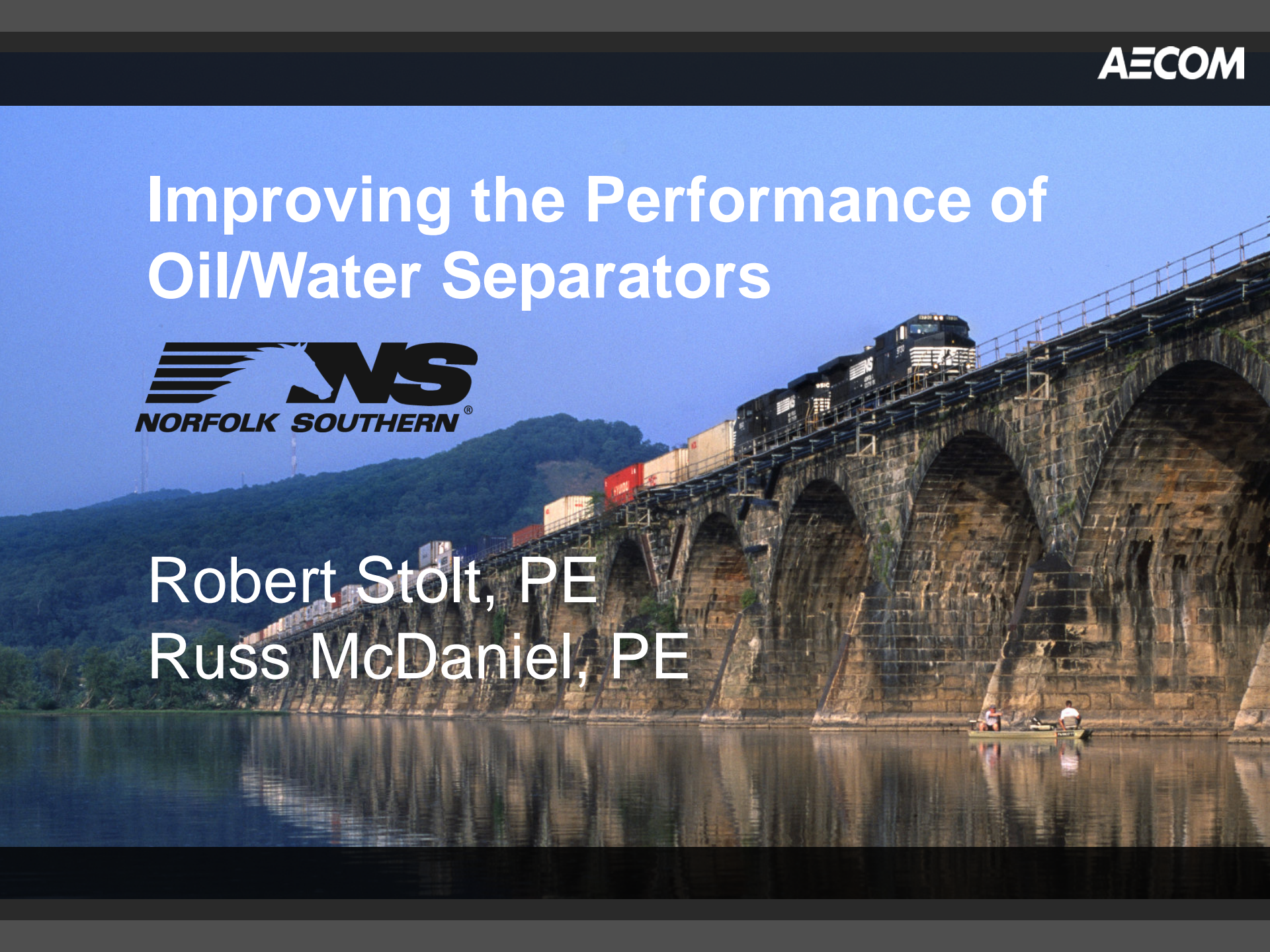


Improving the Performance of Oil/Water Separators



Robert Stolt, PE
Russ McDaniel, PE



Presentation Outline

1. Types of Oil/Water Separators
2. Types of Oil Skimming Devices
3. Improvements to a Steel “Frac” Tank OWS in PA
4. Improvements to a Conventional API OWS in PA
5. Observations/Lessons Learned
6. Questions

