

Kennedy/Jenks Consultants

Engineers & Scientists

***New Methods for
More Efficient
Granular Media Filter
Evaluations***

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2008 PNWS - AWWA Conference

VANCOUVER WASHINGTON

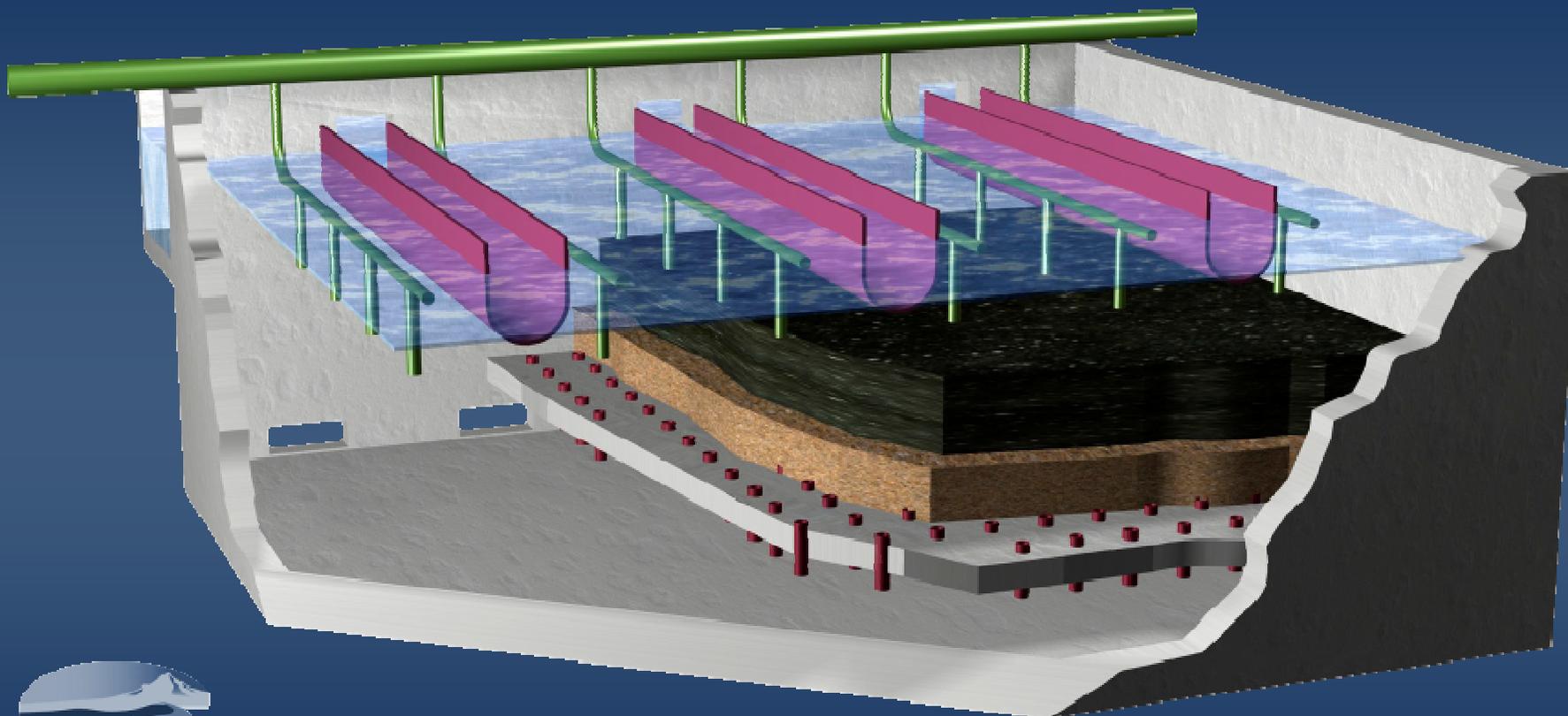
Introduction



- ▼ Techniques for evaluating the condition of granular media filters
- ▼ Introduce two new methods, less interruptive
 - Fiber optic camera and video
 - Conductivity probe



