Design and Build Workshop

February 12 and 13, 2018

Why Are We Here

High Quality H2O
Topics

- Morning Session
  - Pre Application Meetings
  - Permit Submission
  - Completeness Review
  - Construction Sequence
  - Rate Volume and Water Quality
- Afternoon Session
  - Co-Permittees
  - NPDES Permit Responsibilities
  - Self Monitoring Inspections
  - Tricks of the Trade and How BMPs Work
  - Release of Liability and NOT Updates
- Round Table Discussion - Conservation Districts, Engineers and Contractors Working Together for Economic Growth and Resource Protection.

Pre-Application Meetings

- Why?
  - Project Understanding
  - Legacy and historical issues
  - Discuss critical issues, timelines
  - Highly encouraged - reduce review times
  - Multiple meetings are recommended on large, complex projects
  - Joint meetings with DEP, 105 review staff, municipalities

Pre-Application Meetings

- Materials to Provide:
  - Survey
  - Wetland delineation (EV Wetlands)
  - Surface Water locations (Buffers, DS Analysis?)
  - Soils testing locations, results
  - Surface Water Designations
  - PNDI/ PHMC results
  - Site Layout/Grading
  - Act 167 Management Districts
EV Wetlands

- Definition (105.17)
  - Threatened or endangered Species habitat
  - Wetlands within 1/4 mile of T&E species and support habitat
  - Wetlands along the floodplain of naturally reproducing trout streams and their tributaries
  - Wetlands along an existing drinking Water Supply

Pre-Application Meetings

- Discussion
  - Discharge Points/Downstream Analysis
  - BMP Selection/Location
  - Volume Requirement
  - Water Quality Strategy
  - Non-Structural BMP’s
  - Buffer Requirements
  - E&S Strategy (socks vs traps/basins)
  - Other Permits, Approvals
  - Anticipated Submittal Date
  - Anticipated Construction Date

Pre-Application Meetings for Permit Amendments
Permit Submission

- Suggestions
  - Do not bind the NOI, GIF, Act 14's etc. into a bound report
  - Keep the NOI separate from other documents
  - Please do not double side and combine the NOI, Land Use, Checklist and Worksheets together.
  - Number the pages of your PCSM report, especially printouts and double sided copies
  - Do not provide extra copies "just in case"
  - Elaborate Bindings not required. Can do numbered pages and binder clips until the end.

Completeness Review

- Why a "detailed" review?
  - All items are provided
  - NOI is correct
  - Consistency between calculations
  - Minimize Significant Design changes and wasted reviews
  - Minimize review and permitting times
  - Reduced Permit Fees

Completeness Review

- Common Issues/Missing Items
  - GIF
    - Sewer 537 Plan Approval
    - Water will serve letter
  - EV Wetland Anti-Degradation Analysis
    - Report of no wetlands
  - Downstream Analysis for Non Surface Water Discharges
    - Buffer Equivalency, Offsetting information
  - Use of Non-Structural BMP's not identified or justified
  - Insufficient soil testing or Insufficient information (raw data not provided)
Completeness Review

- Common issues/Missing items
  - Inconsistent Rate, Volume, WQ calculations
    (further discussion later)
  - All PCSM BMP's design and details provided.
  - Incorrect NOI Completion
    - Section C, Item 5-Waters Where Project discharges not all inclusive
    - Section D, Item 2-PCSM Plan in accordance with Act 167-only 1 answer
    - Section D-Tables not consistent with calculations
    - Section D, Item 5-off site discharge analysis not answered correctly
    - Section D, Item 7-Buffer not addressed properly
    - Section E-Anti-Deg narrative not attached
    - Section G-Compliance History-CAR, CSOs, or Enforcement Action

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Completeness Review

Section C, Item 5-Waters Where Project discharges not all inclusive

1. Waters in which project discharges (Check all that apply)
   - Greenfield Creek
   - Other waters

2. Status of stream evaluations to which the project discharges or has (had potential for discharge to existing WW oversight) (check all that apply)
   - Project exists
   - Other waters

3. NOI Checklist
   - Site Plan
   - Stormwater Plan

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Completeness Review

Section D, Item 2-PCSM Plan in accordance with Act 167-Usually only 1 answer

1. PCSM Plan
   - The PCSM Plan must indicate if subchapter A or B applies.
   - Act 167 Plan approved on or after January 1, 2005 = the approved PCSM Plan in use today, in draft for projects under Act 167 "Old" or "New".
   - Check the following fields for all applicable approved but not "Existing WW Oversight" Plans, have additional check if necessary.