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Types of Oil/Water Separators

- Above Ground API Oil/Water Separators
 - API Publication 421, *Design and Operation of Oil-Water Separators*
 - Concrete Tanks
 - Rectangular Steel “Frac” Tanks
- Underground Oil/Water Separators
 - Cylindrical Steel Tanks
- Oil Baffles

Above Ground API Oil/Water Separators

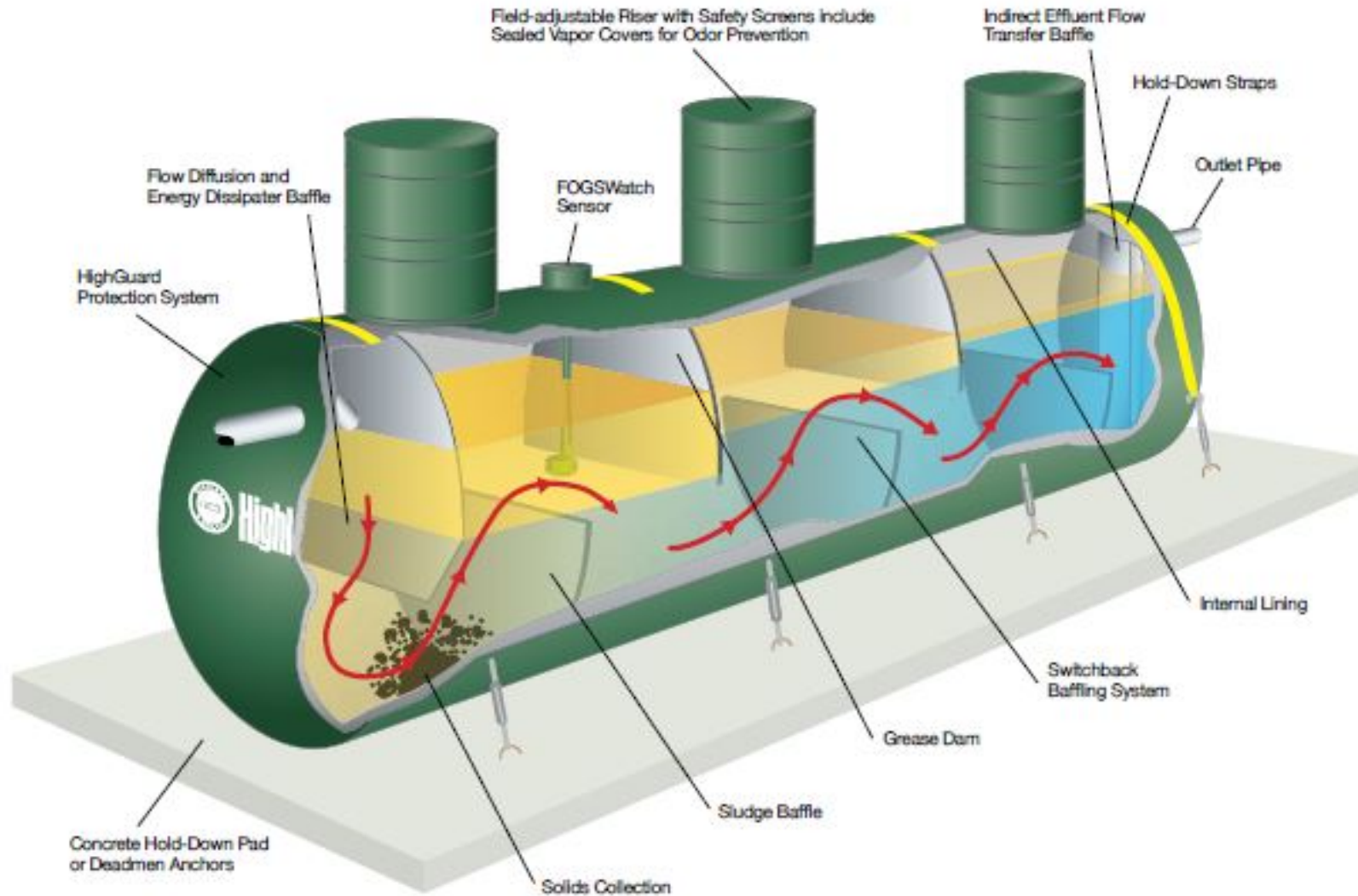


Concrete Tanks

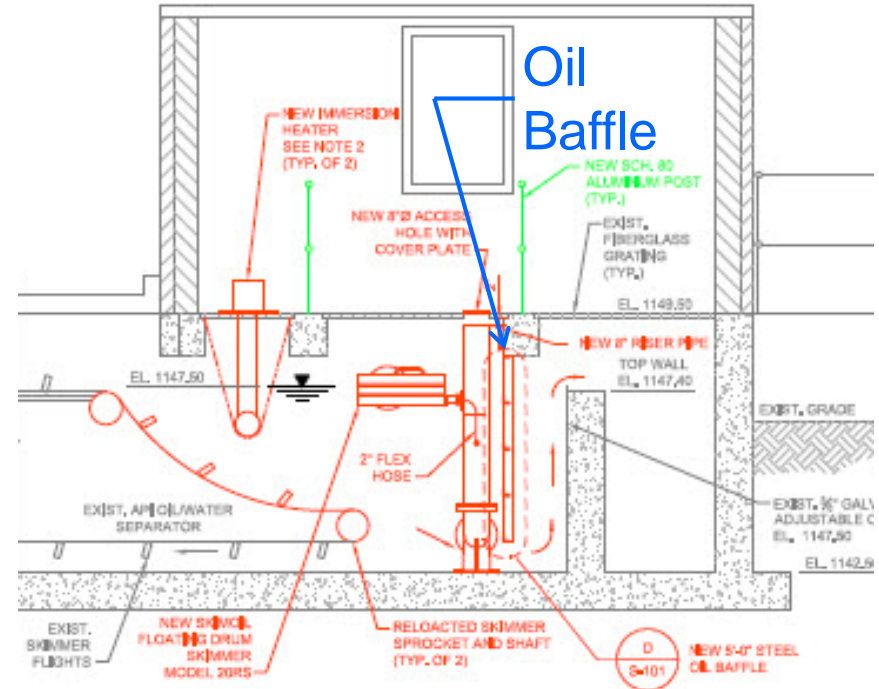
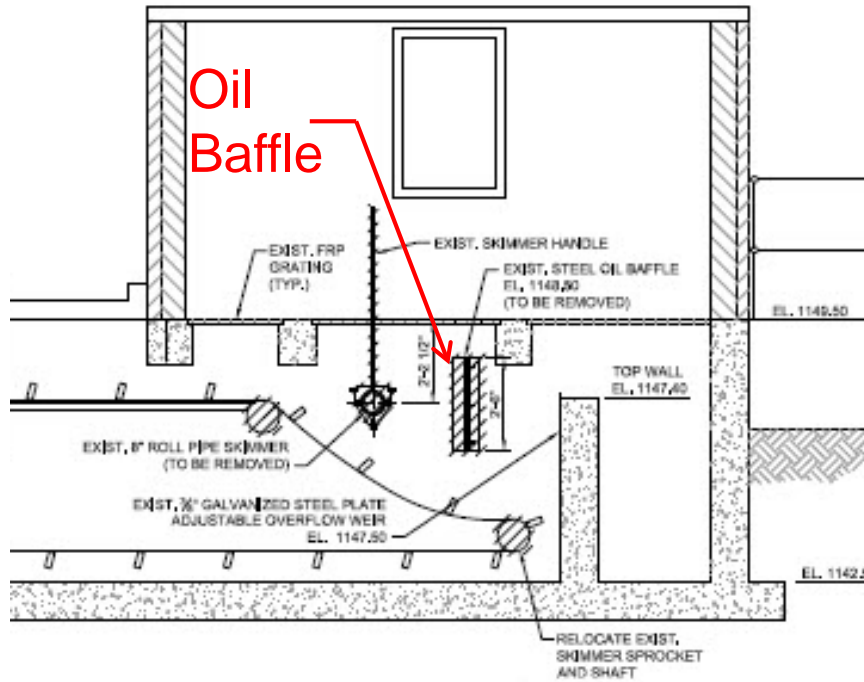


