Overview of Stormwater Testing and Evaluation for Products and Practices (STEPP)

ACWA Stormwater Roundtable Meeting
San Antonio, TX | February 4, 2020

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Water Environment Federation
Stormwater Institute

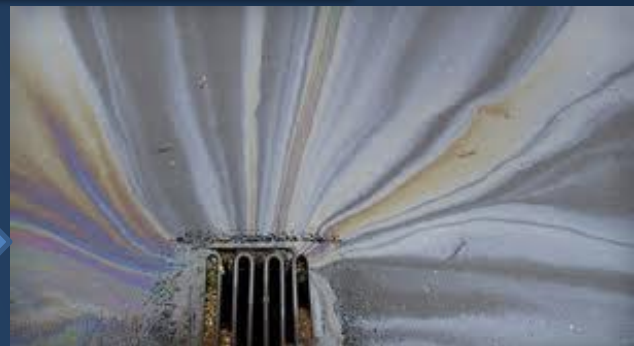
How well do stormwater control measures perform?

Nature of the Problem

Depends upon point of view…

- **Manufacturer:** Product/practice approval process is a barrier
  - Can be challenging and a barrier to innovation and competition
- **Consumer:** Lack of independent testing
  - Reduces confidence in product/practice performance/efficacy
- **Regulator:** Uninformed product/practice consumers
  - May lead to under-performing stormwater programs

Ultimately impacts water quality…..



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Goal of STEPP

Develop a national testing/evaluation and verification program for stormwater products and practices

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Goal of STEPP

Verification

Test performance of products/practices in a standard way

Certification

Performance of verified products/practices meets regulatory performance standards

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Goal of STEPP

- Increase overall performance
- Create level/higher playing field
- Provide greater confidence in performance of stormwater systems
- Improve water quality

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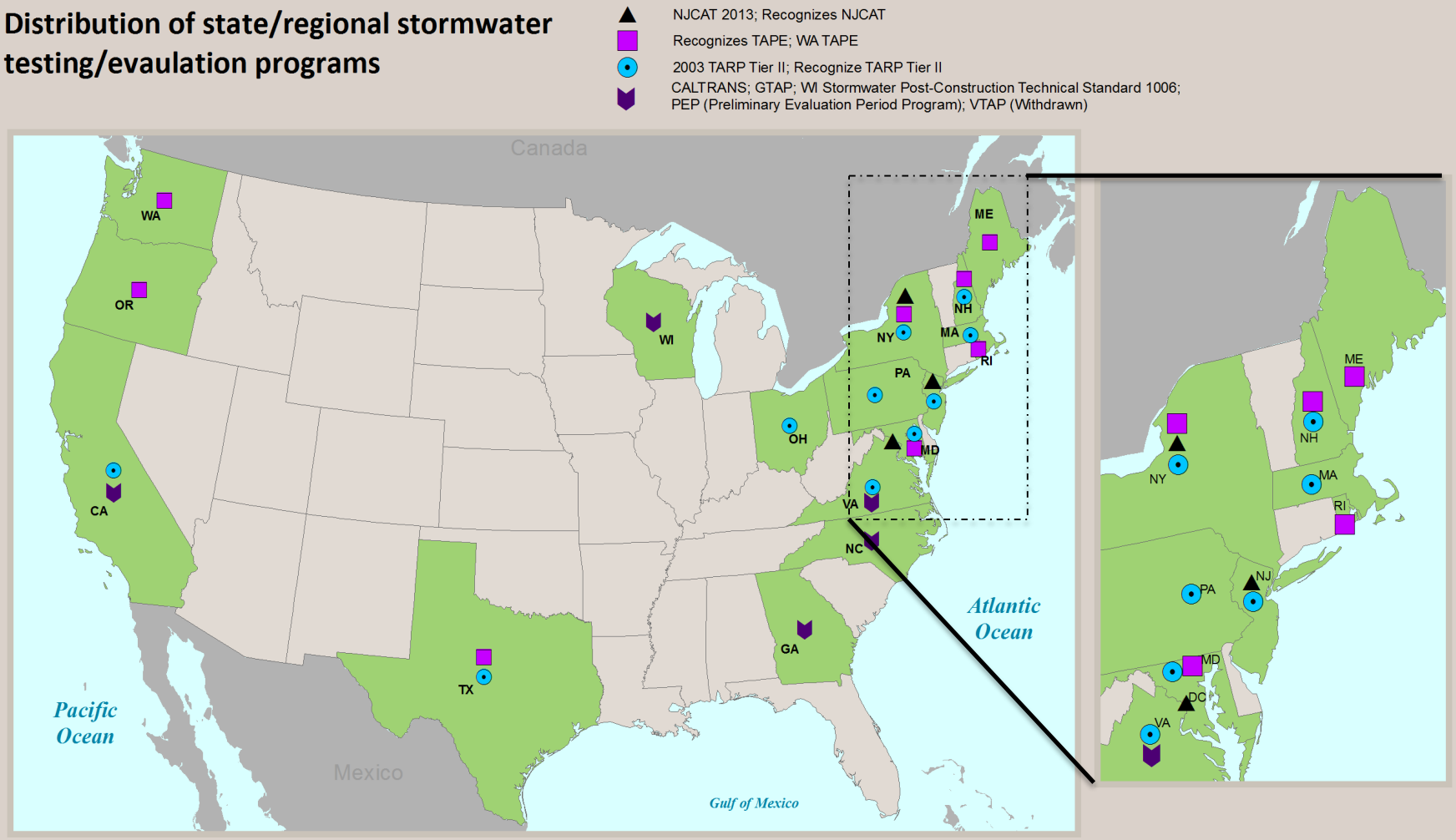
Past/Existing Programs