   - Act 167 Plan Status
     - Initial Approval
     - Resubmission
     - Final Approval
     - Effective Date
     - Final Approval Date

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2. Table 5-Additional Information
   - Additional information includes the stormwater management plan (SWMP) and the stormwater control measures (SCMs).
   - The SWMP is used to identify and control stormwater runoff from the project.
   - The SCMs are the specific measures implemented to control stormwater runoff.

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3. Table 6-Additional Information
   - The table provides additional information on the project.
   - It includes the project's name, location, and date of completion.
   - The table also includes information on the project's water quality goals, the project's water management practices, and the project's water quality monitoring plan.

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4. Table 7-Additional Information
   - The table includes additional information on the project's water quality and quantity goals.
   - It also includes information on the project's water management practices and the project's water quality monitoring plan.

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5. Table 8-Additional Information
   - The table provides additional information on the project's water quality and quantity goals.
   - It includes information on the project's water management practices and the project's water quality monitoring plan.

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6. Table 9-Additional Information
   - The table includes additional information on the project's water quality and quantity goals.
   - It also includes information on the project's water management practices and the project's water quality monitoring plan.
Completeness Review
Section E. Tables not consistent with calculations

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<th>Predicted</th>
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Completeness Review
Section D, Item 5 - off-site discharge analysis not answered correctly

5. Off-site Discharge Analysis
   - Has the project been developed on a wetland, stream, ditch, pond, or other surface water? [ ] Yes [ ] No
   - If yes, the applicant must provide appropriate measures that prevent the legal entry of the project discharge. In addition, you must provide a description of the impact of the project discharge on the stream, ditch, pond, or other surface water. [ ] Yes [ ] No
   - This has been the best technology to meet project, funding, and other requirements. The project discharge is a negligible contribution to the receiving waterbody. [ ] Yes [ ] No

Example: Project discharge does not enter a wetland, ditch, stream, pond, or other surface water. Project discharge is not visible or audible. Project discharge is not visible or audible. Project discharge is not visible or audible.

Completeness Review
Section D, Item 7 - Buffers not addressed properly

7. Buffer Easement
   - Has the project been developed on a wetland, stream, ditch, pond, or other surface water? [ ] Yes [ ] No
   - If yes, the applicant must provide appropriate measures that prevent the legal entry of the project discharge. In addition, you must provide a description of the impact of the project discharge on the stream, ditch, pond, or other surface water. [ ] Yes [ ] No
   - This has been the best technology to meet project, funding, and other requirements. The project discharge is a negligible contribution to the receiving waterbody. [ ] Yes [ ] No

Example: Project discharge does not enter a wetland, ditch, stream, pond, or other surface water. Project discharge is not visible or audible. Project discharge is not visible or audible. Project discharge is not visible or audible.
Complete Review
Section E-And-Upgradation narrative not attached

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<th>Project Description</th>
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Complete Review
Section G-Compliance History-CAP, COA or Enforcement Action

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Construction Sequence
102.4(b)(4).....“earth disturbance activities shall be planned and implemented to the extent practical in accordance with the following:”

(i) Minimize the extent and duration of earth disturbance
- Clear but do not grub areas until earthwork commences
- Install subbase on parking lots

(ii) Maximize Protection of Existing Drainage Features and Vegetation
- Minimize exposure of bare earth
- Fencing around streams, buffers and wetlands
- Intrastm work during low flow

(iii) Minimize Soil Compaction
- Protect Infiltration Areas
- Scarify and seed topsoil
- Erosion control measures, seeding, mulch

(iv) Utilize other measures or controls that prevent or minimize the generation of increased stormwater runoff
- Control and Manage the limits of disturbance
- Traps, basins to control sediment and runoff during construction
Construction Sequence

- Sequence should address what BMP's are needed to perform what items/areas of work.
- Tailor the sequence to allow concurrent activities to occur if feasible (mini sequences)
- You are not sequencing "means and methods" of construction. BMP installation sequence to minimize pollution potential and earth disturbance.
- Engage a site work contractor to review/ provide input on the sequence of construction

Construction Sequence

- Common issues
  - Compost Filter socks utilized in areas of mass cut and fill operations. Difficult to maintain sheet flow - need traps and basins
  - Building construction occurs in wrong portion of sequence.
  - Cut and fill operations are at separate points in the sequence.
  - Storm pipes installed in fill areas prior to fill placement
  - Work space requirements not considered (cranes, staging areas, contractor parking, etc.)