Filter Schematic



Air Scour



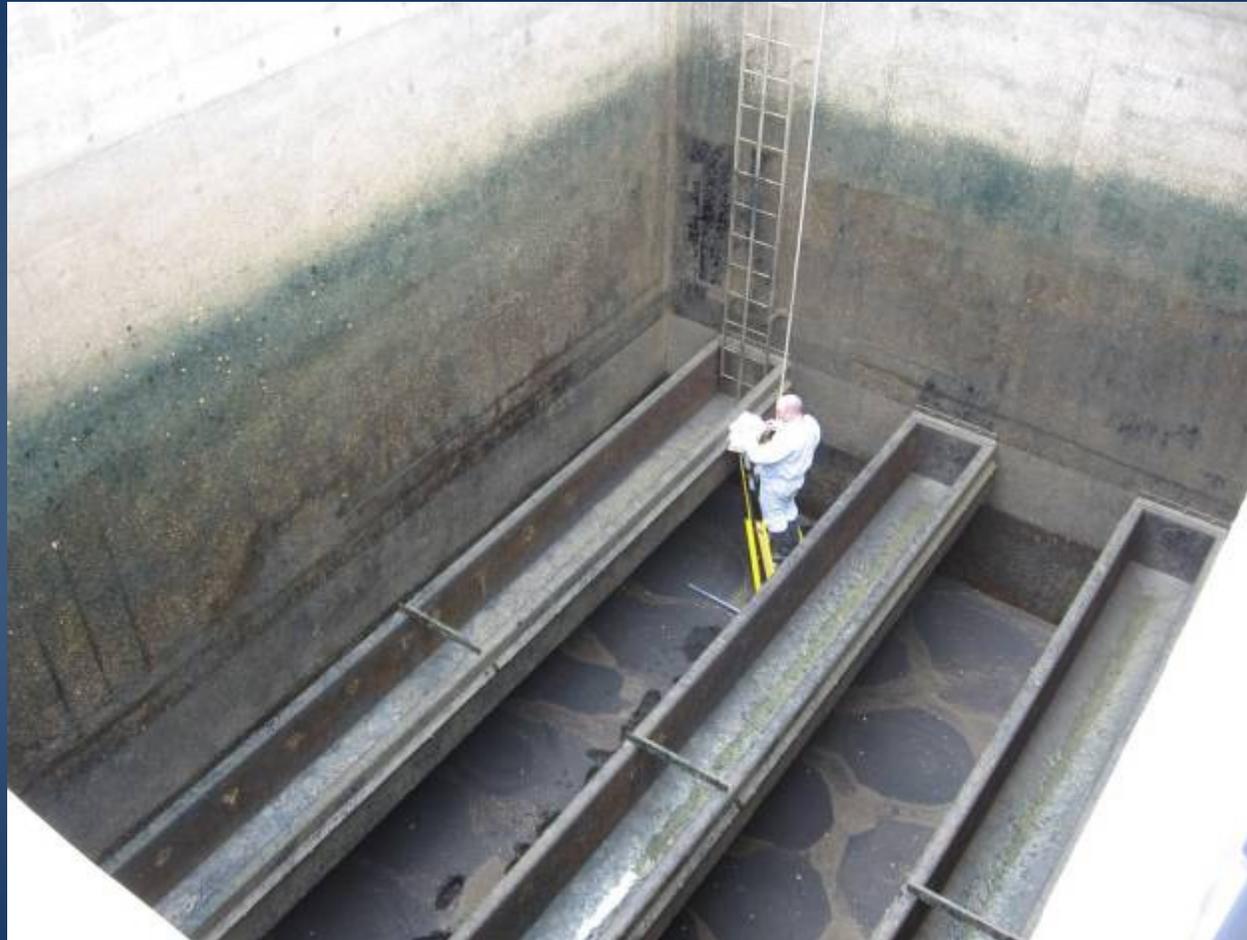
High Rate Wash (Conventional)



Level Troughs (In-Line Filtration)