Rectangular Steel "Frac" Tanks

Underground Oil/Water Separator



Oil Baffles



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Types of Oil Skimming Devices

- Rotating Oil Skimmer Pipes
- Floating Oil Skimmers
- Rope-type Oil Skimmers
- Belt-type Oil Skimmers
- Drum-type Oil Skimmers

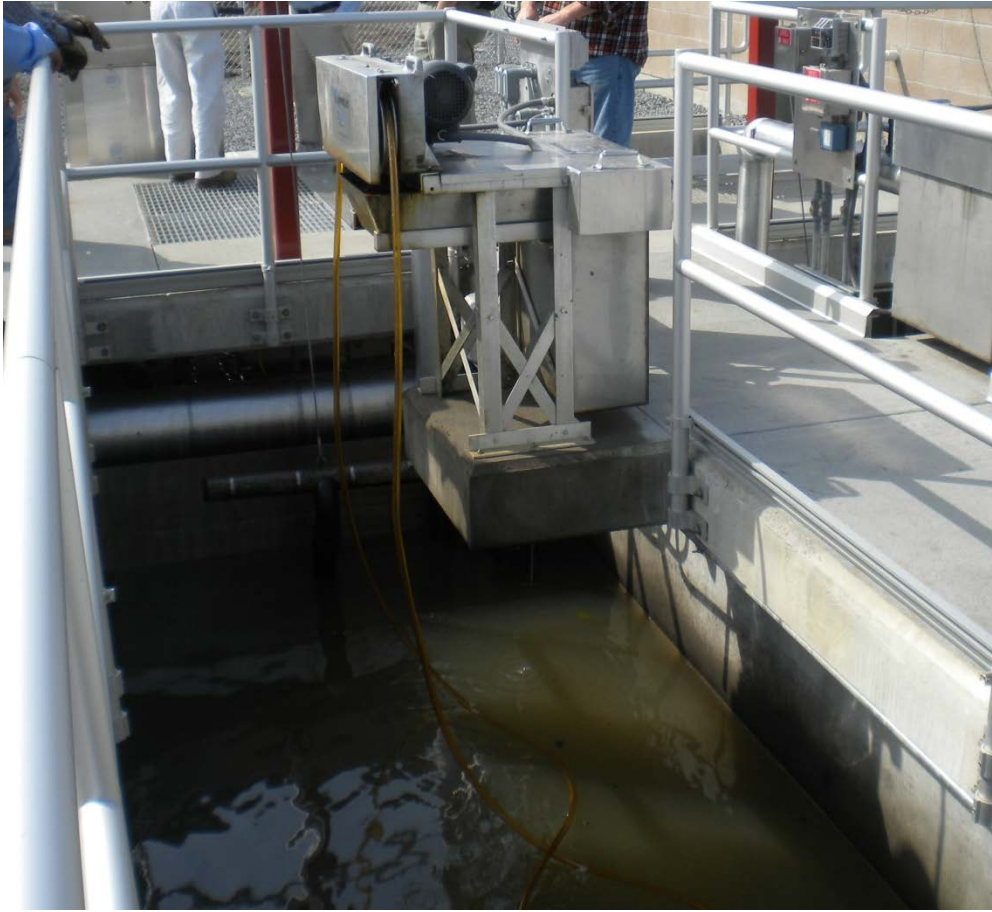
Rotating Oil Skimmer Pipes



Floating Oil Skimmers (Megator)



