Washington Public Ports Association Marine Terminal
AKART “Experience”
Our Agenda

- Defining AKART (All Known And Reasonable Methods of Prevention Control and Treatment)
- Seek NGO and Ecology’s timely approval
- Provide our customers with more certainty!
Industrial Stormwater General Permit (ISGP) Background

- ISGP covers 1220+ industrial facilities in WA
- Requires SWPPP, operational & structural source control & treatment BMPs
- Inspections
- Pollutant monitoring and comparison to state benchmarks
- Corrective actions if above benchmarks
  - Time consuming
  - Expensive
    - End of pipe treatment
Industrial Permittees

Permittees are presumed to be in compliance IF:

- Must Implement AKART (although not defined)
  - Use Adaptive Management
  - Fully meet the permit requirements
- Discharge must not cause or contribute to Water Quality Violation
Strategic Plan initiative:

- Goal 5: Advance Environmental Stewardship
  - Strategy: Partner and find innovative solutions to our customers' environmental challenges
  - Objective: Identify and develop maritime industrial stormwater best management practices
    - Task: WPPA/DOE/Ports AKART study to support POT and tenant marine cargo facilities ISGP
Port of Tacoma and Tenant Permits

983 Acres

Stormwater Permits
- Port Permits
- Tenant Permits
Industry-wide Challenges

Port/Terminal operator challenges:

- Limited real estate
- Cost effective solutions
- Lack of certainty
  - *When are we done?*
- Location in the watershed
- Operational constraints
- Not the only source
  - Ambient Deposition
The Team

Steering Committee
- Port of Port Angeles
- Port of Grays Harbor
- Port of Everett
- Port of Bellingham
- Port of Olympia
- Port of Tacoma
- Port of Seattle
- Pacific Merchant Shipping Association
- Marine Terminal Operators

Consultant Team
- Kennedy/Jenks Consultants
  - Herrera Environmental Consultants
  - KPFF Consulting Engineers
  - Ann Farr Environmental Management Consulting Services

Stakeholder Contributors
- Puget Soundkeeper Alliance
- Citizens for a Healthy Bay
- Washington Environmental Council
- WA State Department of Ecology
Expected Outcomes

Develop a “Playbook” that will:

• Define AKART for Marine Cargo Terminals
  • Strive for certainty and consistency
  • Outline the process
  • Provide an evaluation and selection matrix for BMPs for port operations and tenants
• Provide clear ISGP compliance pathways for WA Marine Terminals (also appropriate for others)
• Define “Reasonable” treatment approaches meeting State AKART standards
• Achieve water quality goals while reducing permit compliance uncertainties
• Obtain Washington State Department of Ecology Support
• Secure support of Puget Sound NGO’s
• Influence next permit cycle (2015)
The Approach

• Leverage opportunities of the existing permit
  ➢ Did not want to change the existing permit
• Define the operational & structural source control BMPs for Marine Terminals
  ➢ ID what technology works best
• Set clear expectation for all parties
  ➢ Lets not litigate this
• Define “Reasonable” treatment
  ➢ This was undefined, with no financial or practicable limits
• Engage stakeholders in the develop of the process
  ➢ Everyone had “skin in the game”
A Pathway Forward

1. **START**
   - Apply Mandatory Operational & Structural Source Control BMPs from ISGP & SWMM, or Equivalent

2. Meeting ISGP Benchmarks?
   - Yes
     - Select L3 Treatment BMPs Based on Concentration
     - \( C_{\text{high}} = T_1, T_2, T_3 \)
     - \( C_{\text{medium}} = T_1, T_2, T_3 \)
     - \( C_{\text{low}} = T_1, T_2, T_3 \)
   - No
     - Trigger L3

3. **Trigger L1, L2**
   - Apply Additional Operational & Structural Source Control BMPs

4. Meeting ISGP Benchmarks?
   - Yes
     - No Further Treatment Required
   - No
     - No

5. **Trigger L3**
   - Concentration Based Treatment Reasonable for Facility?
     - Yes
       - Engineering Report & Implement Specified L3 Treatment
     - No
       - No

6. Engineering Report & Implement Specified L3 Treatment

7. No

8. **Facility-Specific Evaluation**
   - Establish Maximum Reasonable Treatment

9. AKART Achieved

10. Engineering Report & L3 Upgrades or Polishing

11. Meeting ISGP Benchmarks?
    - Yes
      - Engineering Report
      - Engineering Report
    - No
      - No

12. **Trigger L1, L2**
    - Apply Additional Operational & Structural Source Control BMPs

13. **Trigger L3**

14. Engineering Report & L3 Upgrades or Polishing

15. Request Modification of Permit Coverage if applicable

Identifier corresponding to the item description included in Section 2.1.

