# Oil Contaminated Flood Waters 2006

# The Real World has been My Laboratory

# History: Open-Cell Tech Used to Fingerprint Pollutants

**Tested to Identify Oil that Leaked into Fresh Water Stream Outside Bermuda Utility**

**Customers provided feedback**

**Hydrocarbons Detected and *Metals***

# Open-Cell Eelgrass Deployed Mayflower, AR

**Pegasus Pipeline Spilled Oil AND CHEMICALS – Open-Cell Tech Captured Both**

**"Positive Tests" for *Benzene* and other chemicals**

**Open-Cell Eelgrass Deployed Across River to Detect & Absorb Oil and Solvents**

# History: Gowanus Canal, Brooklyn, NY

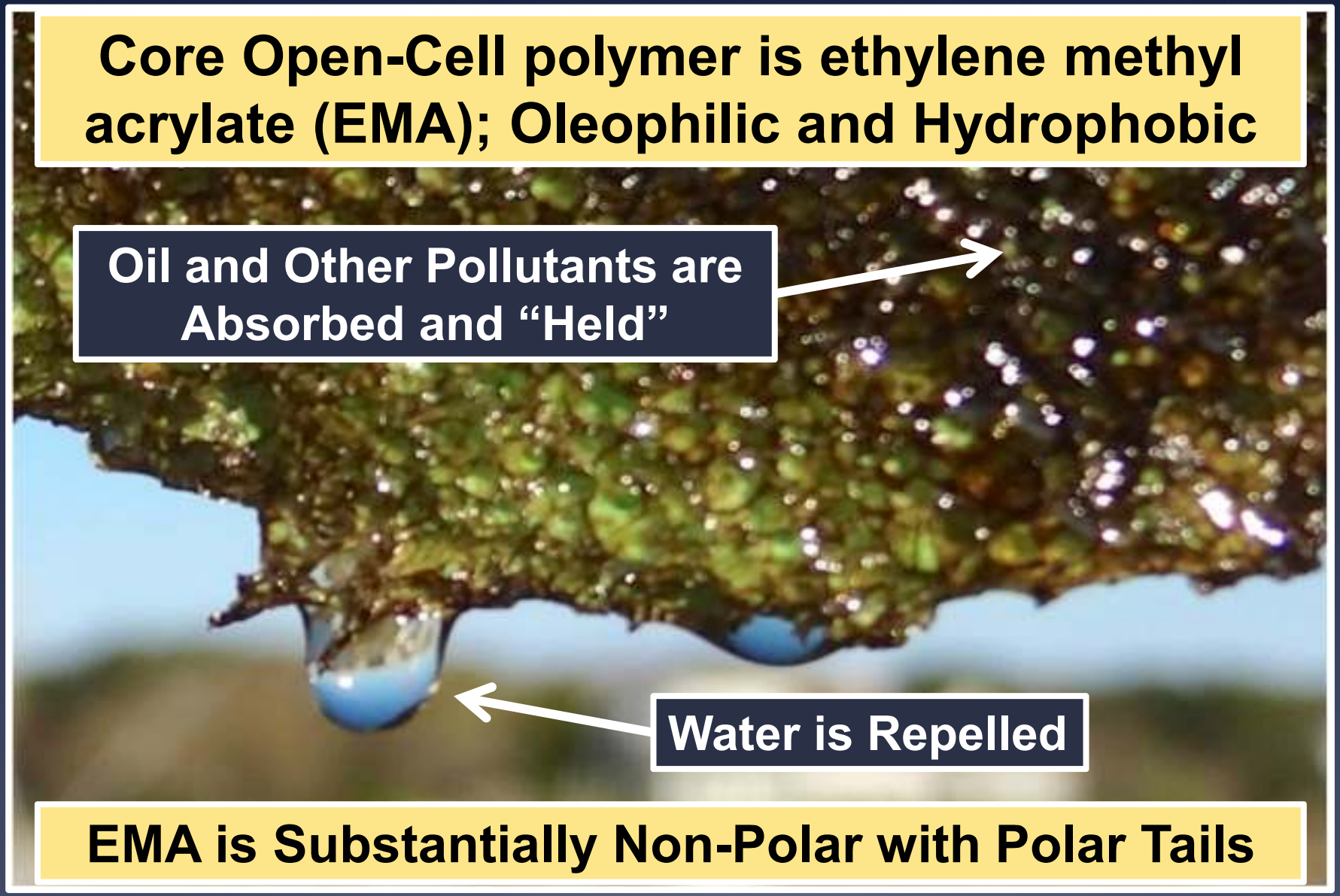
Analytical Chemists Laboratory, LLC.

**SVOA MS**

| | | | | |
|---|---|---|---|---|
| Hexachlorocyclopentadiene | <14100 | 14100 | ug/kg dry | VM |
| Hexachloroethane | | | | |
| **Indeno (1,2,3-cd) pyr** | | | | |
| Isophorone | | | | |
| **2-Methylnaphthalene** | | | | |
| 2-Methylphenol | <7040 | 7040 | " | VM |
| 3 & 4-Methylphenol | <7040 | 7040 | " | VM |
| Naphthalene | <7040 | 7040 | " | VM |
| 2-Nitroaniline | <7040 | 7040 | " | VM |
| 4-Nitroaniline | <7040 | 7040 | " | VM |
| 3-Nitroaniline | <7040 | 7040 | " | VM |
| Nitrobenzene | <7040 | 7040 | " | VM |
| 4-Nitrophenol | <8450 | 8450 | " | VM |
| 2-Nitrophenol | <7040 | 7040 | " | VM |
| N-Nitrosodiphenylamine | <7040 | 7040 | " | |
| N-Nitrosodi-n-propylamine | <7040 | 7040 | " | |
| Pentachlorophenol | <8450 | 8450 | " | |
| **Phenanthrene** | **87100** | 7040 | " | |
| Phenol | <7040 | 7040 | " | |
| **Pyrene** | **114000** | 7040 | " | |
| 1,2,4-Trichlorobenzene | <7040 | 7040 | " | |
| cis-1,3-Dichloropropene | | <18.3 | | 18.3 |
| **Ethylbenzene** | | **24.0** | | 18.3 |
| Hexachlorobutadiene | | <18.3 | | 18.3 |
| Isopropylbenzene | | <36.7 | | 36.7 |
| **4-Isopropyltoluene** | | **42.4** | | 18.3 |
| Methyl-tert-Butyl Ether | | <18.3 | | 18.3 |