Rope-type Oil Skimmers



Belt-type Oil Skimmers



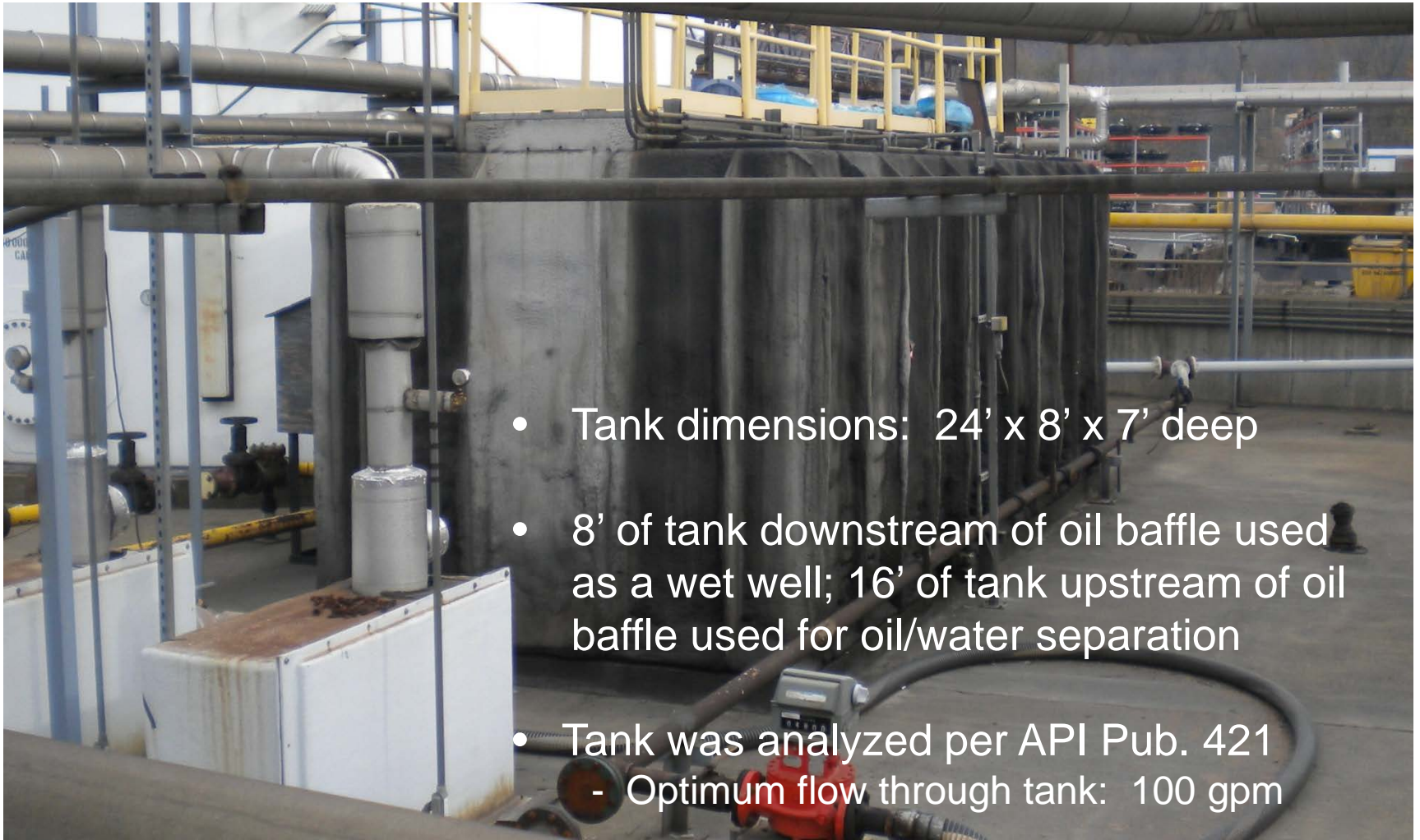
Drum-type Oil Skimmers



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Improvements to a Steel “Frac” Tank OWS in PA



- Tank dimensions: 24' x 8' x 7' deep
- 8' of tank downstream of oil baffle used as a wet well; 16' of tank upstream of oil baffle used for oil/water separation
- Tank was analyzed per API Pub. 421
 - Optimum flow through tank: 100 gpm