Distribution of state/regional stormwater testing/evaulation programs



STEPP Program Consortium Partners

WEF	WRF	ASTM	ITRC	WA-TAPE	NJ-CAT/DEP
• Governance • Administrative Support • Leadership • Regulatory and Sector Engagement • Promotional Support	• Database Support / Management • Innovation Support • Project Management	• Preliminary and Ongoing Technical Standards Development	• Guidance Development • Training Support • State Regulatory Outreach and Engagement	• Provides Basis for Field Testing Protocol • Technical Assistance • Country-wide Recognition and Acceptance	• Provides Basis for Lab Testing Protocol • Technical Assistance • Country-wide Recognition and Acceptance

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Summary of STEPP

- 2012 – Initial investigation
- 2013 – Effort to develop Feasibility White Paper
- 2014 – Feasibility White Paper and webcast
- 2015 – EPA support to develop a framework report
- 2016 – WERF STEPP framework report published
- 2017 – Meeting held at WEF; initial consortium formed
- 2018 – Follow up meeting held at WEF; consortium group refined and expanded
- 2019 – Development of subgroups; potential seed funding identified; ASTM initiating standardization of NJCAT/TAPE protocols

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Manufactured Treatment Device (MTD) Provider Perspective

Vaikko Allen
Director – Stormwater Regulatory Management
Contech Engineered Solutions, LLC
vallen@conteches.com
310-850-1736

CONTECH ENGINEERED SOLUTIONS

www.conteches.com

Manufactured Treatment Device (MTD) Performance Verification

- > 50 MTDs currently marketed in the US
  - Biotreatment, Media Filters, Hydrodynamic Separators
- > 25 distinct state or regional MTD approval programs
  - Patchwork of performance targets and verification standards
  - TAPE field monitoring
    - $250k to $400k, 2-4 years
  - NJ DEP Lab testing
    - $50k -$100k, 1 year