Construction Sequence

- The Basics
  - Clear but don't grub areas until those areas are needed. Stockpile topsoil near the cut/fill line.
  - Divert upstream clean runoff. Separate clean water from dirty water
  - All dirty runoff needs to pass through a BMP before leaving the site.
  - Stabilize areas as soon as possible with clean stone (parking) or vegetation.
  - Inspect and maintain the BMP's
Construction Sequence

- Step 1: Remove Buildings, Clear
  - Install Compost sock on downslope side
  - Fence off Infiltration Areas
  - Use existing paved roads for site access, Install Rock entrance if the roads break down, tracking.
  - Clear site but do not grub. Remove trees and buildings from site using existing road network.
  - Upon completion of this step, Steps 2 and 3 can be performed concurrently or separately.
Construction Sequence

- Step 2- Work in Area 1
  - Install Utilities from existing road to beyond the swale location at a minimum. Temporarily remove sock at utility location and reinstall at end of day. Perform daily restoration at sock location.
  - Grub for trap, swale and building area. Stockpile topsoil at location noted.
  - Install Trap. Use material from trap and place as fill at the building. Install collection swale to basin.
  - Clear Area 1. Perform cut and fills for site. Install storm system, underground infiltration systems and cap as fills placed.
  - Install subbase as parking is brought to grade. Install topsoil seed and mulch on vegetated areas. Install slope blankets
  - Convert trap once upstream areas are stabilized.

Construction Sequence

- Step 3- Work in Area 2
  - Install access road and install storm system bypass.
  - Grub for basin and swale. Stockpile topsoil at location noted.
  - Install trap. Use material from trap and place as fill for parking lot. Install collection swale to trap.
  - Clear Area 2. Perform cut and fills in Area 2. Install storm system, underground infiltration systems and cap.
  - Install subbase as parking is brought to grade. Install topsoil seed and mulch on vegetated areas. Install slope blankets
  - Convert trap following Step 4 once upstream area is stabilized

Construction Sequence

- Step 4- Trap Conversions and wrap up
  - Contact CD for inspection prior swale and trap conversion.
  - Remove collection swales starting at upstream end and stabilize. Convert trap to permanent detention basins.
  - Complete earthwork operations and install subbase and vegetation.
  - Install curbs and pave.
  - Remove remaining BMP’s once site is stabilized.
Construction Sequence

- Soil Testing at Basins
  - If area is disturbed
  - If additional tests need to verify performance
  - If area will receive runoff during construction
  - If soil amendments being placed
- Contact C of D provide summary of results, follow up with report
- Subsurface basins
  - Install pipe system
  - Work off loose dumped gravel
- Use Curb, wall to help control, convey water
- Create sumps around inlets to capture sediment

Rate, Volume and WQ

- Provide Simplified mapping of drainage areas.
  - Keep labels to a minimum
  - Layout features in the background
  - Use multiple, smaller site maps for volume, water quality
  - Separate mapping for tracts, pipe sizing from rate, volume
- Add Labels, notes to computer printouts, worksheets if it helps to follow your work
- Summary Tables vs Printouts of all Hydrographs
  - Need to Provide 2 year and 100 year printouts of all hydrographs
  - 10,25,50 may be optional but need summary tables
- Organize Report by Rate, Volume, Water Quality
- Keep the Worksheets together, preferably bound in the PC or report. Additional set not needed if in the report.

Rate Control

- Rate Control
  - Pre and Post Development Mapping
    - Keep Pre and Post as separate maps
    - Consistent labelling, naming of basins
    - Note if subwaters were eliminated along the way (non-sequential)
  - Proper Management District
    - Identify in narrative
    - Identify release rates
    - Show/ explain how allowable rates were determined
    - Downstream Analysis for direct discharge districts
  - Linear Projects (PennDOT, Power lines, Utility lines)
    - Check for localized flow increases at cross pipes/discharge points, bypass areas (downstream analysis)
    - Power, gas lines-like discharges to non surface waters
## Rate Control

### Rate Analysis
- In post-development condition less than or equal to pre-development condition.
- Total Drainage Areas matches between Predevelopment and Post Development.
- Change in impervious surfaces identified/ able to be determined.
- Infiltration properly modeled in program.
- Diversion explain how values were determined.
- Show conversion from in/hr to cfs.
- Numbers match NCI values in peak rate analysis.