Baffle Modifications: Convert "Over" Baffle to Oil Baffle



Presentation Outline

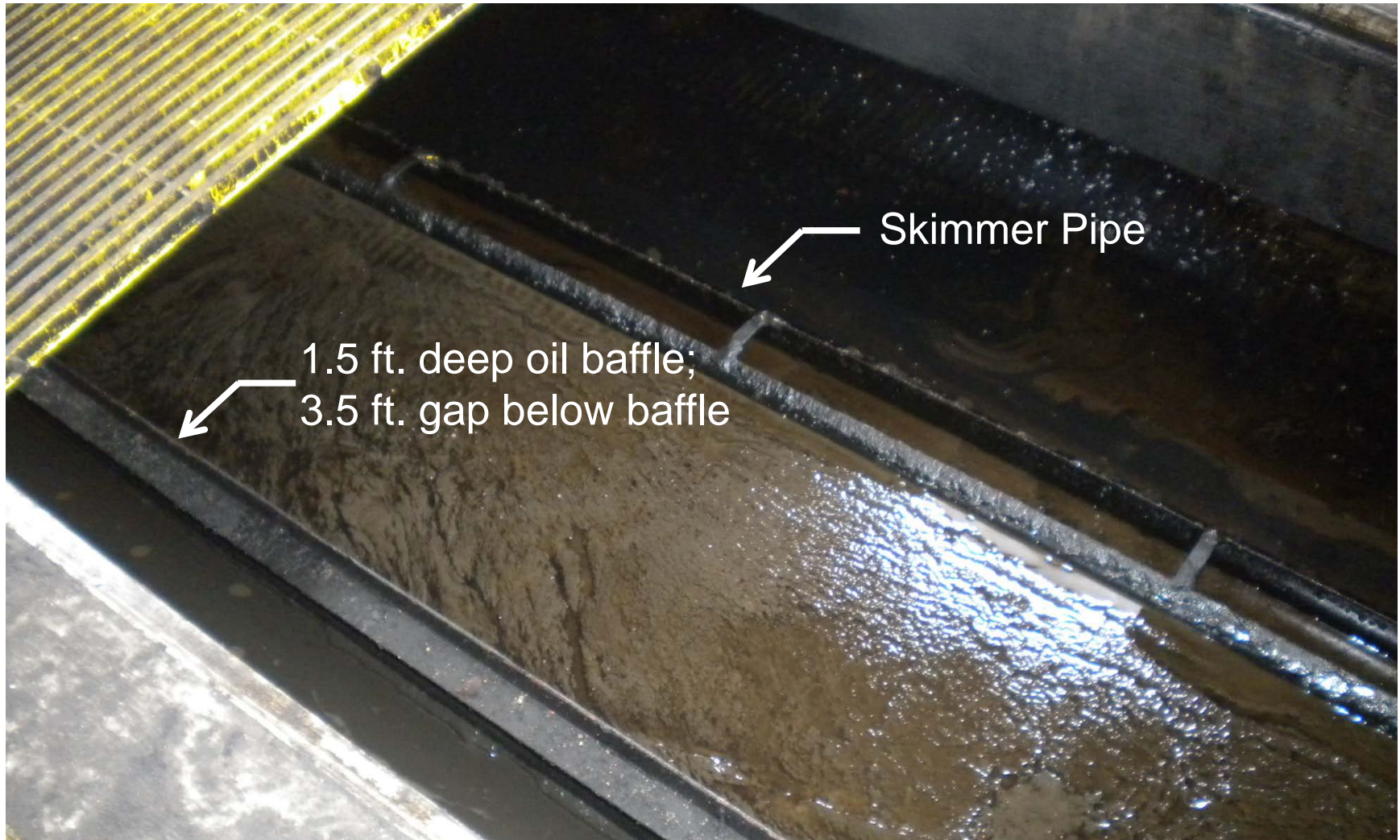
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Improvements to a Conventional API OWS in PA