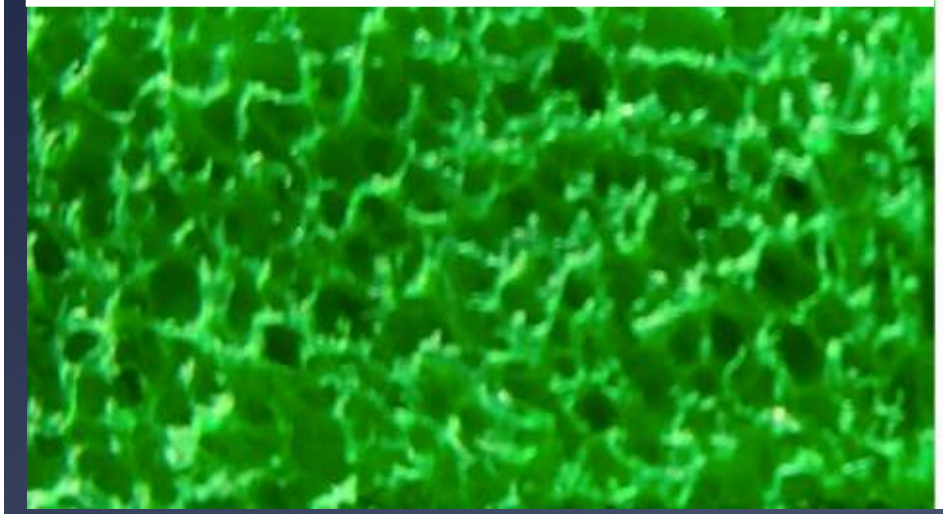
**Hydrocarbons, VOCs and Metals**

# How Open-Cell Tech Works (Magnification Below)



# Elastomeric Open-Cell Technology

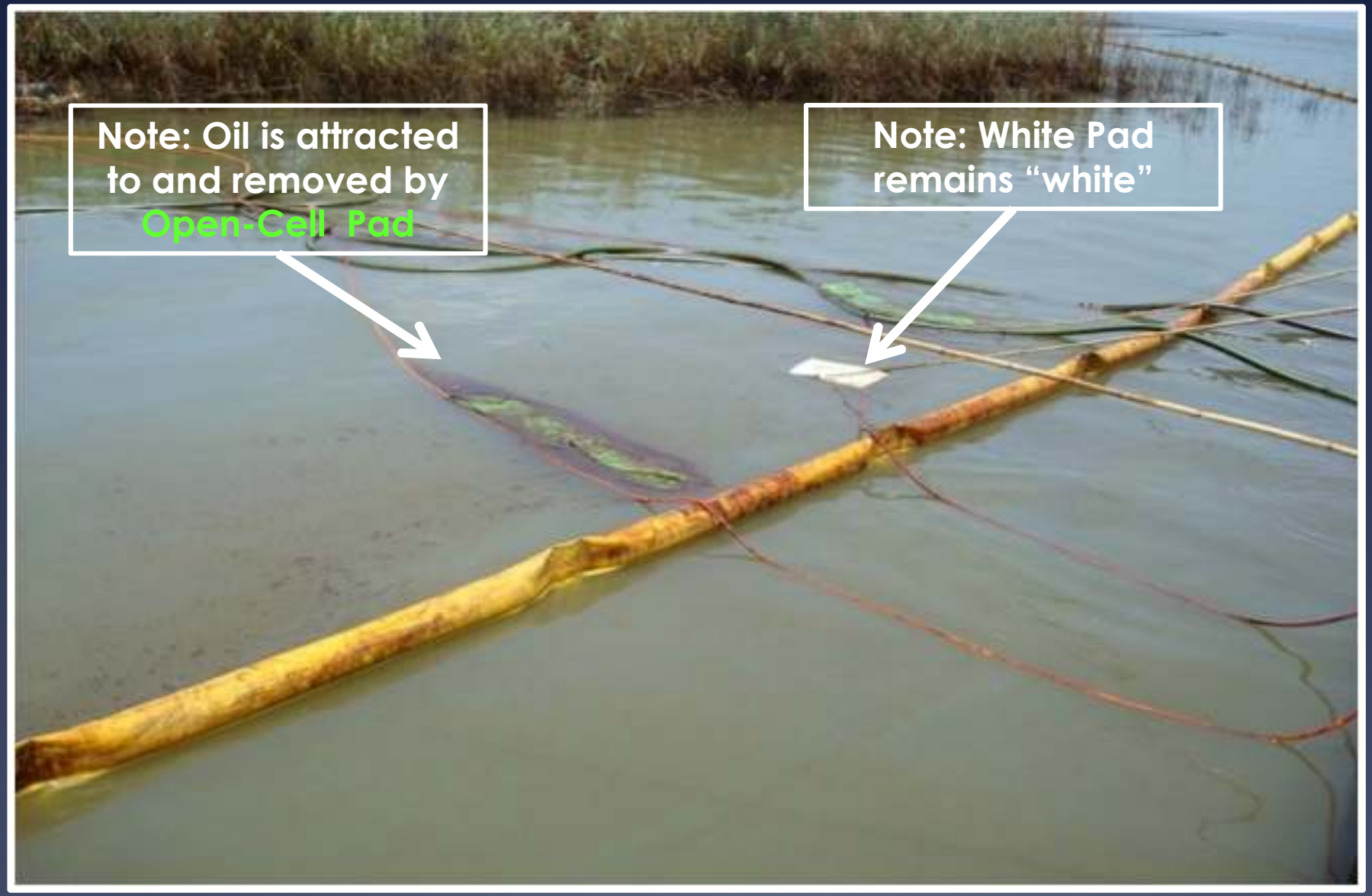
**Open Cells Have Greater Surface Area (Magnification)**



**Open-Cell Tech Absorbs and Adsorbs**

**Open Cells Increase Capacity to Capture Oil and Other Pollutants**

# Open-Cell Mega-Pad used by BP to clean up the Gulf of Mexico around containment booms



*DATE: September 1, 2010 9:42:04 AM CDT*

# Specialized foam takes on new role in Gulf cleanup

A polyolefin foam used in the medical and construction fields has taken on a new role as a powerful tool in BP's Gulf response efforts to remove oil from the water, shorelines, and marshes. The foam, called Opflex, allows water to flow through, but attracts and traps oil. It can be made in various shapes, including in pads to mop up oil from coastal marshes and in sausage-like rolls for deployment as offshore booms.

Scott Smith, chief executive officer of Cellect Plastics, the maker of Opflex, sees great potential for the product in oil cleanup and other water treatment applications that go beyond its original uses in the medical and construction fields.

"The advantage of Opflex is that it's buoyant open-cell foam that repels water while absorbing oil," says Smith. "It is 70% lighter than conventional booms, costs a fraction of conventional material, is biodegradable, and is highly efficient — absorbing 60 pounds of oil with a 12-foot boom."

"It's better than good," says Larry Hooper, who formerly served as captain of a charter fishing boat and now is providing BP with logistics support. "I've used it out in the ocean and the old-type booms can't come close to matching its performance."

Ken Rice has used Opflex-based pads in cleanup operations in the North Pass marshes of South Louisiana. "People love it once they get their hands on it," he says.

Another key feature is reusability. "Unlike conventional pads, which are considered hazardous waste after absorbing oil and must be disposed of in accordance with various government regulations, Opflex can be reused up to 100 times," says David Kinnaird, who led the first BP response team to evaluate the material.

Various methods for extracting the oil from the foam include using centrifuges or wringers similar to those on old-fashioned washing machines. After Opflex has collected the oil, the foam can be wrung out into a suitable container.