## Rate Control

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<th>Total Drainage Areas matches between Predevelopment and Post Development.</th>
<th>Watershed</th>
<th>Area</th>
<th>Rate Demand</th>
<th>Total Area In.</th>
<th>Predevelopment</th>
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<td>Pre</td>
<td>157,007</td>
<td>2.84</td>
<td>160,958</td>
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<td>Post</td>
<td>147,782</td>
<td>18.6</td>
<td>153,010</td>
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<tr>
<td>Total Predevelopment</td>
<td>304,789</td>
<td>21.4</td>
<td>313,968</td>
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</tr>
</tbody>
</table>

### Post Development

| Block | 94,398 | 1.98 | 96,394 |
| Rate for PDI 1 | 99,395 | 0.55 | 99,395 |

| Step 1 | 274,262 | 5.16 | 276,542 |
| Step 2 | 32,514 | 0.75 | 32,514 |
| Step 3 | 55,755 | 1.14 | 55,755 |
| Step 4 | 55,755 | 1.14 | 55,755 |
| Step 5 | 55,755 | 1.14 | 55,755 |
| Step 6 | 55,755 | 1.14 | 55,755 |
| Step 7 | 55,755 | 1.14 | 55,755 |
| Total PDI 1 | 89,395 | 1.70 | 89,395 |
| Rate for PDI 2 | 89,395 | 0.48 | 89,395 |

### Total Runoff

| Runoff | 325,900 | 21.4 | 333,955 |
| Difference | -19,000 | 0.47 | 19,000 |

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<td>295,564</td>
<td>37.2</td>
<td>306,020</td>
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### Post Development

| Block | 56,254 | 1.01 | 56,254 |
| Rate for PDI 1 | 55,253 | 0.77 | 55,253 |

| Step 1 | 224,506 | 4.14 | 224,506 |
| Step 2 | 34,684 | 0.70 | 34,684 |
| Step 3 | 51,753 | 0.80 | 51,753 |
| Step 4 | 51,753 | 0.80 | 51,753 |
| Step 5 | 51,753 | 0.80 | 51,753 |
| Step 6 | 51,753 | 0.80 | 51,753 |
| Step 7 | 51,753 | 0.80 | 51,753 |
| Total PDI 1 | 103,753 | 1.95 | 103,753 |
| Rate for PDI 2 | 103,753 | 0.58 | 103,753 |

### Total Runoff

| Runoff | 295,564 | 21.4 | 306,020 |
| Difference | -19,000 | 0.47 | 19,000 |
Rate Control

- Basins
  - Stage/Storage Elevation Data Provided
  - Storage data provided exceeds the routed 100 year WSEL
  - Design Flows for Emergency Spillway
    - Routed 100 year flow
    - Clogged primary outlet structure
  - Rock Aprons designed for 100 year outflow from primary structure
  - Spillway lining extends beyond toe of slope
  - Outlet Structure Configuration matches the details
  - Proposed flows to the basin can get to the basin

Volume Control

- 20% rule for impervious surface- identify and follow what is being converted to meadow
- Difference in impervious surface matches rate control analysis on a drainage point and overall level for the project.
- Provide mapping or use rate control areas and identify Disturbed Areas
- Identify Road Maintenance Activities (Mill and Overlay is not Earth Disturbance)
- Volume Permanently Removed properly calculated (Inflow vs. storage/infiltration time)
- Proper Infiltration Time applied
- Non-Structural Volume BMP credits properly applied. Non Structural BMP’s meet the key design elements and criteria and credits.
- Infiltration Rates take into account proper safety factors
- Loading ratio and dewatering times provided

Worksheets

- One complete set (1-15 as applicable) for each discharge point from the project
- Worksheet 1
  - Total Project Areas from all WS's 1 should equal NOI Project Area
- Worksheet 2
  - Protected Areas identified on the PCSM Plan and the BMP manual Chapter 8 criteria and credits included
  - Notes on Protection Agreement Required
- Worksheet 3
  - Identified on the plans
  - Criteria and Credits included on the plans
  - Credit claimed matches design criteria
Worksheet 3