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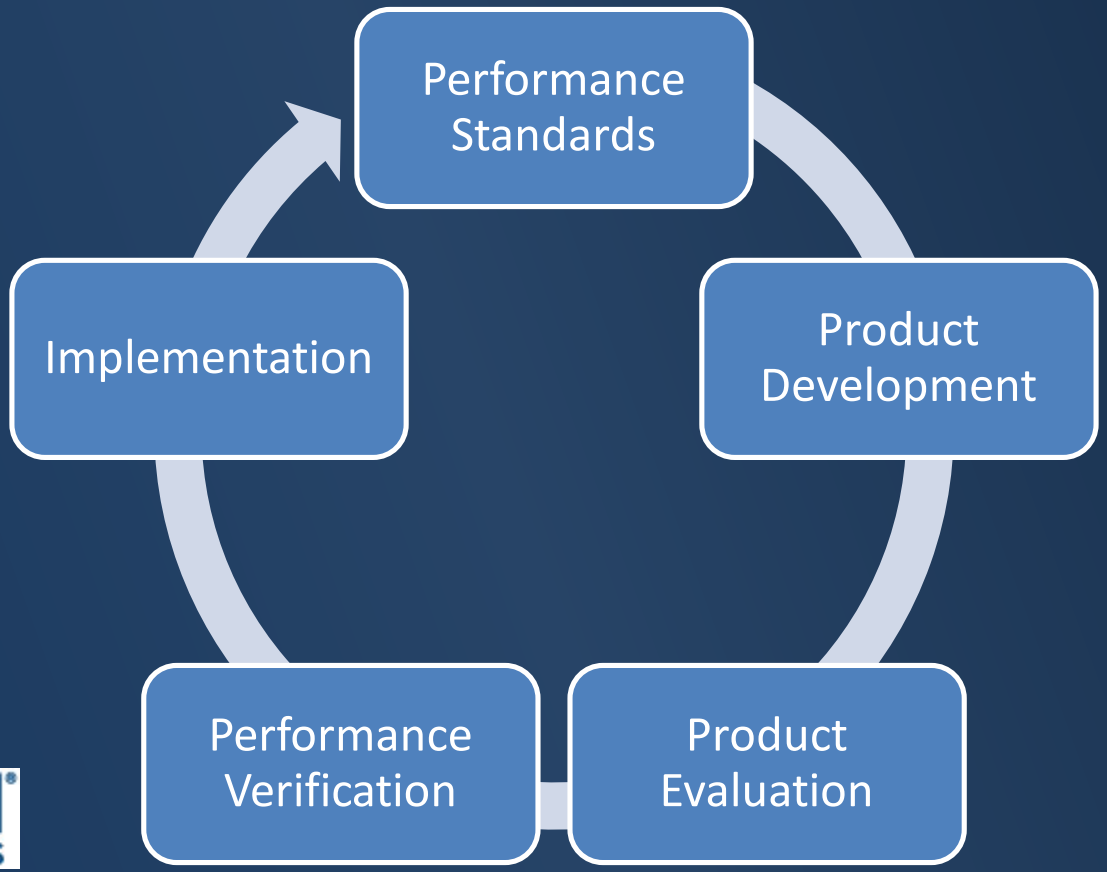
I ♥ Performance Standards

Clear, quantitative performance standards and robust peer review drive innovation



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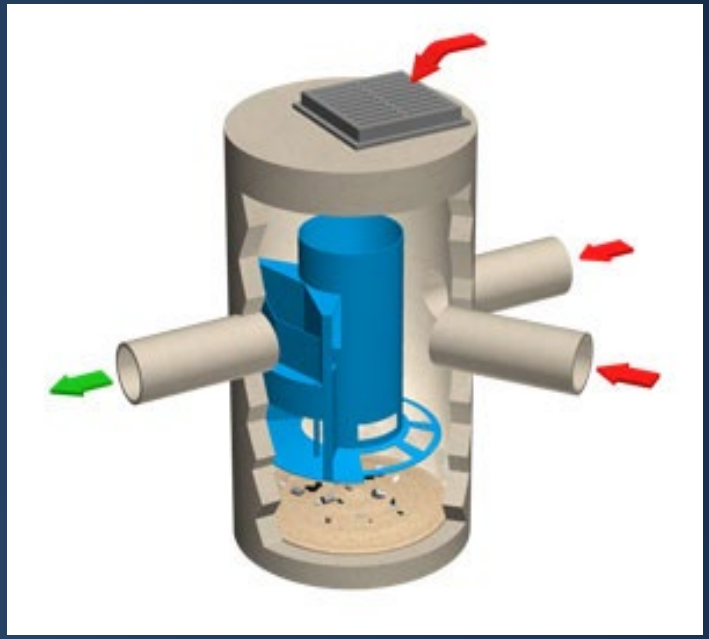
Cascade Separator Development Process

- Project justified by NJ HDS market and others recognizing NJDEP certification
- Designed around the NJDEP HDS protocol

  Required:
  - 10,000 hrs CFD modeling
  - 20 product iterations
  - 150 performance tests
  - 6,000 lbs of sediment
  - Significant lab upgrades