(1) L1, L2, L3 = Corrective Action Levels defined in ISGP

(2) Treatment technologies evaluated to be appropriate for reducing specific pollutant concentrations will be categorized based on measured or estimated removal capability. See Sections 4 & 5.

\( C_{\text{high}}, C_{\text{medium}}, C_{\text{low}} = \text{Pollutant Concentration Ranges} \)

\( T_1, T_2, T_3 = \text{Specified Treatment Technology Options} \)

(3) Engineering Report reviewed and approved by Ecology including a statement expressing sound engineering justification that the treatment proposed is reasonably expected to meet the goal of achieving ISGP benchmarks in future facility discharges and documenting that AKART will be achieved based on procedures and evaluations set for this guidance document.

V16 – 04/30/14
Define Operational & Structural Source Control

- Listed in the SWMMWW
- Mandatory ISGP BMPs
- Other states & industries
- Work w/MTOs & others
- List what works but isn’t widely “Known”

START
Apply Mandatory Operational & Structural Source Control BMPs from ISGP & SWMM, or Equivalent

INDUSTRIAL STORMWATER GENERAL PERMIT

A National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated With Industrial Activities

State of Washington Department of Ecology
Olympia, Washington 98504-7000

In compliance with the provisions of The State of Washington Water Pollution Control Law Chapter 90-48 Revised Code of Washington and The Federal Water Pollution Control Act (The Clean Water Act) Title 33 United States Code, Section 1251 et seq.

Until this permit expires, is modified or revoked, Permittees that have properly obtained coverage under this general permit are authorized to discharge in accordance with the special and general conditions which follow.
Define “Reasonable” Treatment

- Identify technologies
- Many traditional approaches are not considered to be feasible at Marine Terminals
- Manual lists most “Known” proprietary technologies
Defining “Reasonable” Treatment