- Protect Existing Trees
  - Within Project Area
  - Native Trees 4" caliper or larger—Provide evidence
  - Undisturbed within 100' of impervious surface
  - Identify on plans, add criteria and credits
- Disconnect Roof Leaders
  - Vegetated Area 5% slope or less
  - Minimum Vegetative Length=75'
  - 500 SF roof EPA per disconnection point
- Disconnect Impervious Surfaces
  - Vegetated Area 5% slope or less
  - Minimum Vegetative Length=75'
  - 1000 SF impervious per disconnection point

Volume Control

- 20% rule for impervious surface—identify and follow what is being converted to meadow
- Difference in impervious surface matches rate control analysis on a drainage point and overall level for the project

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<th>Area (sq m)</th>
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<th>C</th>
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Volume Control

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<th>Area (sq m)</th>
<th>CW</th>
<th>S</th>
<th>C</th>
<th>p</th>
<th>R (R/P)</th>
<th>A</th>
<th>V (sq ft)</th>
<th>V (sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSA</td>
<td>0</td>
<td>19,761</td>
<td>1,900</td>
<td>24</td>
<td>1.52</td>
<td>1.04</td>
<td>1.03</td>
<td>215.6</td>
<td>104.7</td>
<td>280.7</td>
<td>280.7</td>
</tr>
<tr>
<td>SMA</td>
<td>0</td>
<td>19,613</td>
<td>1,875</td>
<td>24</td>
<td>1.52</td>
<td>1.04</td>
<td>1.03</td>
<td>215.6</td>
<td>104.7</td>
<td>280.7</td>
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<td>19,761</td>
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<td>1.03</td>
<td>215.6</td>
<td>104.7</td>
<td>280.7</td>
<td>280.7</td>
</tr>
</tbody>
</table>
Volume Control

- Volume Permanently Removed properly calculated (inflow vs. storage/infiltration time)

<table>
<thead>
<tr>
<th>POI-2</th>
<th>2 yr WDR</th>
<th>SRM with</th>
<th>WSS</th>
<th>Storage</th>
<th>Surplus over</th>
<th>Inf ratio</th>
<th>Volume Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basin A</td>
<td>895.41</td>
<td>897.75</td>
<td>100.00</td>
<td>896.75</td>
<td>120.75</td>
<td>0.1</td>
<td>995.41</td>
</tr>
<tr>
<td>Basin B</td>
<td>925.75</td>
<td>926.75</td>
<td>100.00</td>
<td>924.75</td>
<td>120.75</td>
<td>0.1</td>
<td>925.75</td>
</tr>
<tr>
<td>Basin C</td>
<td>935.75</td>
<td>936.75</td>
<td>100.00</td>
<td>934.75</td>
<td>120.75</td>
<td>0.1</td>
<td>935.75</td>
</tr>
<tr>
<td>Basin D</td>
<td>945.75</td>
<td>946.75</td>
<td>100.00</td>
<td>944.75</td>
<td>120.75</td>
<td>0.1</td>
<td>945.75</td>
</tr>
<tr>
<td>Basin E</td>
<td>955.75</td>
<td>956.75</td>
<td>100.00</td>
<td>954.75</td>
<td>120.75</td>
<td>0.1</td>
<td>955.75</td>
</tr>
<tr>
<td>Total</td>
<td>35949</td>
<td>35950</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Volume Control

- Proper infiltration Time applied
  - Volume Removed= "Dead Storage" below the first orifice + [(Inf. Time) / (Surf Area) * (Inf. Rate)]
  - Compare this volume to inflow volume to system.
  - Use Lesser Value

- Infiltration Times:
  - Previous Pave with Inf. Bed= Time bed is receiving runoff
  - Inf. Basin= Greater of 2 hours or Tc
  - Subsurface Bed= Greater of 2 hours or Tc
  - Infiltration Trench= Time bed is receiving runoff
  - Rain Garden= Time bed is receiving runoff
  - Follow the BMP Manual to determine volume removed

Water Quality

- Provide Mapping of treated areas
- Provide Manufacturer’s Data justifying removal %
- Only Disturbed Areas should be utilized for Worksheets 12 and 13. Purpose is to determine and remove pollutants from the project’s disturbed areas
Water Quality

- Worksheet 10
  - Show 90% of disturbed Area is treated by a BMP, meets CG-1
  - Checked BMPs meet the key design elements and criteria and credits