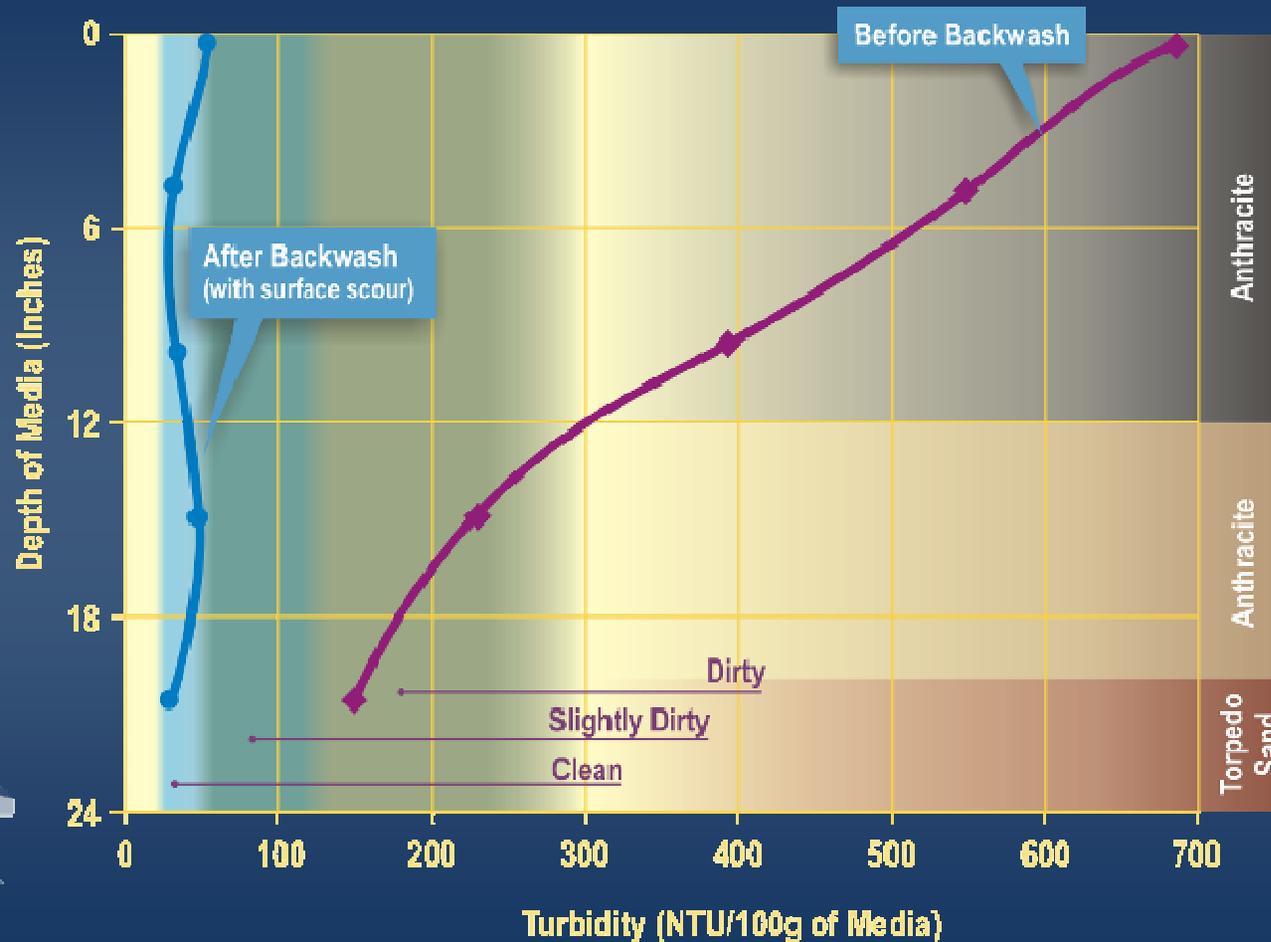
Filter Media Coring



Media Sample Collection



Floc Retention Profile



New Filter Evaluation Techniques



- ▼ Fiber Optic Camera
- ▼ Conductivity Probe



Filter Probing



Conductivity and Camera Probes



Camera with Fiber Optic Cable and Light



Camera Controller