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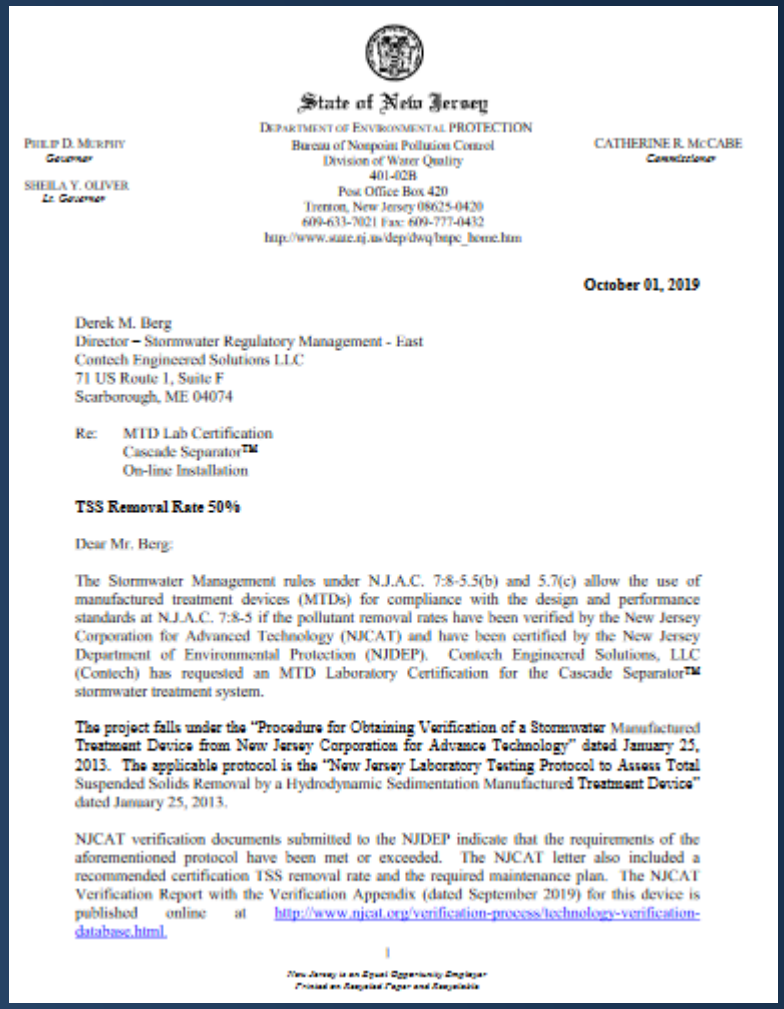
Cascade Separator Project Result

- Verification report issued by NJCAT
- Certification report issued by NJDEP
- Reciprocal approval in select markets outside of NJ



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Nonpoint Pollution Control
Division of Water Quality
401-02B
Post Office Box 420
Trenton, New Jersey 08625-0420
609-633-7021 Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Commissioner

October 01, 2019

Derek M. Berg
Director – Stormwater Regulatory Management - East
Contech Engineered Solutions LLC
71 US Route 1, Suite F
Scarborough, ME 04074

Re: MTD Lab Certification
Cascade Separator™
On-line Installation

TSS Removal Rate 50%

Dear Mr. Berg:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Contech Engineered Solutions, LLC (Contech) has requested an MTD Laboratory Certification for the Cascade Separator™ stormwater treatment system.

The project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated September 2019) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

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Pooled Demand is Powerful!

- Majority of private sector R&D is driven by NJ and TAPE standards
  - Sediment (TSS)
  - Total Phosphorus
  - Dissolved Cu, Zn
- CA Trash Amendments also driving innovation

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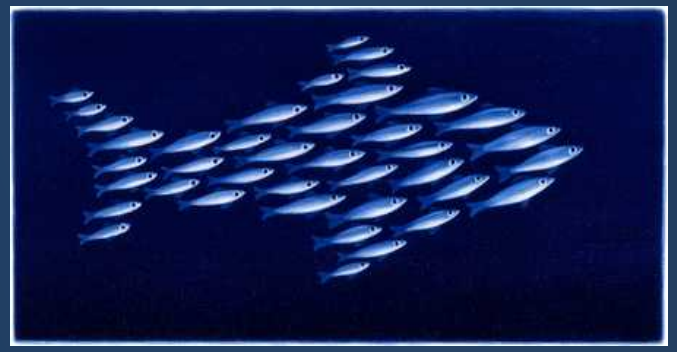
An Aspirational Vision

- Municipal NPDES permittees share common performance standards and verification programs
  - Lack of Funding, Expertise and/or Willingness to develop unique programs no longer a barrier
- Private sector innovation engines unleashed
- Greater certainty in modeling and planning to meet water quality standards
- Equity between MTDs and conventional BMPs