# BP – Gulf Update - Continued

Early in the Gulf response, Kinnaird was impressed by a product demonstration of Opflex and contacted Lou Weltzer, who was stationed in the Critical Resources Unit in New Orleans with responsibility for evaluating cleanup materials. After receiving his own product demonstration, Weltzer placed an order for a truckload of the material. Subsequent orders from BP total about two million square feet. Weltzer also began contacting associates at other locations to spread awareness of Opflex's capabilities. Since the experience with BP, Smith has received an order from the Chinese government to assist in the Dalian Oil Port cleanup, as well as a range of other cleanup operations throughout the country, which continues to solidify Opflex's role as a new and effective method for oil spill cleanup.

# Open-Cell Eelgrass Successfully Deployed by BP America in 2010

# USA Today Article 2010 – Business Section Cover

USA TODAY

## After BP oil spill, thousands of ideas poured in for cleanup

Updated 11/15/2010 3:25 PM

By Julie Schmit, USA TODAY

Scott Smith of Cellect Technologies shows his oil-absorbing Opflex foam.

Smith's company, the Massachusetts-based Cellect Technologies, makes a foam, Opflex, that repels water but absorbs oil. Previously used in the medical, construction and other fields, Smith brought it to the Gulf and "spent days living with fishermen" trying to get his foam into the water.

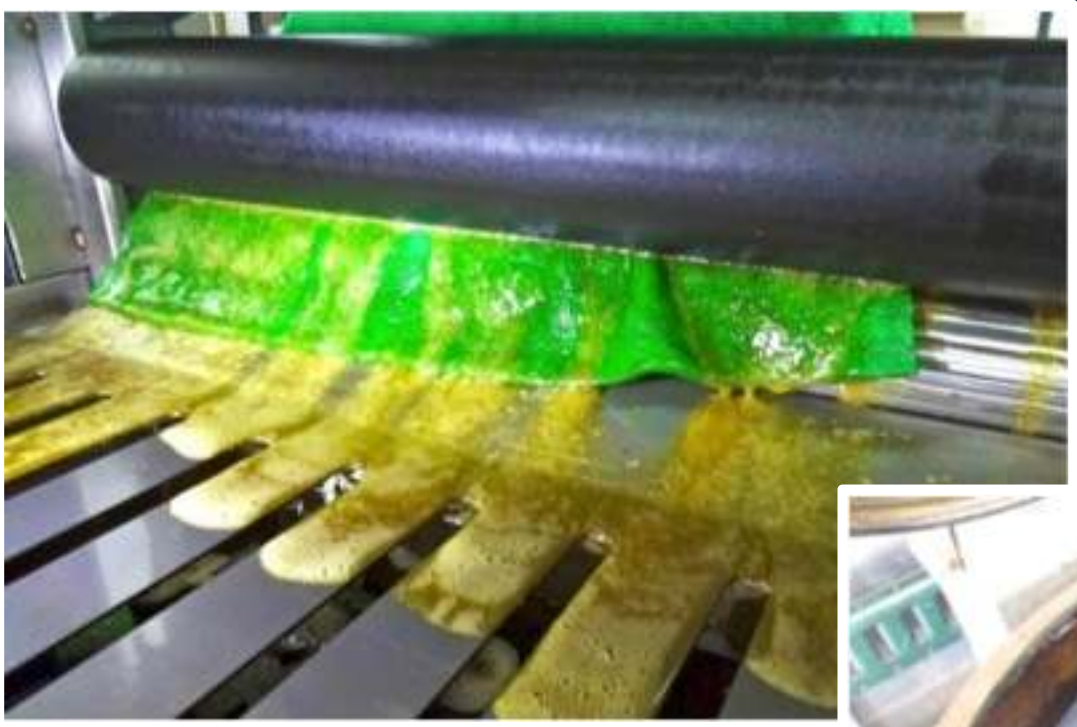
All sorbent-boom manufacturers claim that their products repel water. But sooner or later, they don't, Kinnaird says. BP's tests found that Opflex went weeks without absorbing water. When oiled, it could be wrung out and reused. It's also biodegradable, Kinnaird says. Traditional absorbent boom often ends up in landfills as hazardous waste.

"This was completely different from anything I'd seen," Kinnaird says. Through the spill, BP bought 2 million square feet of Opflex, which can be in pads, pompoms and sausage-like boom. Overall, more than 11 million feet of boom was deployed in the spill.

**The best ideas**

Most often, the best new ideas identified by BP came from entrepreneurs like Smith — not conglomerates.

# Open-Cell Technology as Re-used / Recycled by BP



**Wringing as practiced by BP in the Gulf of Mexico.**

**Centrifuging as practiced by BP in the Gulf of Mexico.**

**Conventional white sorbents are not reusable, do not remove the oil from the water efficiently, and fill our landfills.**


***Open-Cell Technology has an additive that causes biodegradation in landfills.***

# BP endorses Open-Cell Technology for removing oil sheen and *passing US Coast Guard Stage 3 Inspections for Decontamination*

From: David Kinnaird <david.kinnaird@bp.com<mailto:david.kinnaird@bp.com>>
Date: Fri, 10 Dec 2010 07:16:38 -0600
To: Scott Smith <ssmith@cellecttechnologies.com<mailto:ssmith@cellecttechnologies.com>>
Subject: RE: question

Mr. Smith.
With respect to your question, I respond as follows:

We had light sheening in 4 port and stbd ballast tanks on the t/b Valiant. In lieu of cleaning the tanks, we placed Oplex snares and pom poms in the tank to absorb the oil therein. I am delighted to say that it workedextremely well. We cycled clean Oplex through the tanks twice and after thesecond application, no oil or sheening was observed. The tanks were sufficiently cleaned to pass a US Coast Guard Stage lll Inspection for Decon. I might add that the USCG is particularly sensitive to ballast tanks, for obvious reasons, so it is particularly significant that this worked so well because it alleviated the need to go in and clean by hand.
Sincerely,

Dave Kinnaird
BP Site Leader
Lake Charles, La.
TFN: + 1 337 480 6044
MOB: +1 281 224 6466

# Journal of Petroleum Technology - 2012

## TABLE 1—ALTERNATIVE RESPONSE TECHNOLOGY SUCCESSES
### Ideas recommended for use by responders

### OFFSHORE

- Controlled In-Situ Burning [Spilltec]: Extended, field-scale implementation of in-situ burning techniques previously planned and practiced only on a limited basis.
- Laser Fluorometer Submerged Oil Detection [EIC Laboratories with funding from the US Coast Guard]: Uses laser fluorescence polarization to detect nonfloating oil.
- Coda Octopus 3D Sonar [US Coast Guard R&D]: In conjunction with EIC's Laser Fluorometer, uses proprietary underwater sonar technology for detecting nonfloating oil.
- Side Scan Sonar [Fairweather Science]: Calibration and use of side scan sonar to detect nonfloating oil.
- Acoustic Doppler Current Profiler [T&T Marine]: Calibration and use of ADCP to detect nonfloating oil.
- Big Gulp Skimmer [LAD Services]: Barge equipped with wide weir skimmer and settling tanks for high-volume open water oil skimming.
- Wave Glider [Liquid Robotics]: Autonomous, self-propelled, remotely steered vehicle with capability to carry a wide range of monitoring instruments.