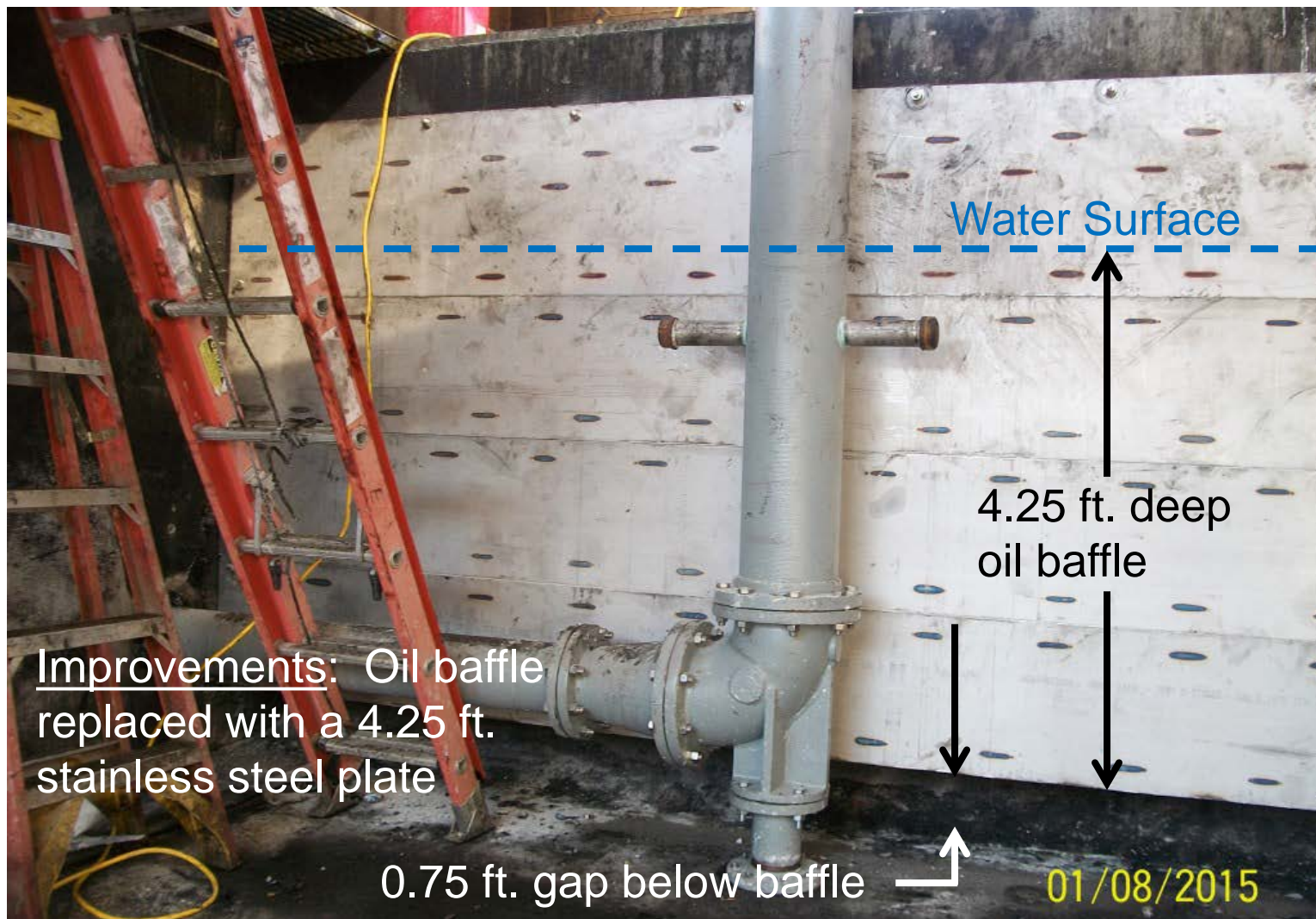


- Tank dimensions: 96' x 12' x 5' deep
- Oil transferred to end of tank via a chain & flight oil collection system
- Oil collected via an 8" dia. rotating skimmer pipe

Rotating 8" dia. Oil Skimmer Pipe



Baffle Modifications



Skimming Pipe Replaced with 2 Drum Skimmers



Improvements: Rotating skimmer pipe replaced with drum
2 hydraulically driven drum skimmers

