



Using a PMP Approach to Attain TMDLs (An update to the PMP Approach to PCB Loading Reduction at Two Amtrak Facilities)

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Conference**

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Background

- In 2003, EPA developed TMDLs for polychlorinated biphenyls (PCBs) for the Delaware River Estuary
 - Target Water Quality Standards for PCBs ranged from 7.9 to 44.8 picogram/l (based on River Zone); recently updated to 16 picogram/l
- Review - Total Maximum Daily Load (TMDL) = maximum amount of a pollutant a water body can receive and still attain water quality standards
- TMDLs were to be implemented in a staged approach to allow loadings reductions to begin while refinement modeling and monitoring continued
- Significant impact to Amtrak storm water permits at Philadelphia and Wilmington facilities

Background (continued)

- PCBs may be detected at locations that were previously “non detectable”; Wilmington NPDES permit method detection limits:
 - 1992: 5 ppb- (aroclors – Method 8082)
 - 2000: 0.5 ppb (aroclors – Method 8082)
 - 2006 to Current: less than 5 pg/l (0.000005 ppb) (all 209 congeners – Method 1668A)
- The TMDLs were based on attaining WQS ranging from 7.9 pg/l to 44.8 pg/l, need to consider all inputs and boundary conditions, examples:
 - Atmospheric deposition (rain water can be greater than 1,000 pg/l)
 - Upgradient Sources (DE River above Trenton was greater than 1,000 pg/l)
 - Flux at ocean and C&D canal boundaries
 - Re-suspended historic sediments/river maintenance dredging
 - Dissolved PCBs

Delaware River

- Watershed area 12,765 square miles and includes NY, PA, NJ and DE
- Approximately 330 miles in length
- Water supply for 15 million people
- World-class trout fishery
- 20 significant tributaries, 144 point sources, 263 land based contaminated sites



Pollutant Minimization Plan (PMP) for PCBs

- In 2005, Delaware River Basin Commission (DRBC) adopted “Pollutant Minimization Plan for Toxic Pollutants” as a requirement of the Stage I TMDL
- DRBC requested PMPs from certain industrial and municipal dischargers; Amtrak joined the Delaware Estuary TMDL Coalition which included industrial and municipal dischargers
- PMP for PCBs was a NPDES permit requirement implemented at permit renewal (with non-numeric discharge limits)
- Initial goal of the PMP program was to reduce overall loading to the Estuary by 50%

Pollutant Minimization Plan (PMP) for PCBs (cont'd)

- DRBC established Guidelines for PMPs
- (Some) Plan Components
 - Good faith commitment (by high ranking official)
 - Identification of known and probable sources
 - Description of pollutant minimization measures with schedule
 - Measurement of Progress
 - Establish loading baseline
 - Ongoing measurement of mass loadings
 - Use Method 1668A (209 congeners; detection limit (DL) generally less than 5 pg/l)
 - Annual Reporting
 - To be submitted to DRBC and State agency
 - Track changes from loading baseline

Amtrak Wilmington Shops

- Wilmington Shops began operations in the early 1900's
- Operations for Wilmington Yard consisted primarily of maintenance, service and overhaul of locomotives, rail cars and equipment
- Electric train service began in 1930's, PCBs occurrence predominantly related to historic use of PCB dielectric fluids in transformers in electrified rolling stock



Amtrak Wilmington Shops

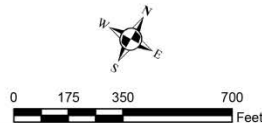
- PCB loading largely attributed to suspended solids in storm water runoff from affected exposed soils and rail ballast
- Prior to the PMP program, NPDES monitoring with permit-specified PCB (aroclor) analytical methods (Method 8082) reported “Non-Detectable” PCB concentrations with a detection limit of 0.5 ppb
- PCBs have been detected in exposed surface soils and visible oil seeps in ditches and storm sewers throughout the roughly 90 acre facility
- Ongoing remediation activities through State of Delaware Voluntary Clean-up Program, EPA Region 3 TSCA Program



Amtrak Wilmington Shops



AERIAL SOURCE: DELAWARE DATAMIL



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FOR: AMTRAK MAINTENANCE SHOPS VANDEVER AVENUE WILMINGTON, DELAWARE		FIGURE: STORM WATER OUTFALL LOCATIONS		FIGURE:
JOB NUMBER:	DRAWN BY: TFB	CHECKED BY:	APPROVED BY:	DATE: 07/06/2010