- Concentration Based Evaluation (Sections 4 & 5)
- Look at Tables in Appendix C

### Table C-3

<table>
<thead>
<tr>
<th>Manufacturer/Vendor</th>
<th>Treatment BMP</th>
<th>BMP Source</th>
<th>Process</th>
<th>Technology Type</th>
<th>Conditions Treated</th>
<th>Total Zinc</th>
<th>DISsorbed Zinc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial Filtration Systems</td>
<td>Axial Filter</td>
<td>Membrane Filtration</td>
<td>Filtration Device</td>
<td>60%</td>
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<td></td>
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<tr>
<td>Axial Filtration Systems</td>
<td>Axial Media Filter</td>
<td>Membrane Filtration</td>
<td>Filtration Device</td>
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<td></td>
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<tr>
<td>Lean Environment</td>
<td>Epispon Metal Treatment</td>
<td>Emerging Tech</td>
<td>Media Filtration</td>
<td>90%</td>
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<tr>
<td>OilTap Environmental</td>
<td>OilTap Environmental Scrubbing</td>
<td>Membrane Filtration</td>
<td>Electrocoagulation</td>
<td>90%</td>
<td></td>
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<td></td>
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<tr>
<td>BioClean Environmental</td>
<td>BioClean Environmental</td>
<td>Membrane Filtration</td>
<td>Granule Removal</td>
<td>90%</td>
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<td></td>
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<tr>
<td>Watekonic</td>
<td>WaveBonic</td>
<td>Membrane Filtration</td>
<td>Electrocoagulation</td>
<td>85%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>StormwaterRx</td>
<td>Perforated Stormwater Polishing System</td>
<td>Membrane Filtration</td>
<td>Chemical</td>
<td>85%</td>
<td></td>
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<tr>
<td>StormwaterRx</td>
<td>Stormwater Rx</td>
<td>Membrane Filtration</td>
<td>Solids Reduction</td>
<td>85%</td>
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<td>Contech</td>
<td>Urban Green BioFilter</td>
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<td>Filtration Device</td>
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<tr>
<td>Environment 21</td>
<td>PureForm</td>
<td>Membrane Filtration</td>
<td>Cartridge</td>
<td>60%</td>
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<td></td>
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<tr>
<td>BioClean Environmental</td>
<td>Bioclean Cuts Last Basket</td>
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<td>Cartridge</td>
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<td>BioClean Environmental</td>
<td>Modular Wetland/Linear Flow</td>
<td>Emerging Tech</td>
<td>Membrane Filtration</td>
<td>75%</td>
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<td>ADS Water Quality Unit</td>
<td>ADS Water Quality Unit</td>
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<tr>
<td>Fluid International</td>
<td>Fluid International</td>
<td>Membrane Filtration</td>
<td>VFD</td>
<td>75%</td>
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<tr>
<td>Contech/Endurance Systems</td>
<td>JyllFire</td>
<td>Emerging Tech</td>
<td>Filtration Device</td>
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<td>Environment 21</td>
<td>UCFS Treatment System</td>
<td>Emerging Tech</td>
<td>Hydrodynamic Siphon</td>
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<td>BioClean Environmental</td>
<td>BioClean Environmental Dewatering Filter</td>
<td>Emerging Tech</td>
<td>Cartridge</td>
<td>60%</td>
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<td>Coanda</td>
<td>Coanda Dewatering Filter</td>
<td>Emerging Tech</td>
<td>Cartridge</td>
<td>60%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Coanda</td>
<td>Coanda Cartridge Filter</td>
<td>Emerging Tech</td>
<td>Cartridge</td>
<td>60%</td>
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<td></td>
<td></td>
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<tr>
<td>Contech</td>
<td>Water Filtration System</td>
<td>Emerging Tech</td>
<td>Membrane Filtration</td>
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<td>Contech</td>
<td>Stormfilter with ZPO Media</td>
<td>Emerging Tech</td>
<td>Membrane Filtration</td>
<td>30%</td>
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<td>Kontor Enterprises</td>
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<td>Emerging Tech</td>
<td>Membrane Filtration</td>
<td>50%</td>
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<tr>
<td>Kontor</td>
<td>RoGard Dewatering Filter</td>
<td>Emerging Tech</td>
<td>Cartridge</td>
<td>50%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Permits are encouraged to investigate all of the stormwater treatment technologies and approaches listed in Table C-3 that may be appropriate to reduce facility stormwater discharge pollutants to below "ISGP benchmark" levels. Several non-proprietary approaches are included in Table C-1 that do not appear in this table as applicable pollutant reduction data for all of the stormwater treatment BMPs listed in Table C-3 were not readily available. Permits should focus on the qualitative and quantitative criteria discussed in Section 5 of this Manual considering site feasibility, specific pollutants to be addressed, capital and O&M cost considerations, as well as the sustainability of approach when selecting appropriate stormwater treatment BMPs for implementation at their facilities. Incorporation of Low Impact Development (LID) green infrastructure principals should be considered first, to maximize overall environmental benefits and to limit adverse environmental impacts resulting from Level 3 Corrective Actions. In many cases, the correct stormwater treatment strategy to address ISGP Level 3 Corrective Action requirements will include non-proprietary solutions.
Defining “Reasonable” Treatment

• Are the treatment approaches “Reasonable”?

• Qualitative & Quantitative Evaluations
  ❖ Capacity to achieve benchmarks
  ❖ Adaptability
  ❖ Required conveyance improvements
  ❖ Operational space
  ❖ Capital costs
  ❖ O&M Costs

• Facility-Specific Evaluation
Cost/Benefit (Knee-Of-the-Curve) Evaluation

- Prepare cost estimates for multiple treatment approaches (one or more carrying GULD)
- Calculate constructed cost/gallon per minute of treatment capacity
- Plot the costs vs. pollutant reduction efficiency
- Select the approach to the left of the knee of the curve
Ecology commends the WPPA, and its member ports for their good faith efforts to comply with ISGP requirements, and for actively engaging Ecology to develop the Manual. We also applaud the valuable input from key advocacy groups for both industry and the environment during the development of the Manual including: marine terminal operators, the Pacific Merchant Shipping Association, Puget Soundkeeper Alliance, Washington Environmental Council, and Citizens for a Healthy Bay. We look forward to working with WPPA and the Washington port community stakeholders to implement and update the Manual to ensure that it continues as a relevant and useful tool for marine terminals to effectively manage stormwater in compliance with the ISGP.

Sincerely,

Maia D. Bellon
Director

Furthermore, a facility that follows the pathway to compliance and receives Ecology approval of the facility’s chosen stormwater treatment approaches (through approval of Engineering Reports prepared in accordance with Ecology guidelines, as required), will be understood to have implemented AKART to the satisfaction of Washington State standards.