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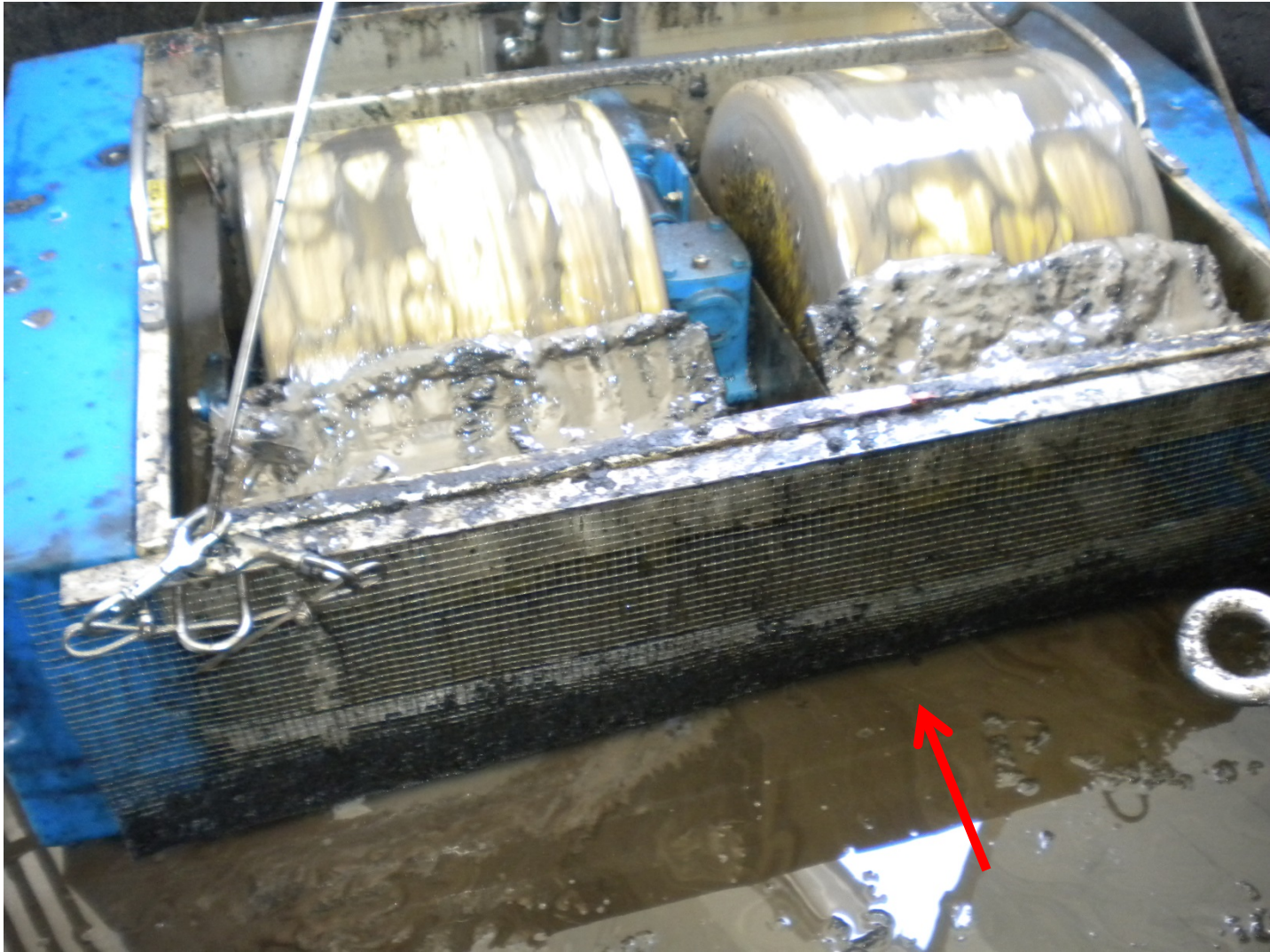
Observations/Lessons Learned

- Improved oil removal in API Tanks improves treatment of subsequent treatment units
- Floating debris can affect performance of oil removal equipment
 - Screens can improve operation of oil removal equipment and reduce debris transferred to Used Oil Storage Tanks
- New windows and a fresh coat of paint can improve operator morale

Added Basket Screen to Steel "Frac" Tank OWS



Added Screening Device to Drum Skimmer



Window Replacement & Fresh Coat of Paint in API Bldg.



Questions