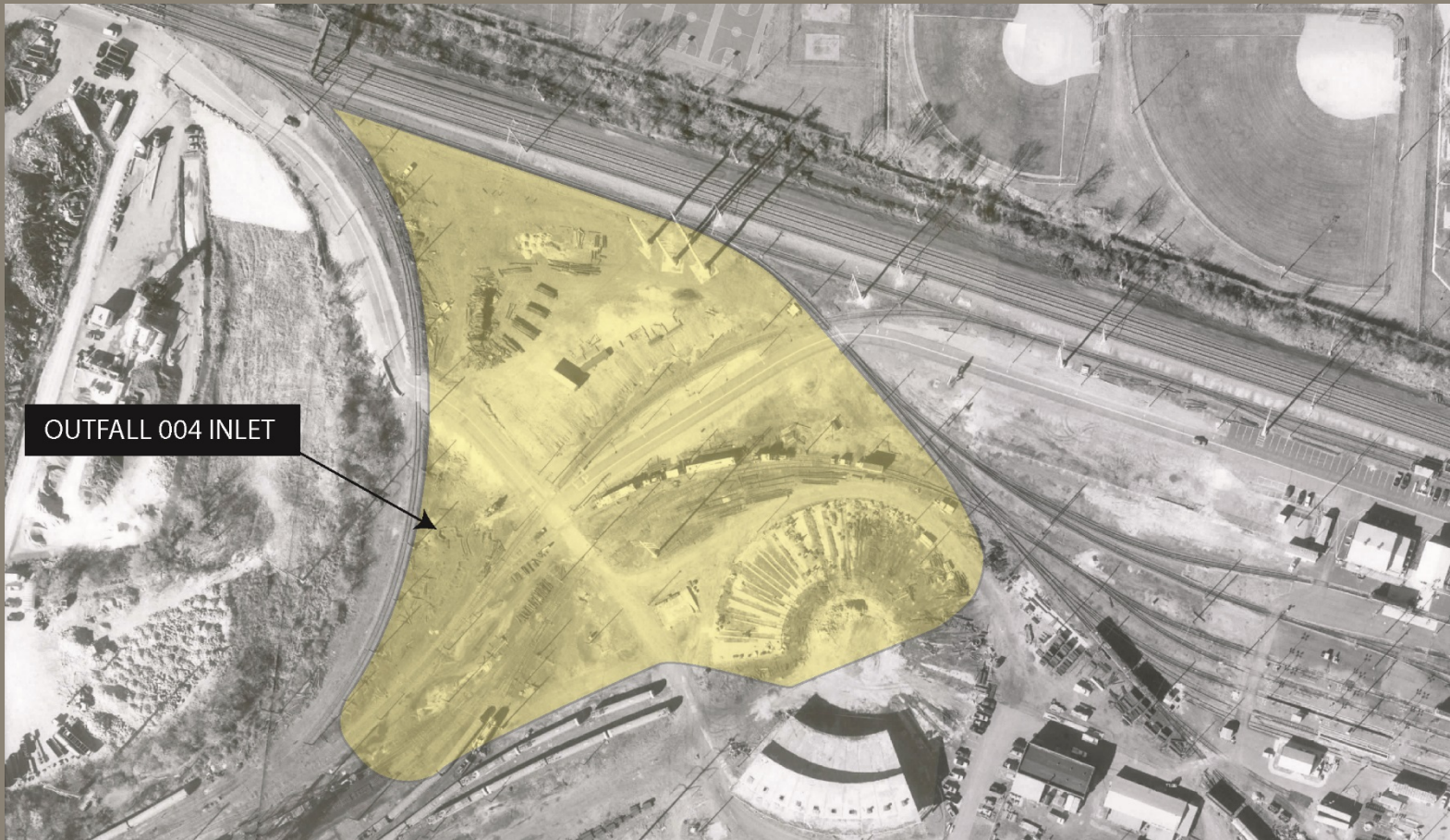
PCB Minimization Activities at Wilmington Shops - Before PMP Implementation