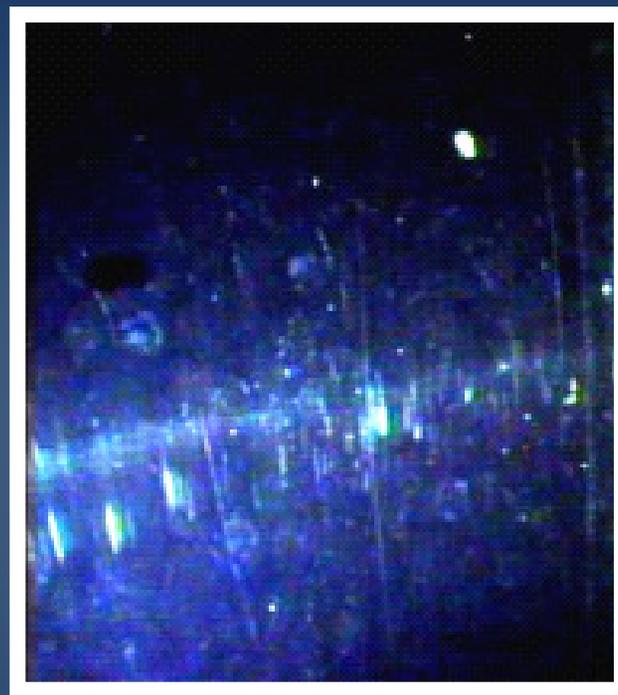
Viewer



Fiber Optic Camera Results



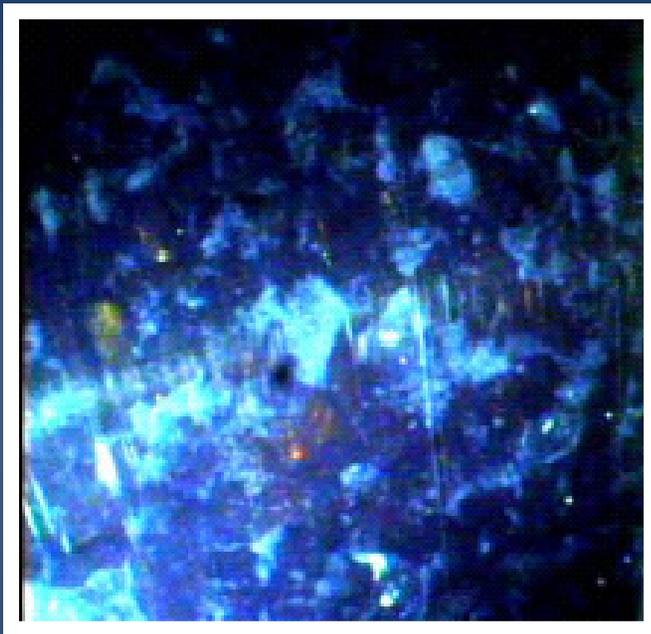
Fiber Optic Camera Photos



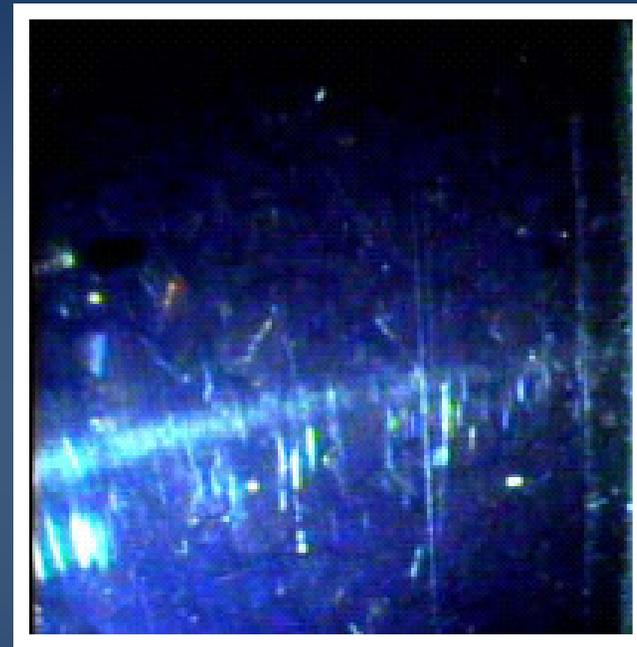
*Top of Media
Prior to Wash*

*Top of Media
After Wash*

Fiber Optic Camera Photos



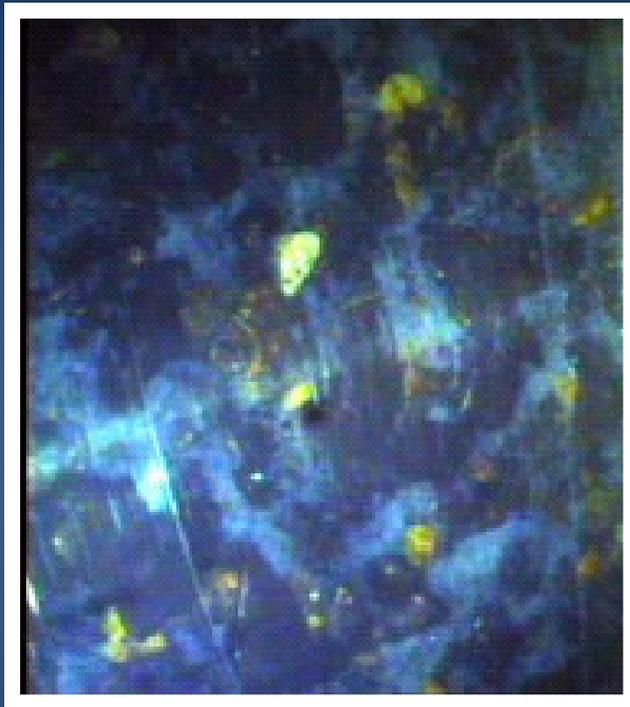