### NEAR SHORE

- Tar Ball Net [Tobu Services]: Modified shrimp net for capturing tar balls.
- V2 Vyper Platform [Vyper Adams]: Four-wheel drive vehicle with superior stability and light footprint, for use in sensitive beach and shallow water operations.
- Parachute Surf Skimmer [Holen Synergy Group]: Hand-deployed pond/pool skimmer adapted for use in recovering shallow water tar balls.
- Helicopter Boom Removal [Various sources]: Use of helicopter and grapple to vertically retrieve boom stranded in sensitive shoreline areas [e.g., marsh].
- Yates Boom Cleaner [Yates Construction]: Use of dishwasherlike assembly line transport and spray system to streamline used boom cleaning operations [improved cleaning rate].
- Boom Blaster [Gulf Coast Environmental Resources]: Use of car wash concept [cleaner, spray, brushes] to streamline used boom cleaning operations [improved cleaning rate and reduced manpower].
- Opflex Buoyant Open-Cell Foam [Cellect Plastics]: Bouyant polyolefin foam with high absorbency; reusable and available in multiple forms [pad, boom, pom pom, etc.].
- Low-Pressure Marsh Flusher [Core 4 – KEBAWK Group]: Barge equipped with low-pressure water wand for gently irrigating marsh areas to mobilize oil for recovery.
- Truxor Amphibious Tool Carrier [Megator]: Versatile, trailerable amphibious vehicle capable of tool transport, skimming operations, raking, pumping, and other uses.
- Water Curtain [D02E Wastewater Treatment]: Use of directed aeration pumps to create water positive flow barrier for protection of inland waterway from advancing floating oil without impeding vessel ingress/egress.
- Oil/Water Separation [Ocean Therapy Solutions]: High-volume centrifugal oil/water separator.
- "HOSS" Heavy Oil Skimming System [VOO Captain Gerry Matherne]: Custom-designed frame and netting device deployed from the vessel for highly efficient tar ball recovery.
- X-Tex Silt Barrier Fence [UltraTech] and Eco-Barrier Fence [Trinity Industrial Services]: Hydrophilic textile material installed as in-water "fences" to stop and divert oil approaching shorlines.

# List of Recommended Items (Successes)

- **Offshore**
  - Laser Fluorometer Submerged Oil Detection (Oscar)
  - Coda Octopus for Submerged Oil Detection
  - Big Gulp Skimmer
- **Near Shore**
  - Tarball Net and Test Net
  - V2 Vyper Platform for Marsh and Shallow Water Skimming
  - Parachute Surf Skimmer
  - Helicopter Boom Removal
  - Yates Boom Cleaner
  - Boom Blaster (Boom Cleaning Machine)
  - Opflex Buoyant Open-cell Foam
  - Low Pressure Marsh Flusher
  - Amphibious Tool Carrier (Truxor DM 5000)
  - Water Curtain (DO2E Wastewater Treatment)
  - Oil/Water Separation: Ocean Therapy Solutions
  - Bio Based Absorbent (Nature's Broom) – oil cleaning on beach/marshes
  - Bio Based Absorbent (Nature's Broom) – decon/cleaning procedures
  - Heavy Oil Skimming System (HOSS)
  - Silt Barrier Fence (X-Tex®)
  - Eco-Barrier Trinity Fence
  - RAT (Rapid Attack Tactic) for Skimming
- **Onshore**
  - Bio Energy Gasifier
  - Green Earth Sand Cleaner
  - Petromax Sand Wash
  - M-I SWACO Sand Cleaning
  - STS-101 Solids Washing
  - Eco-Oil Vortex (Beach Sand Washer)
  - Gravely Sand Cleaner
  - Ergonomic Beach Cleaning Tool (EZ-Zacks)
  - Sand Shark 3000 LeeBoy for Beach Cleaning
  - Ozzies OPP-200 for Beach Cleaning
  - Beach Tech 2000 & 3000 for Beach Cleaning
  - Cherrington 4600 & 5000 for Beach Cleaning
  - RECOVERIT from GOLF Energy Service
  - Clean Beach Technologies, Inc (Beach Restoration System™)
  - Chemstation Degreaser
  - Biomass Based Sorbent (Show Me Energy)
  - Field Analytical Methods (SiteLab Corporation)
  - REUSE recycling

# Captain Frank M. Paskewich USCG (Ret.) – Expert Report Sep 2014

## Alternative Response Technology Innovations

### Offshore

- Laser Fluorometer Submerged Oil Detection
- Coda Octopus 3D Sonar
- Side Scan Sonar
- Acoustic Doppler Current Profiler
- Big Gulp Skimmer
- Wave Glider


Coda and EIC Oscar


Big Gulp Skimmer

### Near Shore

- Tar Ball Net
- V2 Vyper Platform
- Parachute Surf Skimmer
- Helicopter Boom Removal
- Yates Boom Cleaner
- Boom Blaster
- Opflex Buoyant Open-Cell Foam
- Water Curtain
- Low-Pressure Marsh Flusher
- Truxor Amphibious Tool Carrier
- Oil/Water Separation
- "HOSS" Heavy Oil Skimming System
- X-Tex Silt Barrier Fence and Eco-Barrier Fence


Boom Blaster


Water Curtain


X-Tex Silt Barrier


HOSS

### Onshore

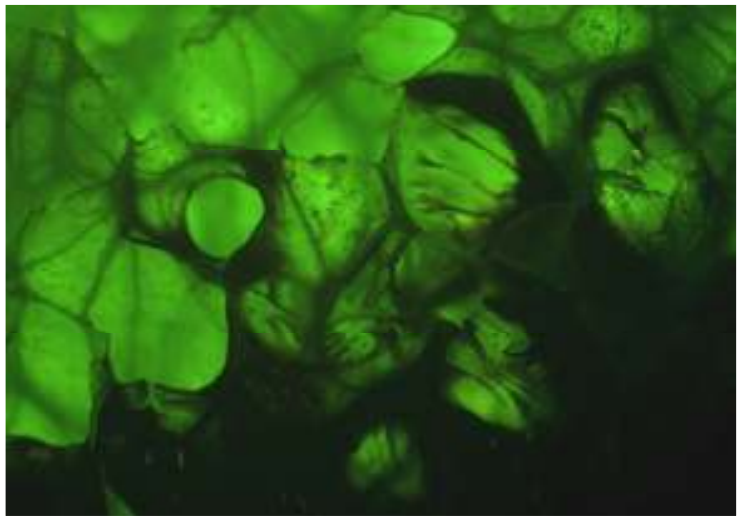
- Reflectance Spectrometer
- Bio Energy Gasifier
- Booms to Bumpers
- Soft Boom Recycling
- Tar Balls to Asphalt
- Green Earth Sand Cleaner
- Petromax Sand Wash
- M-I SWACO Sand Cleaning
- STS-101 Solids Washing
- Vortex Beach Sand Washer
- Big Green Sand Machine
- Gravely Sand Cleaner and Barber Sand Man
- EZ-Zacks Ergonomic Beach Cleaning Tool
- Sand Shark
- Ozzies OPP-200
- Beach Tech 2000, 2800 & 3000 for Beach Cleaning
- Cherrington 4600 & 5000 for Beach Cleaning
- RECOVERIT
- Beach Restoration System
- ChemStation "7248" Degreaser