- Stationary transformers containing PCB fluids removed by 1983
- Metroliner and locomotive transformer dielectric fluid retrofilling activities were performed in the 1970s and 1980s
- The use of E-60 locomotives phase out
- The Maintenance Facility sewer systems were reconfigured in the 1980s - Industrial waste separate from stormwater
- Work pits below cars and locomotives were sealed in the 1980s and connected to the industrial sewer system
- Asphalt or concrete paving and surface capping placed on road surface and parking areas reducing the potential for erosion of soils
- Performed multiple soil excavation activities , periodic maintenance, construction projects and facility upgrades

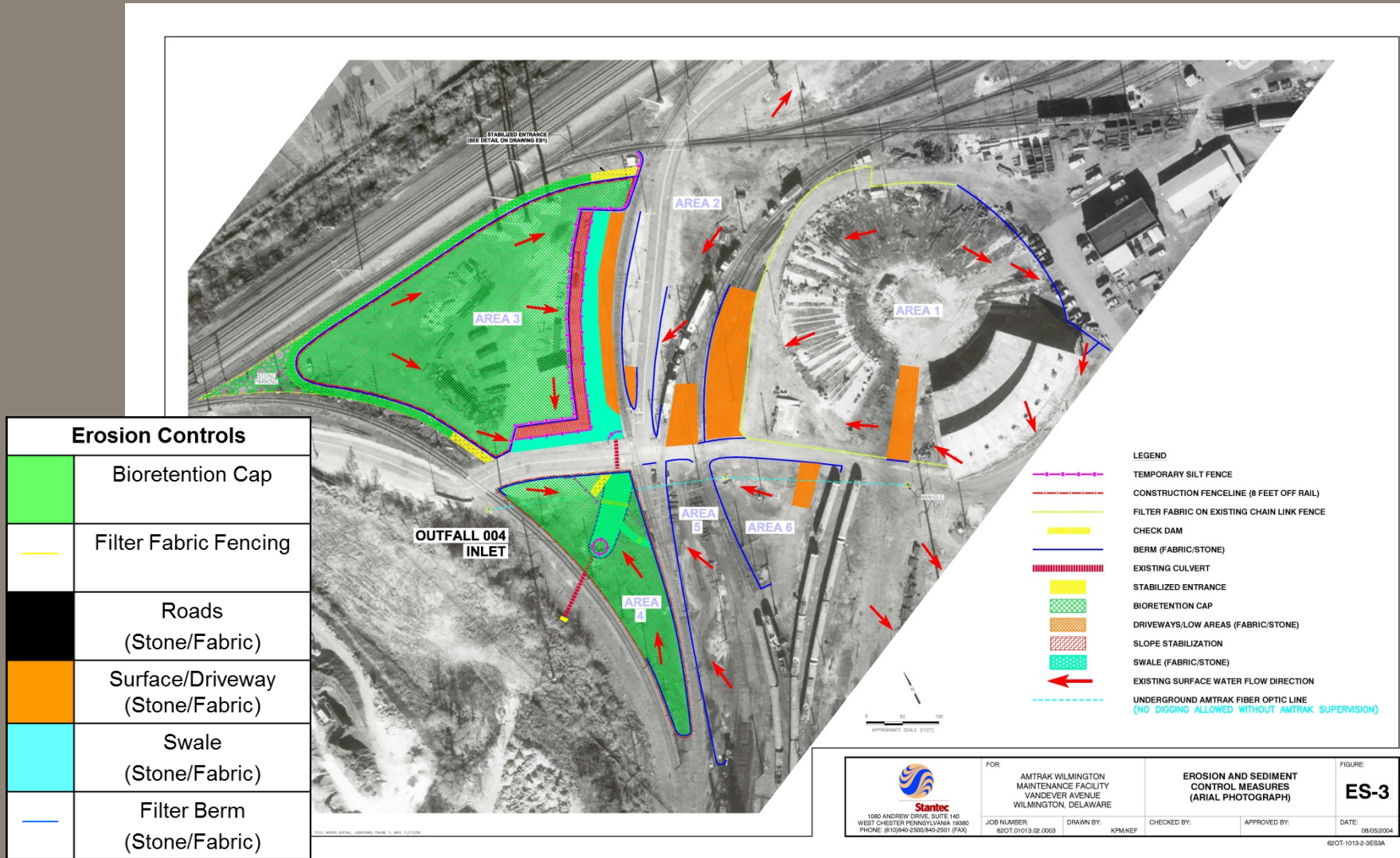
PCB Minimization Activities at Wilmington Shops – PMP Related and Ongoing