*2-inch Depth
Prior to Wash*



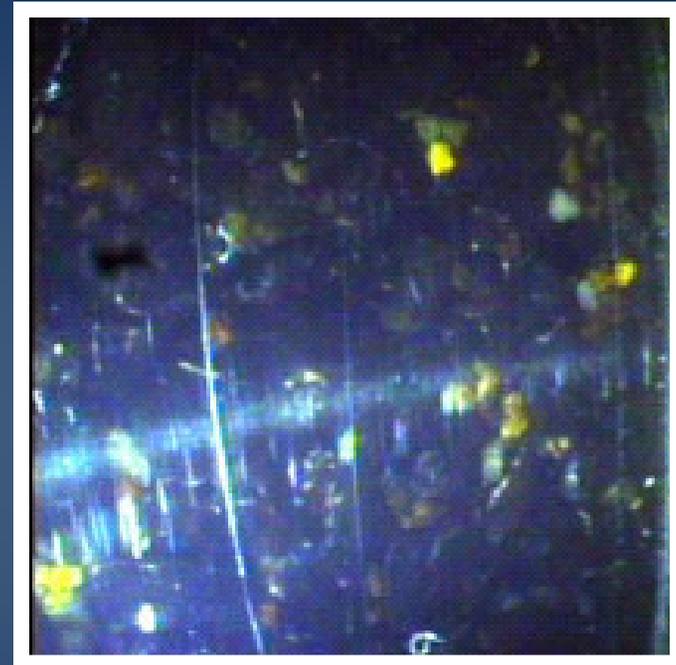
*2-inch Depth
After Wash*



Fiber Optic Camera Photos



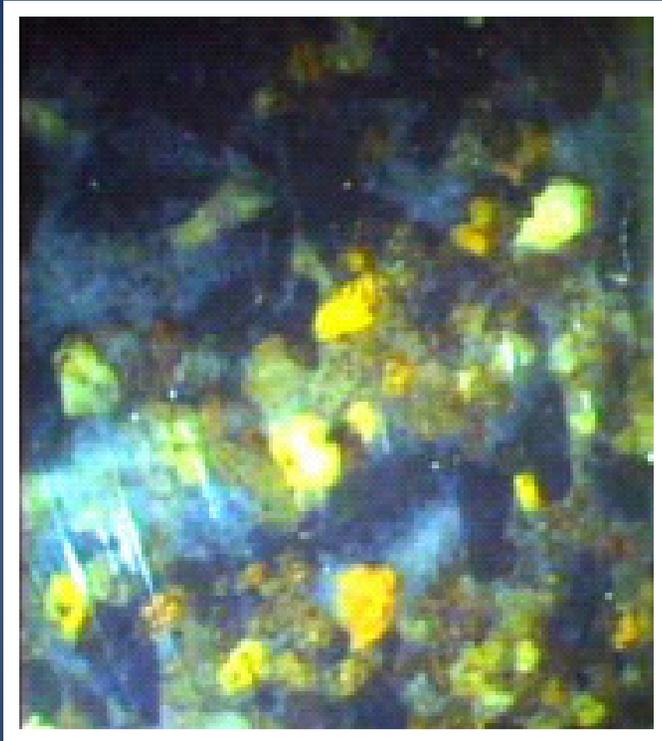
*10-inch Depth
Prior to Wash*



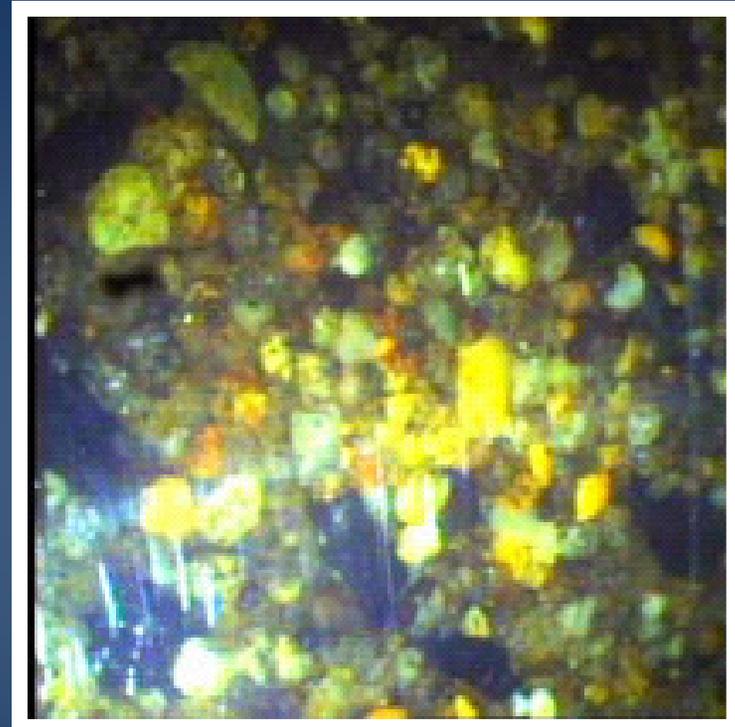
*10-inch Depth
After Wash*



Fiber Optic Camera Photos