Sand Shark


Contaminated Beach


Sand Shark Cleaned Beach

# Open-Cell Technology
# Based on Biomimicry of the Human Lungs & Natural Eelgrass
# The Insanely Simple & Proven Solution



# Open-Cell Technology is Simple to Implement

## Just Put the Open-Cell Filter Bag in Front of the Drain

## Oil and Grease (PPM) Testing EPA-1664

**(Everything Above Arrow: 100 PPM Results in Fines from the EPA)**

Pictures on Right Open-Cell Tech Before and After Removing Oil and Grease from Wastewater Drain

# Lessons Learned – Flint Michigan

- **This is 2017 not 1950…**
  - The 1950's public relations playbook no longer works with an informed community with access to information and ability to verify facts.
  - Politics can not drive the messaging.
  - Hiring public relations firms to spin false narratives severely impairs credibility within a community.
- NGO's (Water Defense) working directly with Federal (EPA) and State Agencies in a respectful, professional, and collaborative way is essential in building trust within a community and bringing people together to solve the crisis.

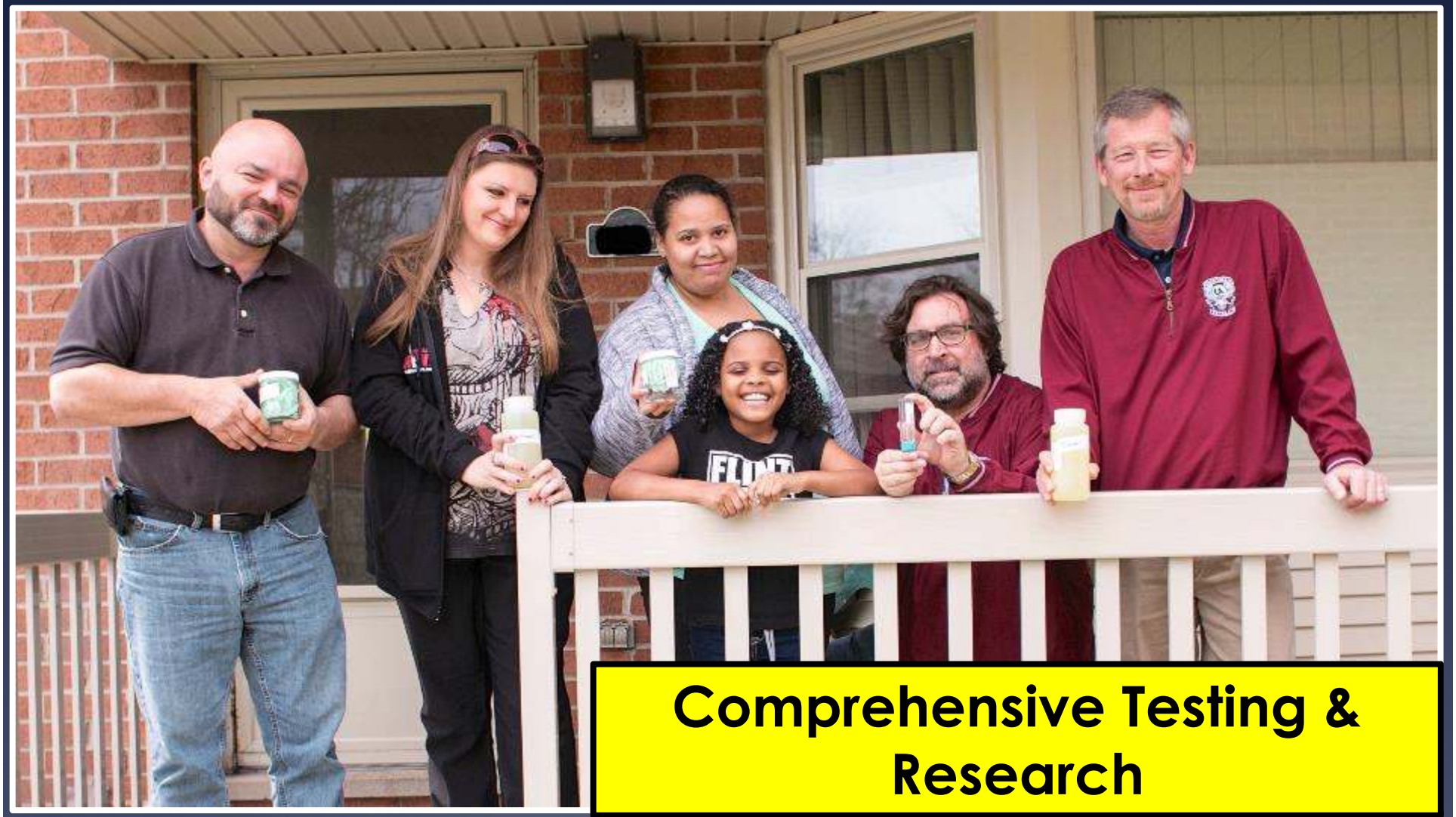
# Problems in Flint – Future Solutions

- Problems/Missteps
  - **Unidirectional communications and contrived statements/messages with audiences.**
  - Absence of trusted independent experts with full transparency.
  - **Arrogance and condescending statements to affected residents in the community.**
  - **False comparisons that lose credibility with the community (i.e. Flint is just like any other city)**
- Solutions
  - **Do not be afraid to say, I don't know!**
  - Have open town hall meetings where there are equal and open communications with affected residents.
  - **EPA/Water Defense work together in communicating detailed information to affected residents in small groups and/or on an individual basis when warranted.**
  - Social media engagement, providing timely information and updates to the community – without PR people.

# Effective Town Halls / Group Meetings

- **Manage conflict upfront.**
- Large group methods:
  - Educate on issues of concern.
  - Address questions and listen.
  - Learn from stakeholder perceptions and information.
  - Encourage 2-way conversations that are not contrived.
  - Increase participant knowledge and understanding.
- **Focus on common ground versus differences**.

# A Collaborative and Team Approach in Flint



# Water Testing Plan

## Site Plan Development

- Situation Statement
  - Specific Concerns (water color, reported illnesses,)
  - Scope of Investigation
- Site Overview: Identify Pipes, Meter(s), Water Heater(s), Sinks and Showers/Tubes, Cooling Towers
- Preliminary Test Plan: Locations of Samples

## Test Program Execution

- Secure Customer Approval
  - Present Plan
- Deploy UA plumber or pipefitter and Scott Smith to Premise to Collect Samples
- Follow Chain of Custody Protocol and Package/Ship Samples to Laboratory
- Enter Project Information in System for Tracking

Recent Studies in Released in 2017 have Confirmed Concerns about Galvanized Pipes Raised by Harold Harrington/Ben Ranger/Scott Smith in January-March of 2016 – Why is this Important?