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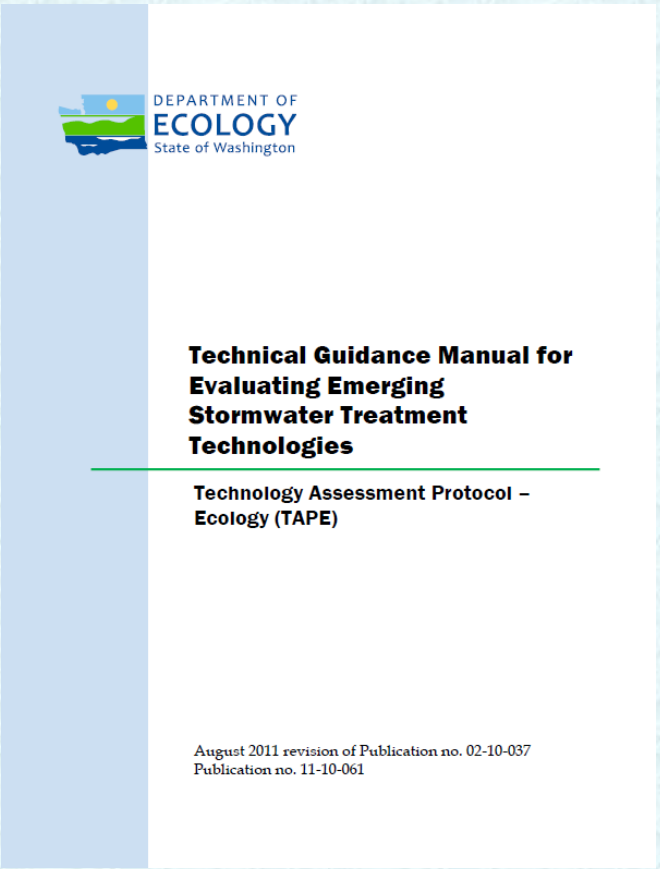
DEPARTMENT OF ECOLOGY
State of Washington

Technology Assessment Protocol – Ecology (TAPE)



WELCOME

ACWA Stormwater Roundtable
February 4, 2020

Brief History of TAPE

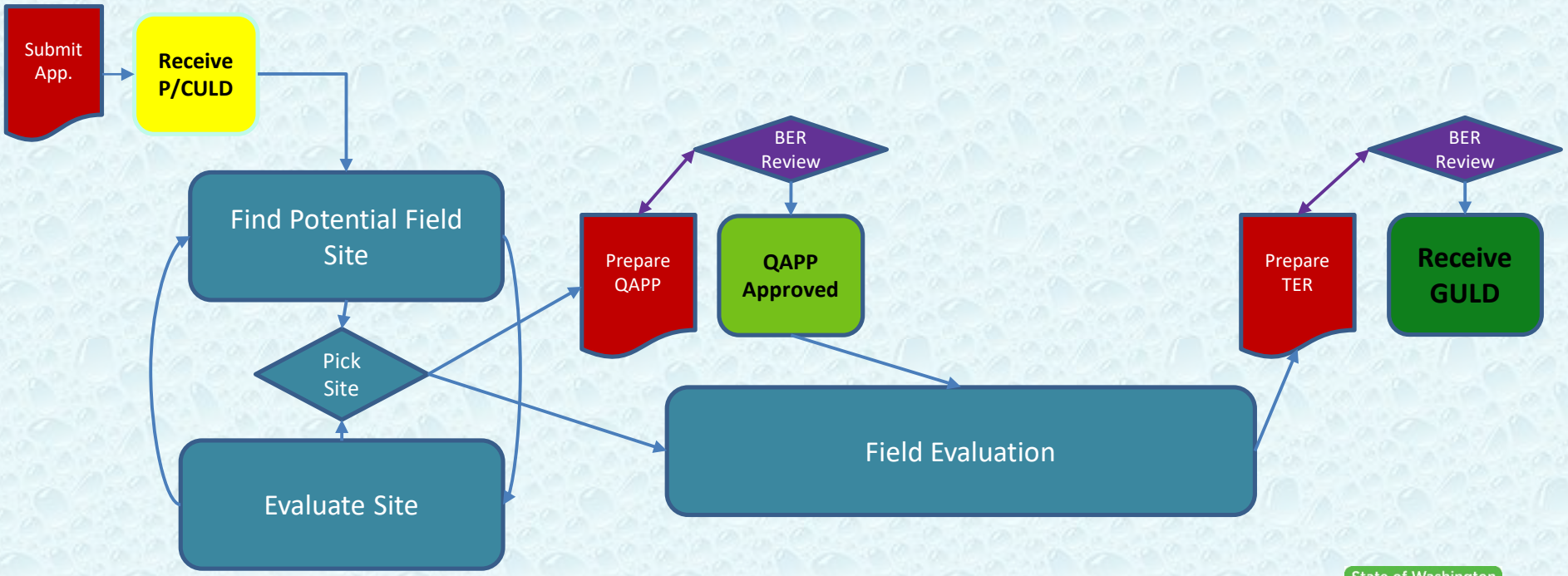
- 1999 APWA Protocol
- October 2002 – TAPE 1.1
- June 2004 – TAPE 1.2
- February 2006 – TAPE 1.3
- January 2008 – TAPE 2.0
  - Definition of TSS changed
  - 1 instead of 2 sites to monitor
  - Particle Size Distribution
- January 2011 – TAPE 3.0
  - Continuous flow and bypass monitoring required
  - Enhanced Treatment Performance Goal Defined
  - Particle Size Distribution Analysis Required
  - Specific Statistical method developed (Bootstrap)
  - Review Process Formalized

