity of not less than the peak flow resulting from a one-year, one-hour storm in the sub-drainage area, and
- Essential technical information provided for adequate evaluation of the said full capture device.

In addition, Coanda Screens are comparable with previously certified full capture devices such as the connector pipe screens and vertical and horizontal capture screen inserts.

| Gary Hildebrand                 |  |
|---------------------------------|--|
| Certification of Coanda Screens |  |

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The Regional Board shall review and consider performance data on a continuing basis of all full-capture devices.

In the event that data demonstrate these devices are not performing to the full-capture standard set forth by the Trash TMDL, the Regional Board Executive Officer reserves the right and ability to rescind the certification for subsequent installations that are determined to be inadequate.

If you have any questions, please call Carlos D. Santos at (213) 620-2093.

Sincerely,

Samuel Unger

Samuel Unger, P.E. Executive Officer

cc: Bruce Fujimoto, Division of Water Quality, State Water Board Jennifer Fordyce, Office of Chief Counsel, State Water Board Shahram Kharaghani, City of Los Angeles, WPD, Bu. of Sanitation

Letter addressed to LA County Public Works from the CA Regional Water Quality Control Board. (waterboards.ca.gov)



## WORLDWIDE ADOPTION







HENRI COANDA 1886-1972

ROMANIAN INVENTOR

AERODYNAMICS PIONEER

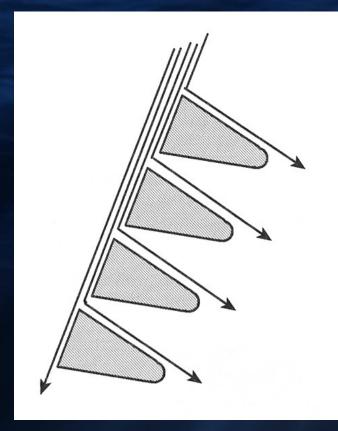
BUILDER OF WORLD'S FIRST JET POWERED AIRCRAFT Inventor of the Coanda Effect: "A moving stream of fluid in contact with a curved surface will tend to follow the curvature of the surface rather than continue traveling in a straight line."

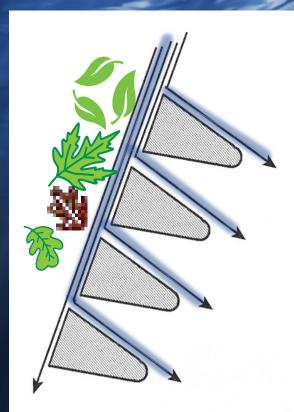
US Patent No. 2,052,869 "Device for Deflecting a Stream of Elastic Fluid Projected into an Elastic Fluid" by Henri Coanda, Sept. 1, 1936





#### HOW THE COANDA EFFECT WORKS TILTED WEDGEWIRE SCREEN TECHNOLOGY







# Connector Pipe Screens (CPS)







# **CPS MAINTENANCE ISSUES**



Debris and water compete for the same openings, plugging the holes. These are not self-cleaning.



## AUTOMATIC RETRACTABLE SCREENS (ARS) DON'T ALWAYS AUTOMATICALLY RETRACT



Labor-intensive cleaning always required



#### Advantages of Coanda Screens

"These screens have large flow capacities and are hydraulically self-cleaning without moving parts, so they require minimal maintenance." \*

\* "Design Guidance for Coanda-Effect Screens," Report No. R-03-03, U.S. Department of the Interior, Bureau of Reclamation Technical Service Center, Water Resources Services, Denver, Colorado, July 2003.



#### NO TRASH ACCUMULATION ON STREET TRASH REMOVAL MADE EASY





# COANDA SCREEN





# CURB INLET INSTALLATION





#### CHANNEL SCREENS





#### **Features:**

- Placed either in-line or off-line
- Engineered design ~ 100 cfs
- Screens & frames ~ \$30k
- TPC ~ \$150k





#### COANDA CHANNEL SCREEN





# COANDA CHANNEL SCREEN AMAFCA





1,200 cfs Treatment Capacity

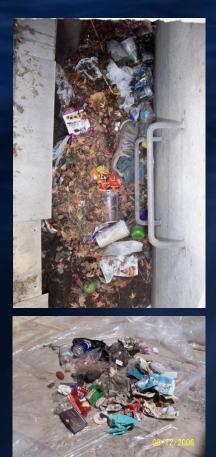


#### COANDA CHANNEL SCREEN SANTA ANA RIVER





# URBAN TRASH (DOWNTOWN LA)







### URBAN TRASH (DOWNTOWN LA)

|   | Descriptio<br>n                             | Sieve<br>Size,<br>mm | Wt,<br>% | Vol, % | Density,<br>pcf |
|---|---|----------------------|----------|--------|-----------------|
| 0 | Sediment<br>& grass<br>seeds                | 1.0                  | 37       | 8      | 44              |
|   | Mulch,<br>grass, fine<br>bark               | 5.0                  | 22       | 12     | 18              |
|   | Leaves,<br>small<br>sticks                  |                      | 26       | 42     | 6               |
|   | Trash:<br>paper,<br>plastics,<br>cans, etc. |                      | 15       | 38     | 4               |



# COANDA LIFE CYCLE

According to:

- LA County more than 10 years
- USBR more than 20 years
- Coanda 30 to 40 years



#### COST COMPARISON

| Structural BMP                         | Cost to Remove 1 lb. of<br>TSS |
|--|--------------------------------|
| Street Sweeping <sup>1</sup>           | \$ 0.11 + disposal             |
| Coanda                                 | <b>\$ 0.48</b>                 |
| Detention Basin <sup>1</sup>           | \$ 0.63                        |
| Sand Filters <sup>1</sup>              | \$ 4.28                        |
| Infiltration Basin <sup>1</sup>        | \$ 4.56                        |
| Catch Basin Insert <sup>1</sup>        | \$ 4.65                        |
| Hydrodynamic<br>Separator <sup>1</sup> | \$ 5.32                        |

<sup>1</sup> Karen Nichols and Hilary Ahrens, "What's the Cost to Remove One Pound of Sediment From Stormwater?" StormCon 2011



### Caltrans VS1 I-405 (Clog and Labor Intensive)





#### Nets & Booms (Clog and Labor Intensive)









# SUMMARY

- Water Sharks has designing treatment systems since 2005.
- COANDA has over 30 years of experience in storm water engineering and treatment.
- Custom designed to treat site specific water issues like trash, sediment, metals, nutrients, COD, bacteria, and more.



We work on solutions with you together.



# **QUESTIONS?**

Steven E. Esmond, P.E. C: (714) 272-1997 sesmond@coanda.com Rene Gamero, QISP C: (213) 300-1107 rgamero@watersharks.com