# Citizen Science, Union Plumbers, & Water Defense
# Flint 2016

# LuLu Brezzell

You're friends on Facebook

Lives in Grand Blanc, Michigan

Studied at University of Michigan–Flint

APR 12, 9:12 AM

I see your the water guy. have you guys found out whats in the water causing the rashes. The EPA and CDC have been less then helpful.


INT
ES
ER


/OC


Metals


DC

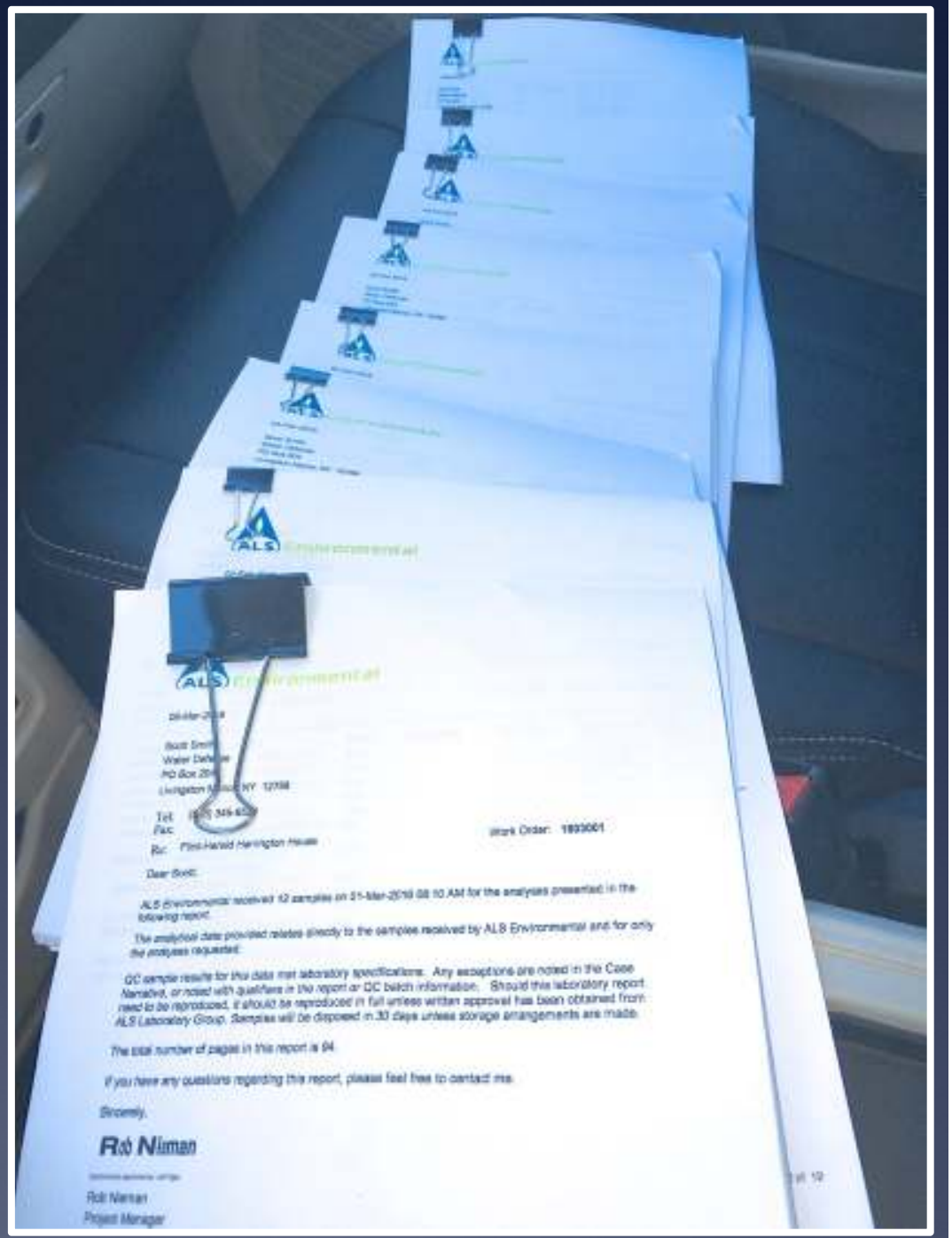
Westside Diner

Luigi's Pizza

White Horse Tavern


Water bath
Garlic 4/23/16

# Independent Detailed Lab Reports to the Citizens & Residents of Flint



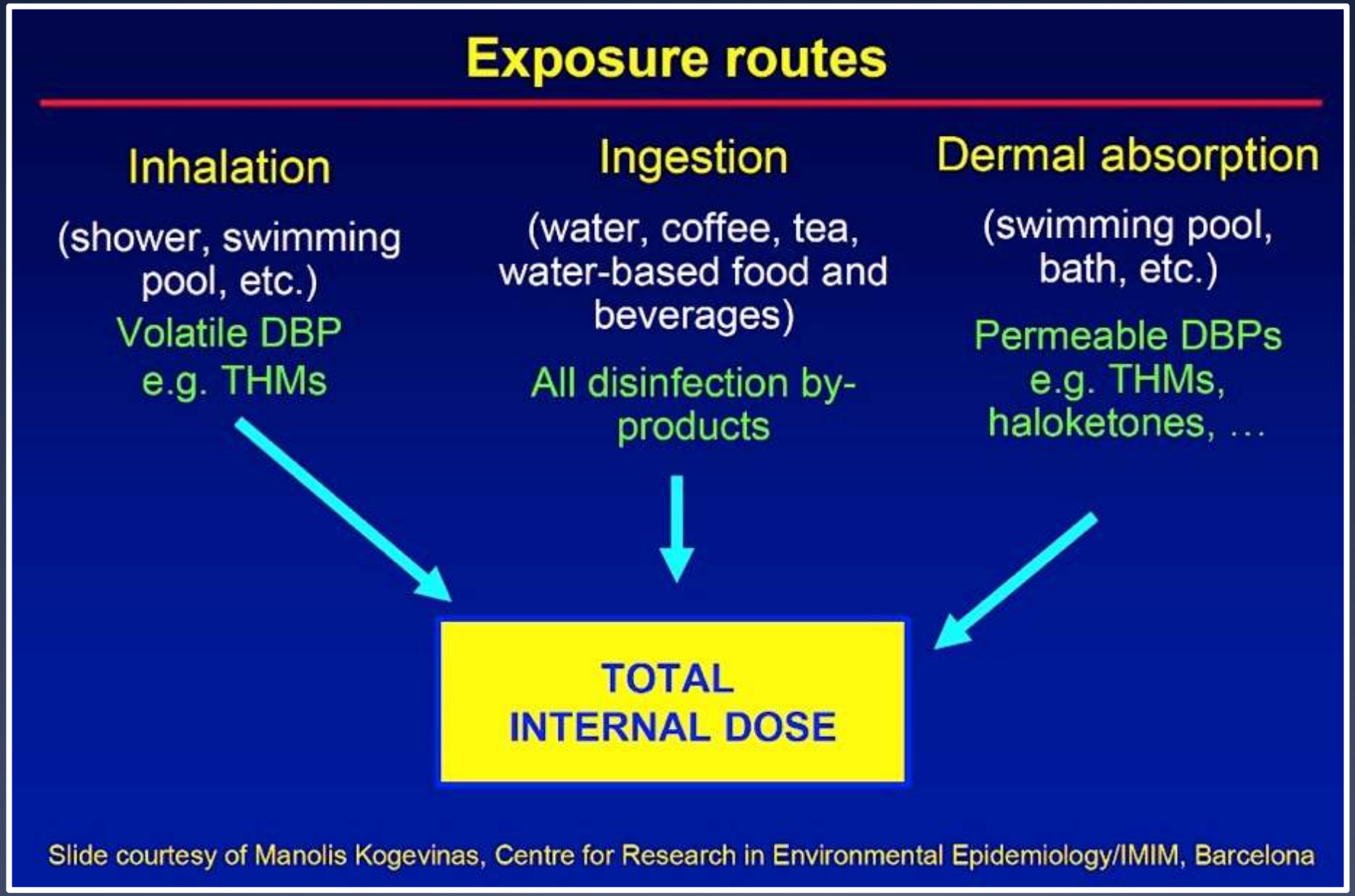
# ALS Environmental – Independent Lab

- As one of the largest environmental laboratory networks in the world, ALS has the resources and expertise to meet the analytical needs of all your projects. ALS provides a full range of environmental testing services, specializing in the analysis of air, soil, sediment, water, and much more. Experienced experts at ALS are ready to provide the reliable data that helps clients make informed decisions about projects.

- **The ALS laboratory in Cincinnati is a full-service environmental, air, and industrial hygiene laboratory. This facility is an Ohio EPA Voluntary Action Program (VAP) and American Association for Laboratory Accreditation (A2LA) accredited laboratory providing environmental analytical