TAPE closed to new applications from May 2008 to March 2011

Board of External Reviewers

- Seth Brown, PE, Ph.D., Storm and Stream Solutions, LLC
- G. Allen Burton, Ph.D., University of Michigan
- Allen P. Davis, PE, Ph.D., University of Maryland
- Donald Carpenter, Ph.D., P.E./LEED AP
- James Houle, MA, CPSWQ, Univ. New Hampshire Stormwater Ctr.
- Dick Magee, PE, Sc.D., New Jersey Corporation for Advanced Technology
- Kurt Marx, PE Marx Environmental Solutions
- Dipen Patel, Ph.D, California State University, Sacramento
- Larry Roesner, PE, Ph.D, Colorado State University
- David Sample, PE, Ph.D. Virginia Tech
- Michelle Virts, P.E. LEED AP
- Eric Strecker, PE, Geosyntec Consultants

Current TAPE Program
~ 3 years



State of Washington TAPE GULD

Use Level Designation	Minimum Data Required	Time Limit (months)	Maximum No. Installations	Field Testing Required
Pilot (PULD)	Laboratory	30	5	Minimum of one site indicative of or located in PNW, all sites monitored
Conditional (CULD)	Field data required (outside PNW adequate)	30	10	Minimum of one site indicative of or located in PNW
General (GULD)	PNW Field data	Unlimited	Unlimited	Monitoring for maintenance during first year of use

State of Washington TAPE GULD

DEPARTMENT OF ECOLOGY
State of Washington

TAPE Fee Structure

Fee Category	Amount	Due
Initial Application	$5,000	Upon submittal of *Initial Application*
Quality Assurance Project Plan (QAPP) Review	$10,000	Upon submittal of final QAPP
Technical Evaluation Report (TER) Review	$15,000	Upon submittal of final TER

1. Fees must be paid before Ecology begins review of any submittal and/or updates the TAPE website to reflect the technology's status. Collection of fee does not guarantee approval of QAPP or TER.
2. Applicant is responsible for all costs of monitoring including site selection, device installation, sample collection and analysis, safety, and QAPP and TER development.