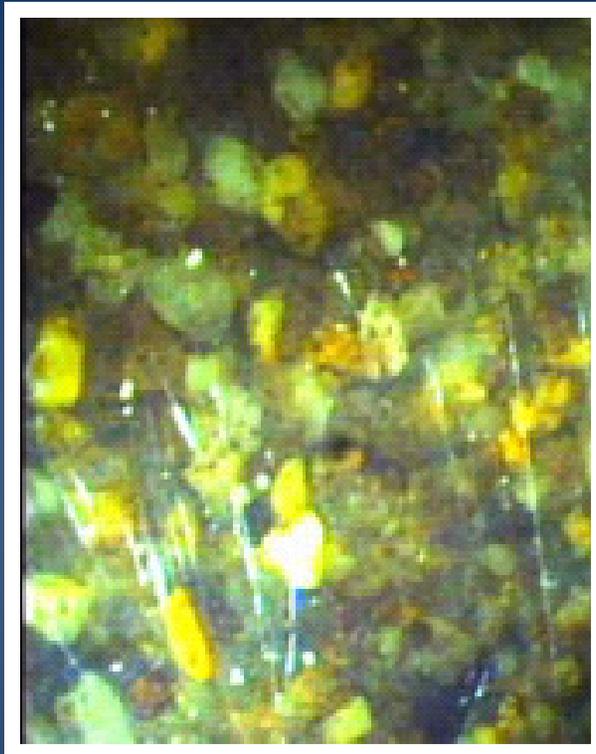
*12-inch Depth
Prior to Wash*



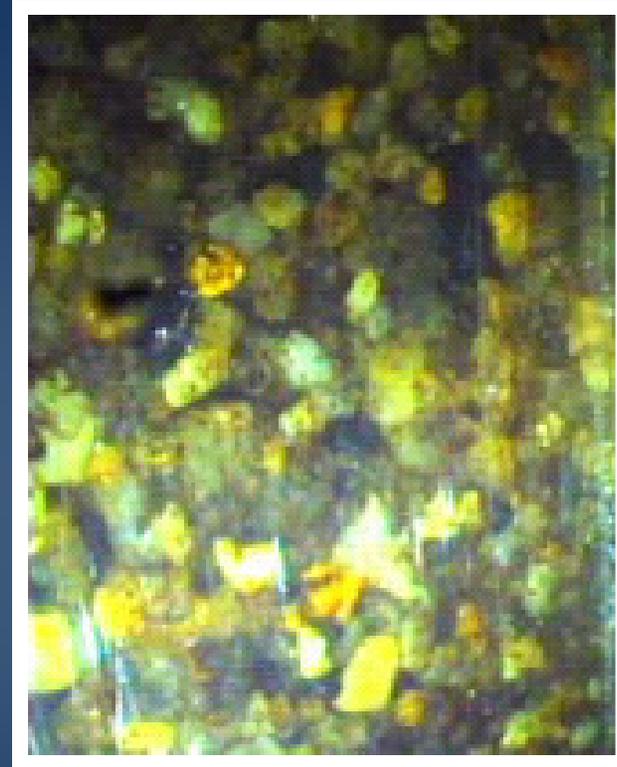
*12-inch Depth
After Wash*



Fiber Optic Camera Photos



*24-inch Depth
Prior to Wash*



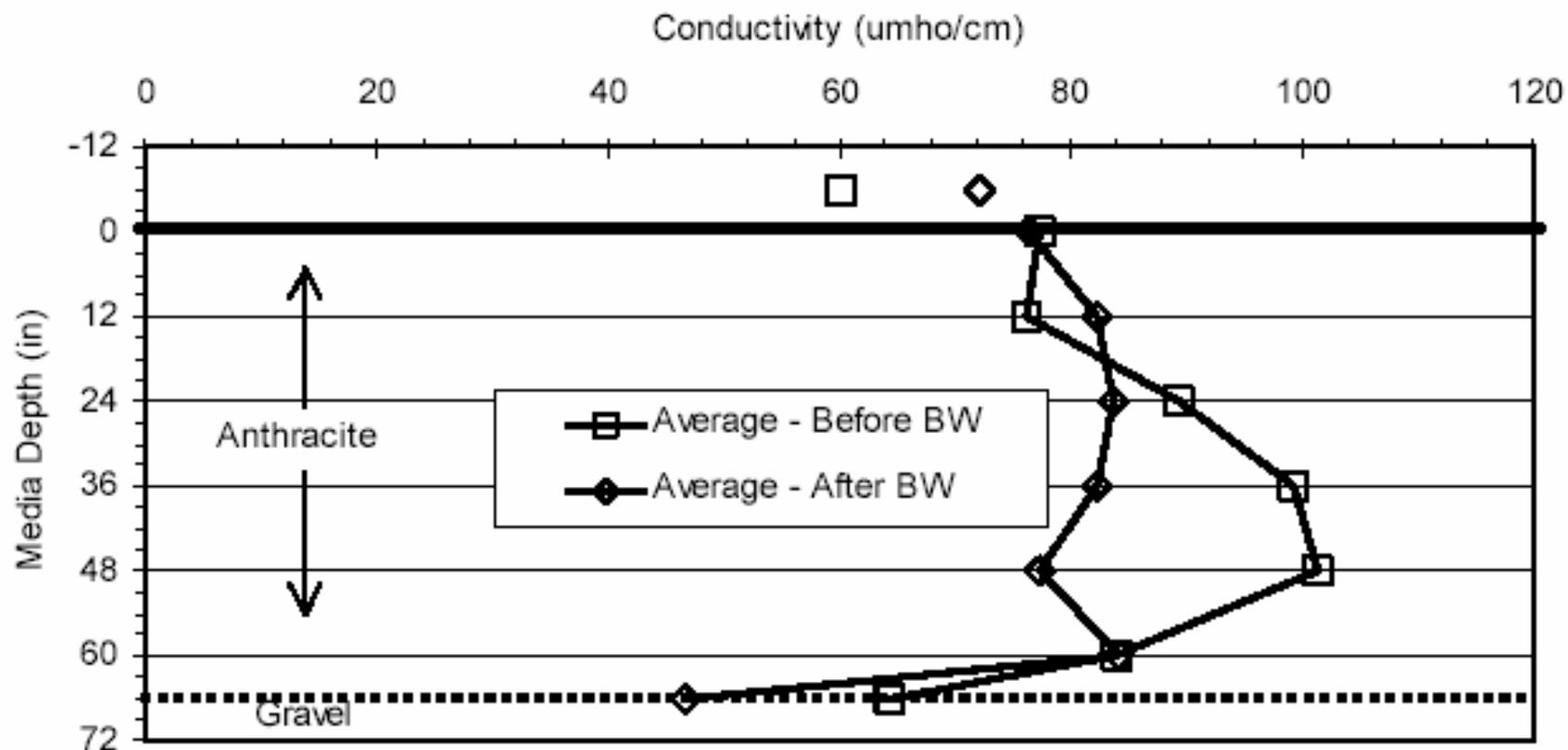
*24-inch Depth
After Wash*



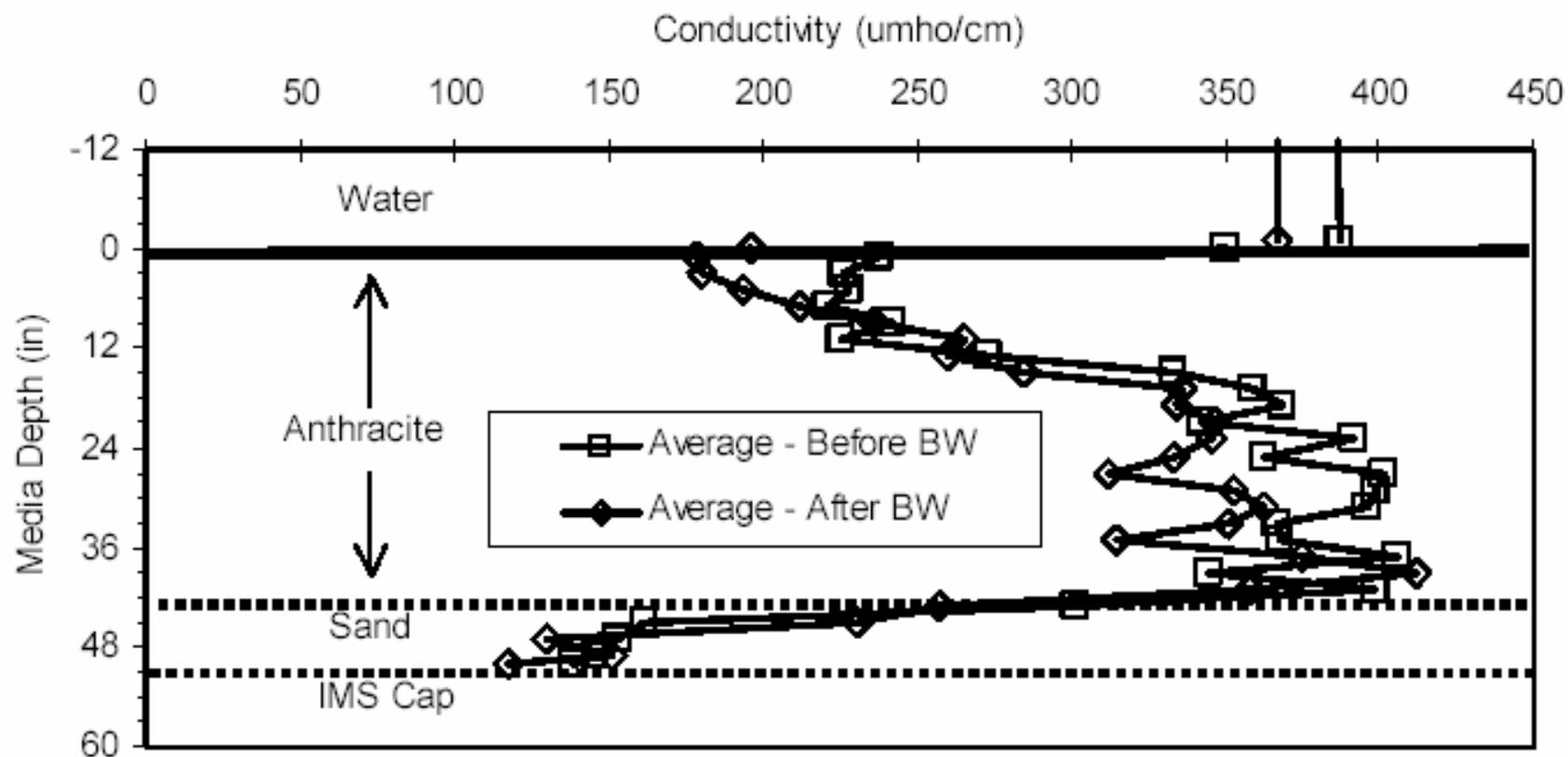