services to government and private clientele such as the EPA, Departments of Defense and Energy, and numerous environmental engineering firms. In supporting environmental investigation and monitoring programs, ALS performs a full range of organic and inorganic analyses using SW-846 and EPA methodologies on a wide range of sample matrices including groundwater, surface water, wastewater, soil, sludge, and hazardous waste.**

- The ALS facility in Cincinnati is accredited by the AIHA-LAP (100921), LLC, and offers a comprehensive array of both NIOSH and OSHA analytical methods. The Cincinnati laboratory also performs EPA, ASTM, AOAC, and other innovative methods developed by our own staff. These methods may be adapted to situation-specific requirements in support of industrial hygiene programs, indoor air quality assessment, odor detection, and other types of air testing.

# EPA – Research "DBP's" – Susan Richardson -2009



# EPA – Research "DBP's" – Susan Richardson -2009 Cont.

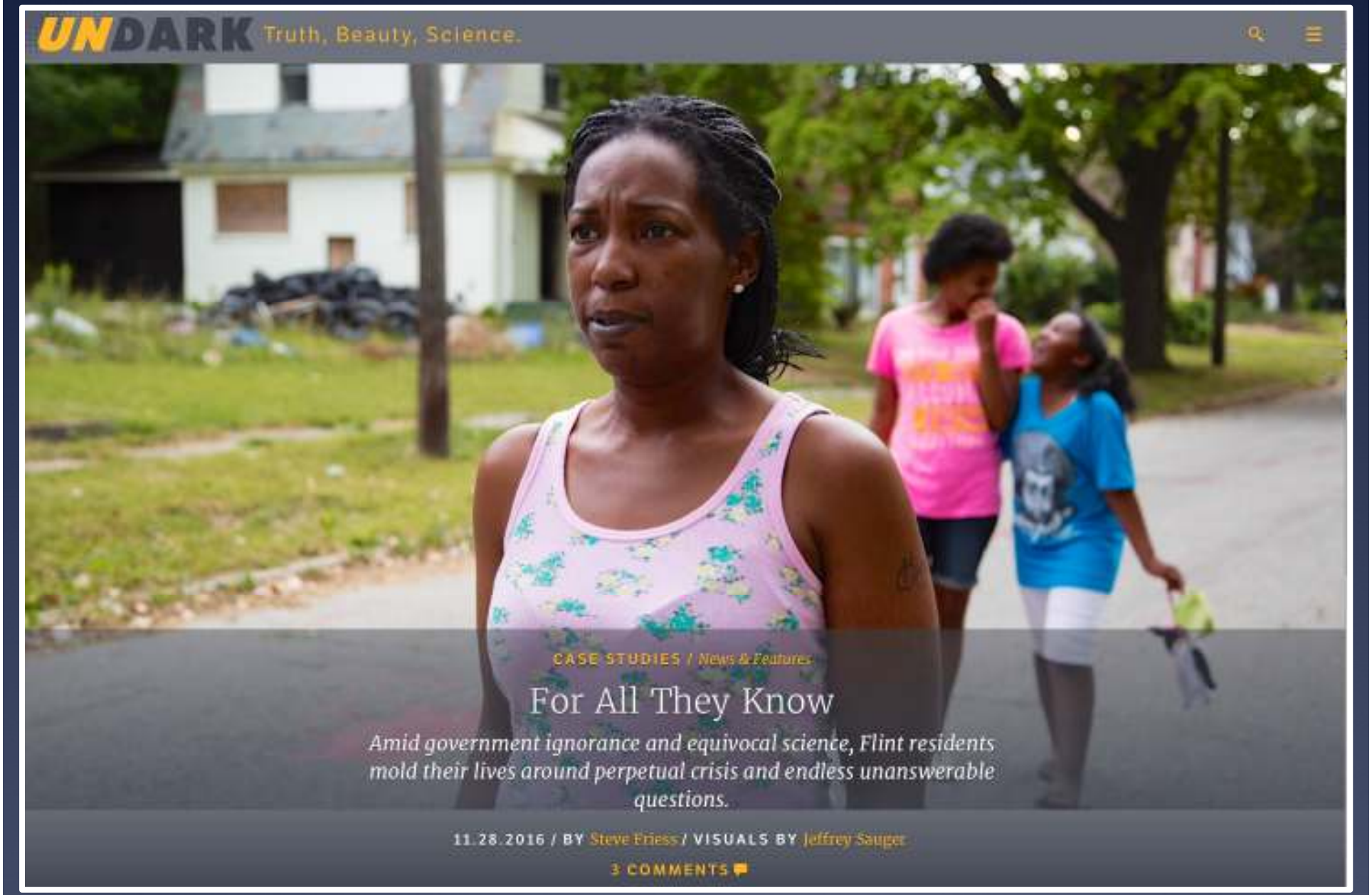
## Route of exposure is important….

- Can get 2X exposure from 10 min shower compared to drinking 2L of tap water (inhalation)
- Some DBPs dermally absorbed
- Evidence of increased bladder cancer with swimming in indoor pools (inhalation, dermal): Villanueva et al., *Am. J. Epidemiol*. 2007, *165*, 148-156.