- Outfall 004 Area – erosion control measures (BMPs)
- Outfall 002 track down sampling and sewer cleaning
- Industrial Waste (IW) sewer track down sampling; steam bay cleanout
- Outfall 007 track down sampling
- Ongoing “inlet protection” pilot program
- Focused soil sampling and BMPs
- Activities integrated into the Delaware Voluntary Cleanup Program and EPA Region 3 TSCA Program
 - Oil recovery
 - Soil removal and capping
 - Sediment stabilization

Outfall 004 Catchment Area (approx. 11 acres)



Outfall 004 Drainage Area Erosion and Sedimentation Controls



Outfall 004

Before



After



Outfall 002 PCB Minimization Activities



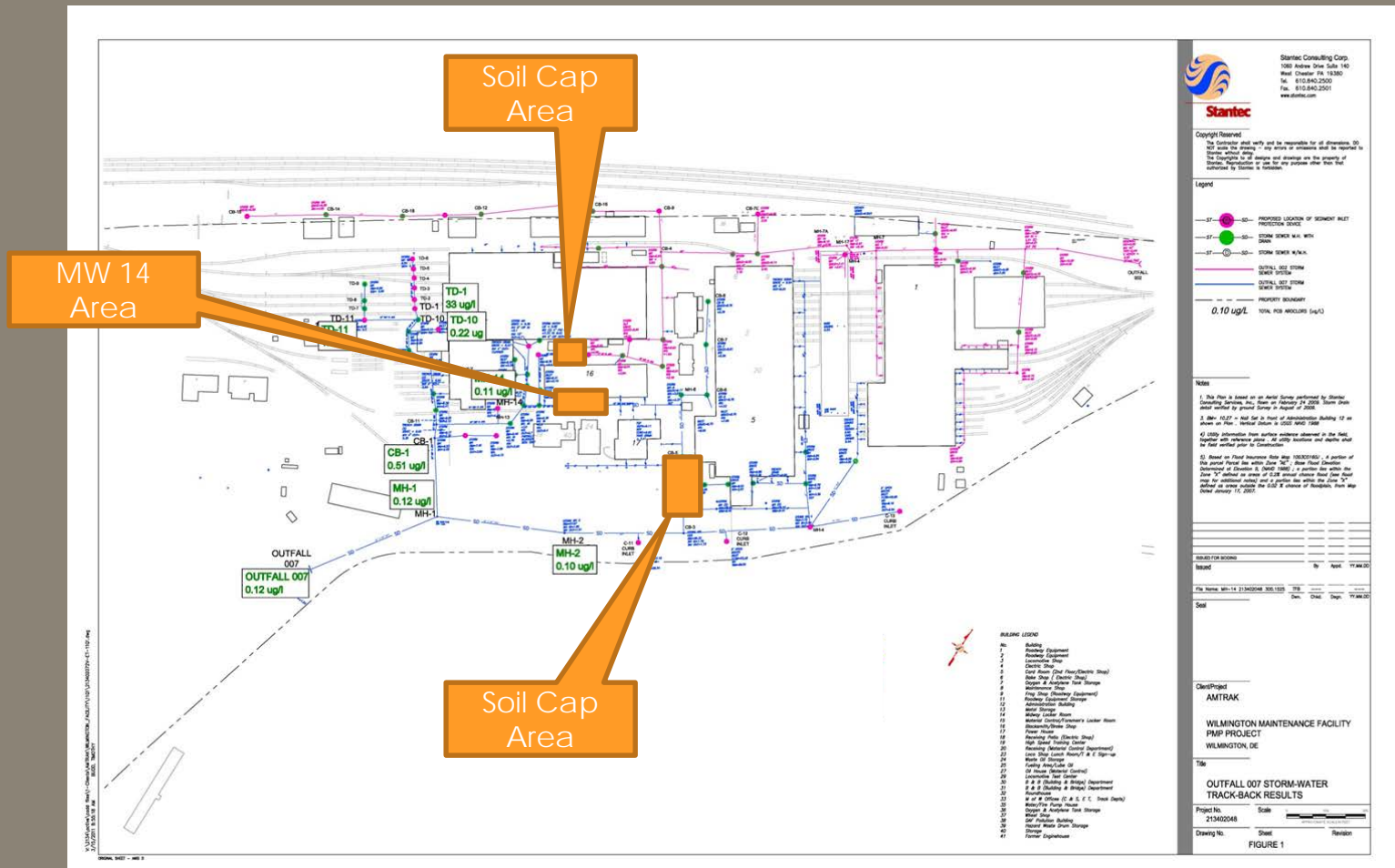
Outfall 002 Storm
Sewer Cleanout



Localized
E&S Controls

Outfall 007 Track Back Investigation

use of less expensive PCB analytical method for track-back purposes



Additional/Ongoing Minimization Measures



Inlet sediment traps

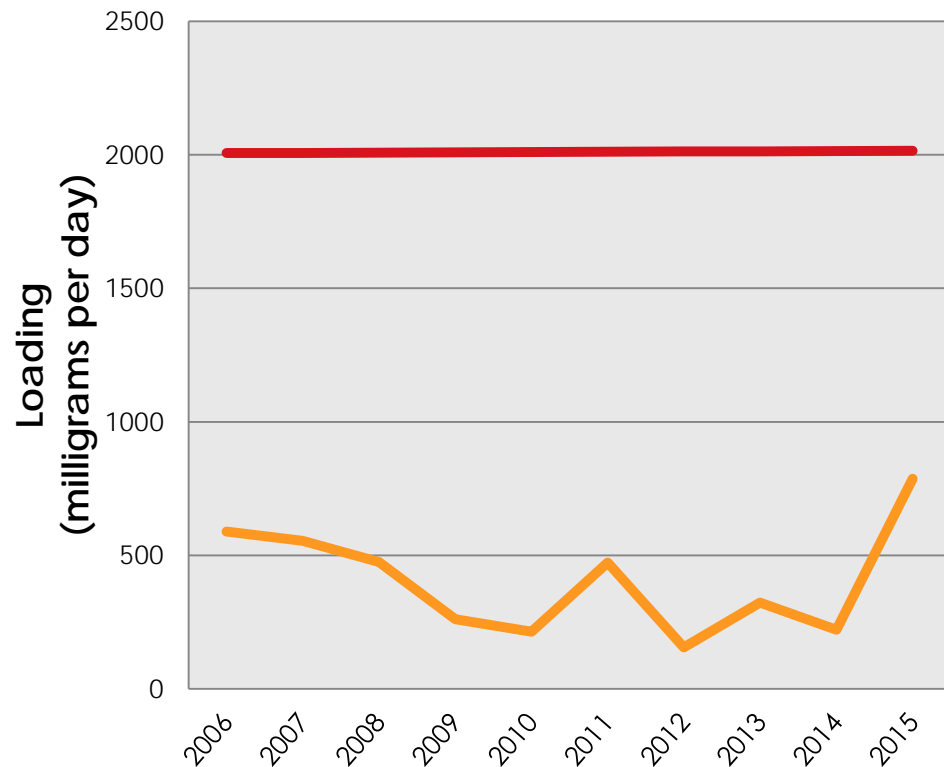


Additional BMPs

Wilmington Shops Results

- Outfall 004:
 - Approximately 94% reduction in PCB concentrations at Outfall 004
 - Program received the Business and Industry Award from the Water Resources Association of the Delaware River Basin
 - Positive response for regulatory agencies; benefits integrated into overall site remediation strategy
- Wilmington Overall PMP PCB loading reductions consider the following:
 - Outfall 002; 15 acre drainage area
 - Outfall 004; 11 acre drainage area
 - Outfall 007; 29 acre drainage area
 - IW Sewer to City POTW
- Baseline loading
 - Approximately 2,100 mg/day
- Estimate 4,322 pounds of PCBs removed through PMP activities

Annual Loading v. Baseline Load



Lessons Learned

- Partnering with other dischargers (“Coalition”) helped Amtrak conserve resources
- Significant PCB loading reductions can be achieved through PMP activities, anticipate variation
- PCB minimization measures can be incorporated into overall site remediation measures
- Use of alternative (less expensive) methods to Method 1668A for track back and source identification investigations
- Need to consider the results of very low PCB detection levels