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#7</td>
<td></td>
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<tr>
<td>#8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Worksheet 10

- Cluster Uses at Each Site
  - Moving uses closer together (vertical development)
  - Maximizing clustering as much as possible legally

- Minimize Total Disturbed Area
  - Avoid Sensitive and Special Value Areas
  - Minimize Overall Project Disturbance
  - Minimize at the overall lot level

Water Quality-Worksheet 10

- Riparian Buffer Restoration
  - Protection, Maintenance and enhancement of existing buffers-Secondary
  - Buffer Restoration-Primary

- Landscape Restoration
  - Maximize native species and minimize lawn areas-Primary
  - Use of native species in select areas-Secondary

- Natural Drainage Features
  - Use and improve in order to eliminate pipe networks
  - Native vegetative buffers
Water Quality-Worksheet 12

- Based on Post Development Disturbed Areas
- Total Area on Worksheet 12's matches NOI Disturbed Acres
- Total Impervious Area matches Volume Control calculations for post condition (WS 4)

Water Quality-Worksheet 12

TOTAL DISTURBED AREA:

<table>
<thead>
<tr>
<th>LAND COVER CLASSIFICATION</th>
<th>PERCENTAGE</th>
<th>AREA (Acre)</th>
<th>TOXICITY</th>
<th>POISONOUS</th>
<th>ENSUING RECEIVED</th>
<th>TOTAL RECEIVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitats</td>
<td>27.5%</td>
<td>17.8</td>
<td>0.70</td>
<td>58.4%</td>
<td>17.8</td>
<td>58.4</td>
</tr>
<tr>
<td>Scrub Forest</td>
<td>52.0%</td>
<td>17.8</td>
<td>0.70</td>
<td>28.6%</td>
<td>17.8</td>
<td>28.6</td>
</tr>
<tr>
<td>Pasture</td>
<td>4.5%</td>
<td>17.8</td>
<td>0.70</td>
<td>4.5%</td>
<td>17.8</td>
<td>4.5</td>
</tr>
<tr>
<td>Crop</td>
<td>6.0%</td>
<td>17.8</td>
<td>0.70</td>
<td>6.0%</td>
<td>17.8</td>
<td>6.0</td>
</tr>
<tr>
<td>Impervious</td>
<td>5.0%</td>
<td>17.8</td>
<td>0.70</td>
<td>5.0%</td>
<td>17.8</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Water Quality-Worksheet 13

- Total Areas Treated equal or less than the area on WS 12
- Same Land covers used on WS 12 and 13
- Add residual loadings from upstream BMP's at the bottom of table, not embedded in table
- If using BMP's in series, show how pollutant reduction % were calculated
### Water Quality Worksheet 13

**Part 1**

<table>
<thead>
<tr>
<th>Land Cover Classification</th>
<th>Pollutant</th>
<th>Load (g/ha)</th>
<th>MWR (g/m²)</th>
<th>YLD (g/m²)</th>
<th>BDL (g/m²)</th>
<th>Pollutant Load (g/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Traffic Parking Lot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Traffic Parking Lot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part 2**

Add residual loadings from upstream BMP's at the bottom of the chart, not embedded in table.

**Example Street Sweeping**

**Pollutant Loadings Adjusted by Low Flow Levels**

**Part 3**

Add residual loadings from upstream BMP's at the bottom of the chart, not embedded in table.

**Adding Street Sweeping Residual Pollutants to Infiltration Basin**

**Pollutant Loadings Adjusted by Low Flow Levels**

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2/8/2018
Transition from Design to Build

Pre-Construction
- Co-Permittees need to be added to the permit
  Who, Why, When, How
- Pre-Construction Meeting needs to be held
  Who, Why, When, How

What to do Before Earth Disturbance

Co-Permittee
  Who, Why, When, How
Pre-Construction Meeting
  Who, Why, When, How
Co-Permittee Agreements

- **Who**: Operators - An operator is a person who meets either of the following criteria: 1) you have operational control of construction project plans and specifications, including the ability to make modifications to those plans and specifications; OR 2) you have day-to-day operational control (supervision) of those activities at the project that are necessary to ensure compliance with the Erosion and Sediment Control Plan for the site or ensure compliance with other permit conditions.
- **Why**: Clearly identifies the responsibilities of the parties involved and adds operators to the permit and makes them responsible. Required under Federal NPDES Regulations at 40 C.F.R. §122.21(b).
- **When**: Before Pre-Construction Meeting - Send a draft for review prior to signing the documents.
- **How**: TRANSFERED CO-PERMITTEE APPLICATION FOR A GENERAL OR INDIVIDUAL NPDES PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES DEP Form 3150-PM-BWEV0028 Rev. 9/2016