# Conclusions as of 5/26/16 – Still Apply in April 2017

- **We need much more testing data along with sound science & toxicology studies to reach accurate conclusions.**
- We must continue to provide the Community with as much information as possible and continue (to the best of our ability) complete and thorough testing of water and air in homes.
- We must understand that without proper toxicological studies that we cannot draw any Cause & Effect relationships between chemicals detected and reported health effects. Epidemiological studies are also critical to better understand the affected Flint residents and the serious gaps that currently exist (e.g., no showering / bathing standards)
  - **Without standards and cause and effect relationships, it is difficult to draw definitive conclusions that it is either safe or not safe to bathe or shower in Flint water.**
- We are committed to doing the research and gathering the data to get the answers for the Flint residents that they deserve.
- **Given what we know and what we don't know, there is no way that the concerns and questions of the Flint residents should not be clearly and precisely addressed**!

# Undark Margazine – Article – November 2016

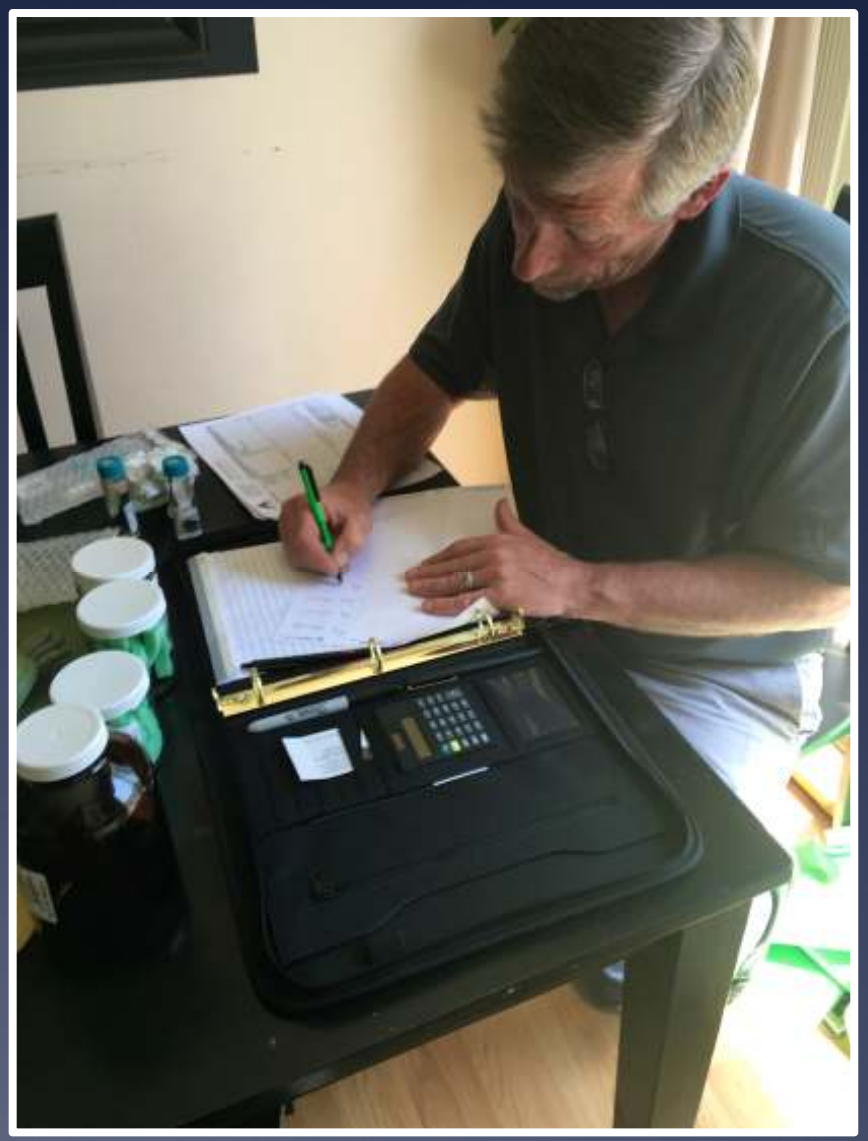


# Undark Margazine – Article – November 2016

* **"We know very little about the microbial water quality in pipes and distribution systems and household plumbing,"** said Joan Rose, a microbiologist at Michigan State University who has been actively researching the emerging Flint crisis since 2014. In March, Rose was awarded the prestigious Stockholm Water Prize for her research into water quality, microbiology, and public health.
* "You mean we know very little about that in Flint?" I asked.
* **"No, I mean we don't know that much about it at all, anywhere."**
* "Well," I replied, "that's kind of terrifying."
* "It should be," she said.

# Bacteria Testing in Flint began in May 2016


# Harold Harrington of UA370 – Testing/Chain of Custody



# Q Laboratories, Inc. Background

* Q Laboratories, Inc. has provided analytical chemistry and microbiology laboratory services to companies around the world since 1966. **Registered with the FDA for pharmaceutical testing (Reg.# 1527260), ISO/IEC 17025 Accredited, OEPA Certified for Microbiological Analysis of Drinking Water and a CDC ELITE certified laboratory for Legionella Analysis in water samples, Q Laboratories, Inc. is experienced in analyzing foods, beverages, pharmaceuticals, OTCs, cosmetics, health and beauty products and water.**

* Microbiology capabilities include: Pathogen Detection (including E. coli and Legionella), Indicator Organism Enumeration (Plate Count and Coliform), Microbial Identification (MALDI-TOF). Analytical chemistry services include: Total Organic Carbon and Conductivity analysis.

* An independent laboratory, combining state-of-the-art technology with personal service and attention, Q Laboratories, Inc. can provide customized services to meet a wide variety of testing and quality control needs.

# Innovative Technology / Testing with Plumbers

**Test kit shown to the left, includes Grab Sample Vials for VOC's, Metals, SVOV's, and Water-Bug (including bacteria)**

# Flint, Michigan: New Process Deployed with UA370

**Key Point: Test at the Water Meter…is water from distribution system the problem?**

**Key Point: Test hot water in the shower and bath tub**

# Pilot Testing with UA Plumbers & Pipefitters

**As part of Pilot Program, Water-Bugs deployed at Cooling Towers**

**Safety and Personal Protection Required**

# Pilot Testing with UA Plumbers & Pipefitters

**Also, Water-Bug deployed by UA Contractor**


**Scott C. Smith**
@WaterWarriorOne

Declan Mik Murphy Feb-2017:Born Lead Poisoned #FlintWaterCrisis Met Him at 6 Wks Old Color Was Blue: Changed My Life Forever: Fight 4 #Flint


2320
GRANDSON
PLAYED
NATIONALS

**Scott C. Smith**
@WaterWarriorOne

Thx 2 Mothers & Plumbers 4 Inspiration & Uniting to Fight 4 Clean H2O: w/ Bob Bowcock & @ErinBrockovich & Filmed Today w/ @TheYoungTurks

Thx @ErinBrockovich 4 inspiration, moral support, & welcoming me to the club after defamation #FlintWaterCrisis. We will Kick Ass Together!