Ecology Treatment Goals

Basic Treatment

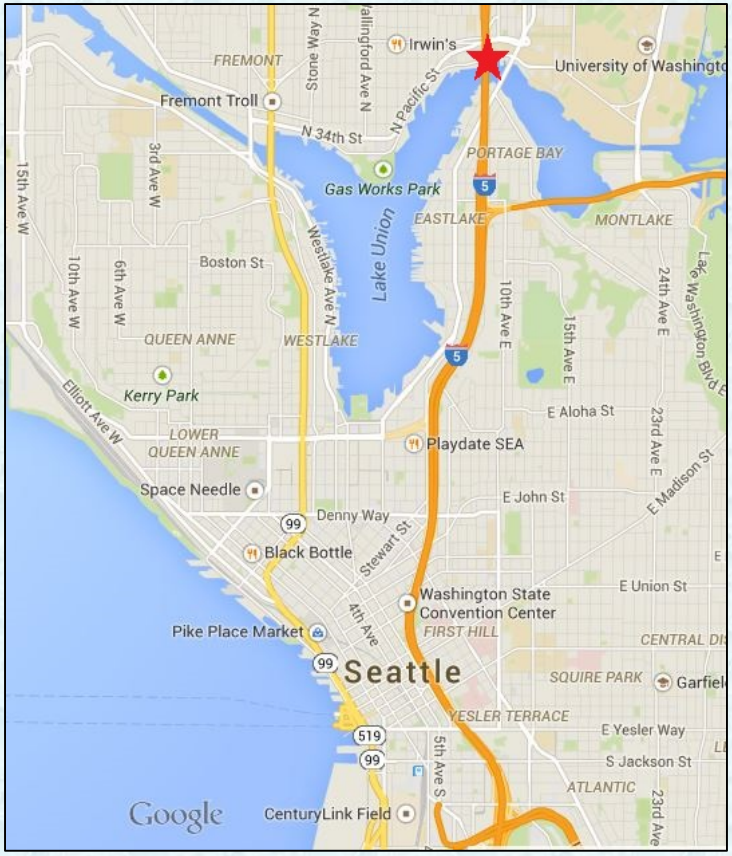
- TSS Influent
  < 100 mg/L
  20 mg/L effluent
- TSS Influent
  100 to 200 mg/l
  80% removal

Phosphorus Treatment

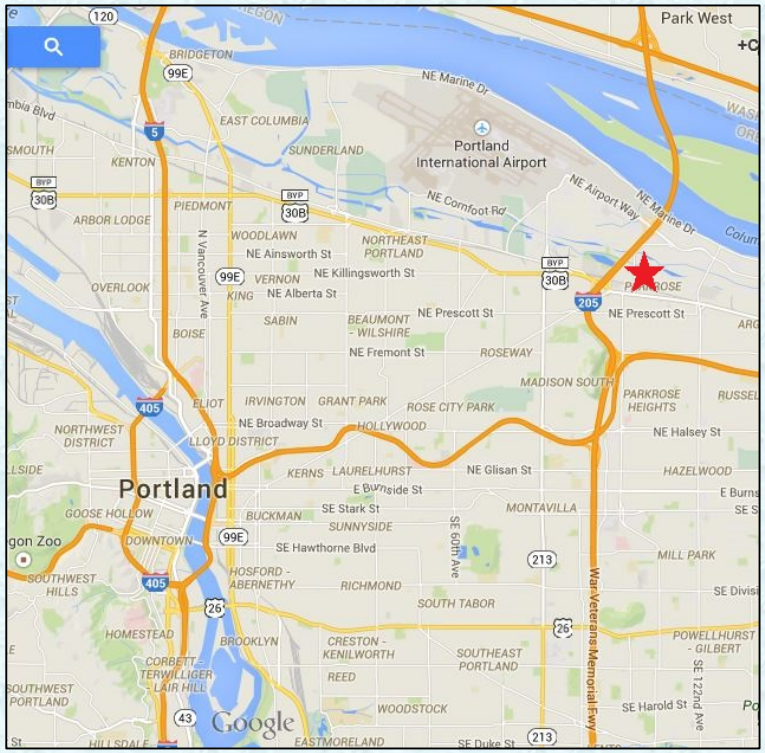
- TP Influent
  0.1 to 0.5 mg/L
  50% Removal
- No Orthophosphate removal requirement

Enhanced/Dissolved Metals Treatment

- Dissolved Zinc
  - Influent 20 to 300 ug/L
  - 60% removal
- Dissolved Copper
  - Influent 5 to 20 ug/L
  - 30% removal



Lake Union Ship Canal Research Facility



Oregon Stormwater Technology Testing Center (STTC)

University of New Hampshire Stormwater Center

Oregon State University Green Stormwater Infrastructure Research Facility

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seth.brown@stormandstream.com

YOUR QUESTIONS?

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OUR QUESTIONS

1. WOULD CERTIFICATION OCCUR FOR YOU AT THE STATE OR THE LOCAL LEVEL?
2. IF AT THE STATE LEVEL, WHAT TYPE OF INFORMATION WOULD YOU NEED?
3. HOW WOULD STEPP FIT INTO YOUR REGULATORY LANDSCAPE?
4. WHAT ARE YOUR NEEDS IN THE FUTURE?

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