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Co-Permittee Agreement Tips

- Use the current form – Download the from DEP’s Website when you need it.
- The dates on Page 1 and 5 should match.
- Section E should include all DEP permits needed for the subject project.
- Copy Information from your permit - Most of the info needed to complete the form is on your permit.
- Section F is for the co-permittee applying to get onto the permit.
- Watch copy and past when using forms from previous projects – CCD name on page 5.
- Signatures of the permittee and new co-permittee are needed on need on page 5.
- If the total scope of the NPDES covered work is not covered by your contract, provide a detailed breakdown of your responsibilities in the application.
- DEP / NCCD needs original signatures.

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Co-Permittee and Permittee Responsibilities

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2/8/2018
Co-Permittee and Permittee Responsibilities

- Responsibilities covered in Co-Permittee Agreement, permit, plans, and permit documents
- Part A – Self Monitoring, Critical Stages
- Part B – Co-Permittee, BMP O&M, Duty to Comply
- Part C - Anti Degradation requirements, E&S Plans, PCSM Plans, Pre Con, NOT and Plan Recodation
- Appendix A Special Conditions

Pre-Construction Meeting

- Who: Permittee, Design Engineer, Co-Permittee, Township, CCD. Best to have the site super for the site at the meeting.
- Why: Exchange of information – Contact info, discuss any potential changes to the plans / sequence.
- When: Prior to Earth Disturbance or E&S measures.
- How: Call our office or e-mail Lori Kerrigan 570-629-3060, lkerrigan@ptd.net

Ready to Start Construction
Construction

- Construction Sequence and how to change it when you can’t or don’t want to follow it.
- Weekly Self Monitoring Inspections
- Tips and Tricks of the Trade and how BMPs work

Construction Sequence

- Generally written without input from the contractor responsible to stick to it.
- No one way to do a project, may not be the cheapest way to do the project.
- Contact CCD inspectors if you want to change it – talk about it at Pre-Con.

Self Monitoring

- Who: The Permittee(s) and Co-Permittee(s) are responsible for compliance and are responsible to complete the self monitoring inspections and keep a log of the inspections.
- When: Should be completed weekly and after every measurable rainfall or runoff event.
- What: All E&S and PCSM BMPs should be inspected to verify they are installed and functioning.
Self Monitoring Form

How E&S and PCSM BMPs Work

• E&S BMP Types
  – Perimeter
  – Conveyance
  – Basins
  – Pump and treat
• PCSM BMP Types
  – Structural and Non Structural
    • Rate Reduction
    • Volume Reduction
    • Water Quality

E&S BMPs
Perimeter BMPs

- Silt Sock
  - Trap and settle
  - Flow Through

Perimeter BMPs

- Silt Fence
  - Trap and Settle
  - Some Flow Through

Perimeter BMPs

- Inlet Protection
  - Traps sediment before it is introduced to the storm system.
Perimeter BMPs

- Rock Construction Entrance
  - Transition between disturbed and undisturbed areas
  - Removes sediment from tires to prevent tracking

Conveyance

- Diversion Berm / Swale
  - Clean water – used to bypass undisturbed upslope runoff around the site.
  - Dirty water – used to convey sediment laden water to sediment removal facilities (Basins / Traps, etc.)

Clean Water
Dirty Water

Basins
- Sediment Traps
  - Smaller drainage areas < 5 acres
  - Different types
    - Embankment
    - Riser
    - Dry
- Sediment Basins
  - Larger drainage areas > 5 acres
  - Skimmer dewatering
  - Riser dewatering
- Water Bars with Sumps

Sediment Trap
- Embankment Trap
Sediment Traps

• Riser / Barrel Trap

Sediment Trap

• Dry Sediment Trap

Sediment Basins

• Skimmer
Sediment Basins

- Riser / Barrel Basin with Baffles

Water Bars with Sumps

Pump and Treat

- Pumped Water Filter Bag (most common)
Pump and Treat
- Pumping to a sediment trap / basin