Conductivity Probe



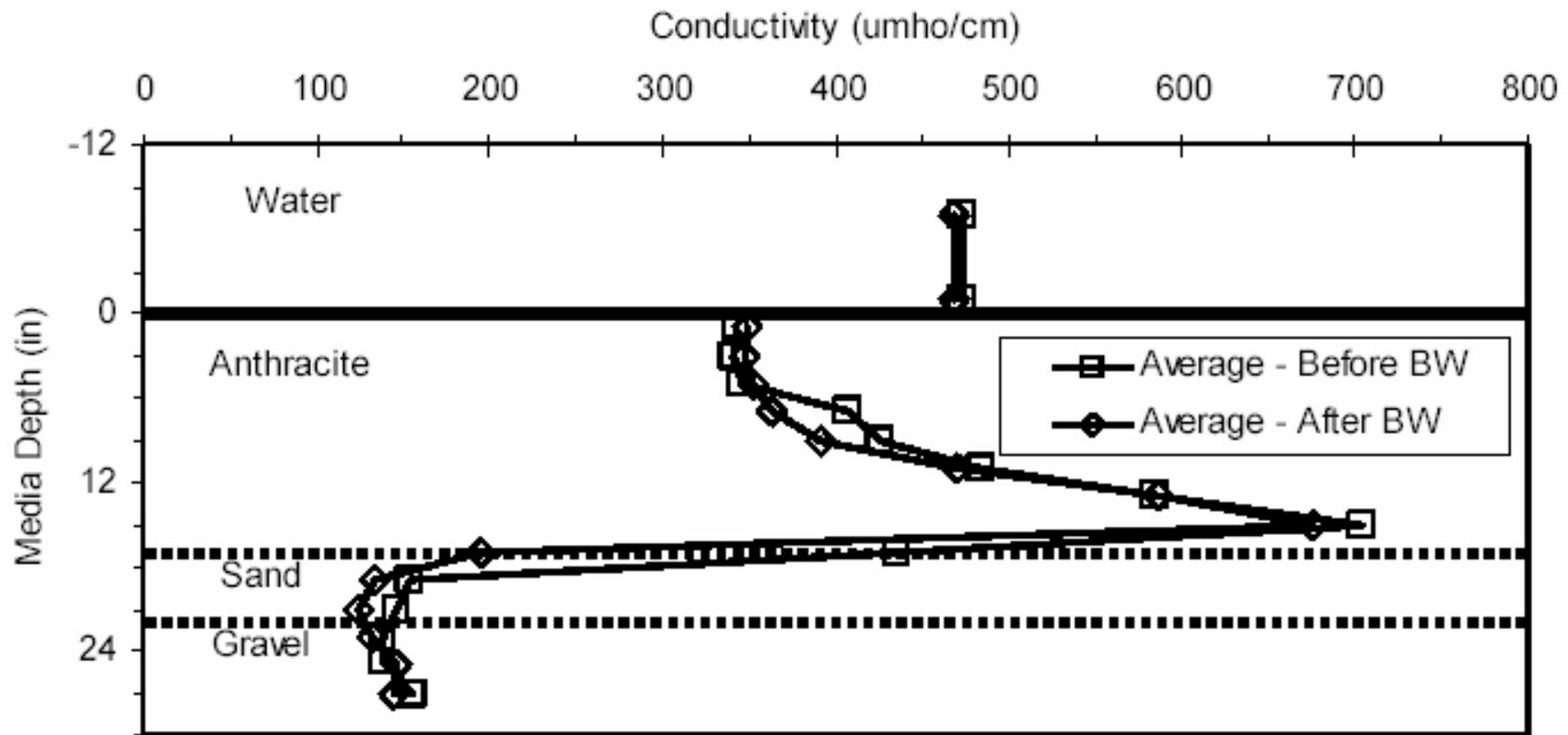
Conductivity Results for Site 1



Conductivity Results for Site 8

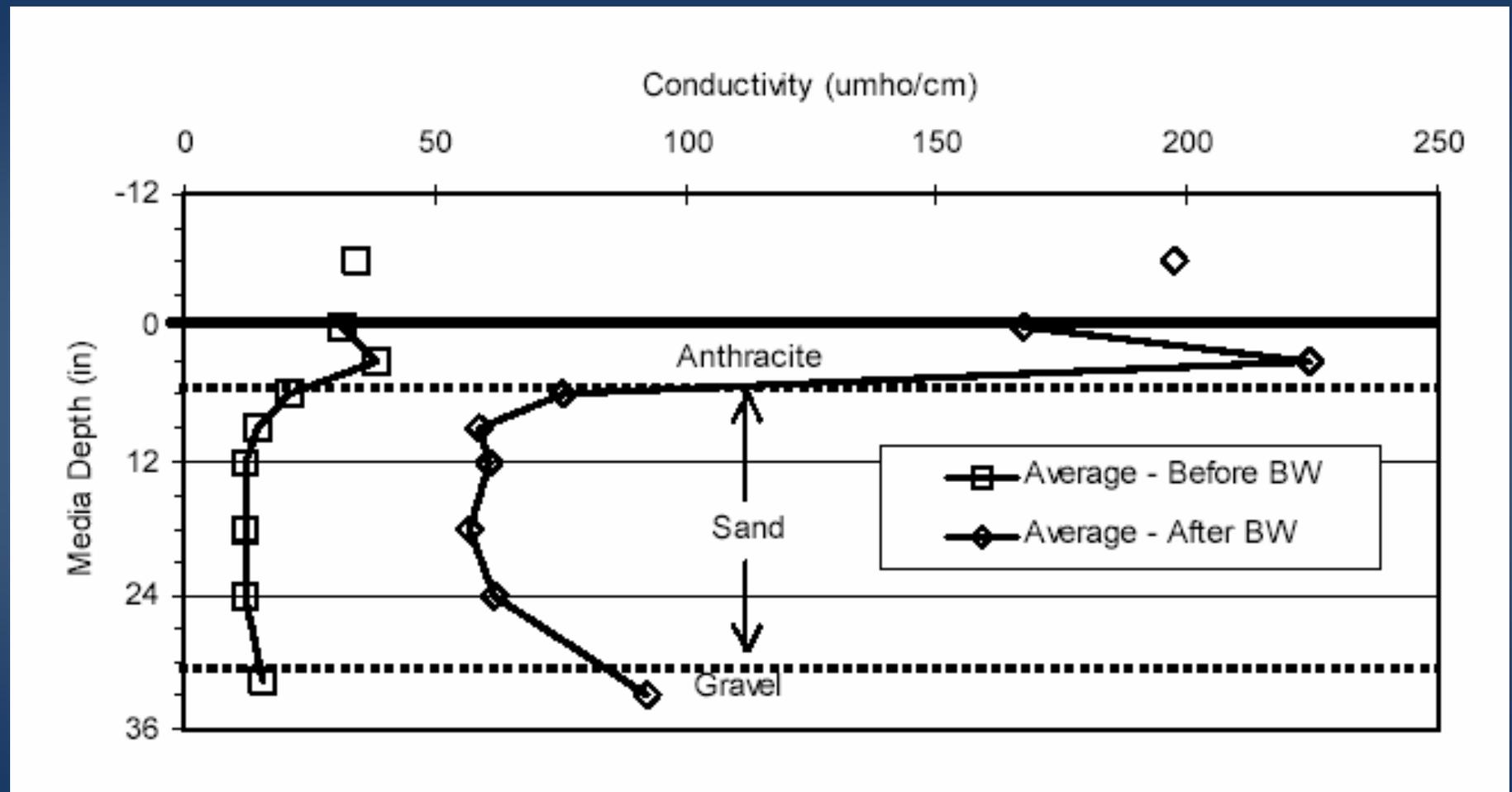


Conductivity Results for Site 7



01/17/2008

Conductivity Results for Site 2



Summary



- ▼ Two new in situ methods complement existing techniques
- ▼ Benefits of new methods:
 - Take less time, less interruptive
 - Avoid filter draining
 - Camera provides in situ view



Acknowledgements



- ▼ Funding provided by AwwaRF Project No. 2936 Traci Case, Project Manager
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Questions?