PCSM BMPs

PCSM BMPs
- Non-Structural
- Structural
- Treat 3 things Rate (Q), Volume (V), and Water Quality (WQ)
Protecting sensitive / special resources

- Treats Q,V,WQ
  - Wetlands
  - Steep Slopes
  - Woods
  - Riparian Buffers
  - Meadow

Minimize Grading / Earth Disturbance

- Treats Q,V, &WQ

Disconnection

- 2 types - Roof Top and Impervious
  Treats Q,V & WQ
Street Sweeping

- Treats WQ Only

Structural BMPs

- Basins, above ground, below ground, detention, infiltration, water quality, combination.
- Raingardens
- Pervious Pave
- Vegetated Swales
- Vegetated Roofs
- Amended Soils
- Capture and Re-Use
- Inlet Filters

Basins

- Detention
- Treats Q, WQ
Basins

- Infiltration
- Treats V, WQ

Basins

- Combination
- Treats Q,V, WQ

Rain Gardens

- Treats Q,V, WQ depending on its design
Pervious Pave

Vegetative Swale
- Treats Q, V, & WQ.

Vegetative Roofs (Green Roofs)
- Treats Q, V, & WQ.
Inlet Filters

- Treats WQ

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Tricks of the Trade

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Knowing your Plans

- Staying in sequence and meeting project timelines and goals. Building Pad First?
Perimeter Control BMPs
- Maintaining sheet flow to perimeter BMPs
- Trenching in Silt fence and blowing compost wedge for silt sock.
- Field Tweaks to perimeter BMPs – on contour, extend/reposition as needed to meet field conditions.

BMP Practicality
- Don’t use sheet flow BMPs for concentrated flow treatment.
- Inlet Bags on inlets going to traps/basins – probably not needed*
- Stockpiles on cut and fill boundary
- Compost socks upslope of cut/disturbed area – probably not needed

*UG facilities should ALWAYS be protected from sedimentation

Issues During Construction
- Unintended conveyances such as roads or berms.
- Existing features are not quite as they appear on paper
Basins/ Traps

- Use conveyance structures during construction
- Stabilize conveyances to the basin bottom

Button it Up!

- Topsoil, seed, mulch, amendments
- Soil Infilling
  - Used with permanent E&S matting to aid in vegetative establishment (see next slide)

Soil Infilling

- 2 Growing Seasons- No Infill
- Next Growing Season- w/ Infill
Stable Ground
• Driveway & parking lot Sub Base asap for stabilization
  – Move the RCE to edge of disturbance.

Infiltration Facilities
• Avoid compaction and sedimentation
• Document Critical stages
  – Take lots of pictures — helps prevent and diagnose problems with infiltration later on.

In It For The Long Haul
• Use Plywood Baffles if the Sediment Basin will be used for multiple seasons.
Questions?

Post Construction

Release of Liability / Notice of Termination Updates
- New Forms – Download from the DEP site.
- Revised NOT Checklist.
- New As-built Record Plan Checklist.
- PCSM Instrument Filing Notice no longer needed or available.
- Document Revision History.
- ROL will be denied if there are any violations on the site discovered during the ROL inspection.
What to Include with the NOT

As-Built Surveys and Record Plans

- Why: An accurate plan of the as-built condition of the BMPs is needed for the owners operation and maintenance of the facilities. It is required as part of the termination of the NPDES permit under 102.8(f)
- Who: It is the Permittee's responsibility to provide the as-built record plans at permit termination. This should be included as an item in bids so they are not overlooked later on or a surprise expense at the end of the project.
- What: Amended PCSM Plan

As-Built Record Plan Example
As-Built Surveys and Record Plans
- What needs to be included: NOT Record Drawing Checklist

As-Built Surveys and Record Plans
- Survey During Construction: Survey is needed during construction of any BMP that will not be accessible once the construction has ended. This includes certain water quality filters, underground detention/infiltration basins, etc.
- Format: The most useful format is when the approved PCSM Plan and Details are used as the base map with the original dimensions, elevations, grades, etc., stuck with the as-built information provided next to the original info.
- It is best to send the as-built record plans to the CCD (e-mail to MCCD is preferred) prior to recodat to verify that they are adequate.
- Discrepancies: Where there are significant differences between the design and as-built dimensions, elevations, volumes, etc. of the BMP, additional calculations, testing, alterations, etc. may be required to verify that the construction changes maintain compliance with the NPODES requirements and the original design.

Questions?