Plan

Review

Examples

4a, 4b & 4c

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NJDEP Division of Water Quality
SWMDR Training Module 4
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EXAMPLE 4a
Project Information

- Development $\geq 1$ acre disturbance
- Major development
  - Water quantity is required
- Increase of impervious surface $\geq 0.25$
  - Water quality is required
- Groundwater recharge is required unless exempt
  - PA1 area, but whether a part of the property is “previously developed” is questionable
Recharge Exemption

• Groundwater recharge requirement does not apply to projects within the “urban redevelopment area.”

• "Urban Redevelopment Area" is defined as previously developed portions of areas:

  1. Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
  2. Designated as CAFRA Centers, Cores or Nodes;
  3. Designated as Urban Enterprise Zones; and
Previously Developed Area?
Groundwater Recharge Exempt?
<table>
<thead>
<tr>
<th>BOOK</th>
<th>PAGE</th>
<th>DEED DATE</th>
<th>DATE RECORDED</th>
<th>R.T. FEE</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5560</td>
<td>4814</td>
<td>06/05/12</td>
<td>06/14/12</td>
<td>500</td>
<td>125000</td>
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**TAX MAP & LIST DESCRIPTIONS**

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>LOT</th>
<th>QUAL</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>48</td>
<td>CONDO</td>
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**PROPERTY CLASSIFICATION**

<table>
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<tr>
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<th>QUAL</th>
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<tbody>
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</table>

**ASSESSED VALUE**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>LAND</th>
<th>BUILDINGS</th>
<th>TOTAL</th>
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<tr>
<td>2012</td>
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**PROPERTY LOCATION**

<table>
<thead>
<tr>
<th>FLOOR AREA</th>
<th>YEAR BUILT</th>
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**REMARKS:**

**ADDITIONAL BLOCKS/LOTS**

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>LOT</th>
<th>QUAL</th>
<th>LAND</th>
<th>BUILDINGS</th>
<th>TOTAL</th>
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</thead>
<tbody>
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**NONUSABLE CODE**

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<th>SERIAL NO.</th>
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<tr>
<td>3329747</td>
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EXAMPLE 4b
Project Information

- Development ≥ 1 acre disturbance
- Major development
  - Water quantity is required
- Increase of impervious surface ≥ 0.25
  - Water quality is required
- Groundwater recharge is required unless exempt
  - PA1 area, but whether a part of the property is “previously developed” is questionable
Extended standard constructed wetland
Other Issues

Minimum Length to Width Ratio 1:1
One inlet is too close to the outlet
Other Issues

- Nonstructural strategies were incorporated
- Water Quantity Calculation was underestimated

**Table: PDS-based precipitation frequency estimates with 90% confidence interval**

<table>
<thead>
<tr>
<th>Duration</th>
<th>1 year</th>
<th>2 year</th>
<th>5 year</th>
<th>10 year</th>
<th>25 year</th>
<th>50 year</th>
<th>100 year</th>
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<tbody>
<tr>
<td>1-24 hr</td>
<td>2.81</td>
<td>3.40</td>
<td>4.37</td>
<td>5.19</td>
<td>6.44</td>
<td>7.52</td>
<td>8.72</td>
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<tr>
<td></td>
<td>(2.60-3.06)</td>
<td>(3.15-3.70)</td>
<td>(4.04-4.75)</td>
<td>(4.79-5.64)</td>
<td>(5.88-6.98)</td>
<td>(6.82-8.14)</td>
<td>(7.83-9.45)</td>
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<tr>
<td>County</td>
<td>Union</td>
<td>1 year</td>
<td>2 year</td>
<td>5 year</td>
<td>10 year</td>
<td>25 year</td>
<td>50 year</td>
</tr>
<tr>
<td></td>
<td>2.80</td>
<td>3.39</td>
<td>4.35</td>
<td>5.17</td>
<td>6.42</td>
<td>7.49</td>
<td>8.69</td>
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</table>
Maintenance Plan

- No responsible party contact information
- No specific preventative tasks for constructed wetland
  - Wetland Vegetation
  - Depth/Settlement
  - Sinuous path pattern
  - Channelization
- No cost estimate
  - Regular maintenance
  - Dredge
  - Permit
EXAMPLE 4c
Infiltration basin
Soil Testing

Infiltration Basin
• Bottom from EL. 89 to EL. 88 &
• Sand bed 0.5 ft
• Lowest point = EL. 87.5
• Basin area = 6,540 sf
• Max. water quality storm depth EL. 89.1
• Soil Test Pits, TP#1 & TP #2

• No. of soil test pits
  o 6,540 sf
• Location
  o In the infiltration area
Soil Testing

- Soil profit pit depth from basin’s sand bottom
  - Greater of 8 ft or 2x max water depth (1.1 ft)
- Sand bottom is at EL. 87.5 ft
- Required depth = 8 ft below EL. 87.5 ft

**TP#1 Depth**
- GL is EL. 93.8 ft,
- The required depth
  $$= 93.8 - 87.5 + 8 = 14.3 \text{ ft (176 in from GL)}$$

**SHWT separation**
- SHWT at 96 in from GL;
- Sand bottom at EL. 87.5 ft (75.9 in from GL)
- Separation = 20.1 in (1.68 ft)
- Separation is not enough

[Image of the soil testing report]

**Note:**
- SHWT: 96 in, Seepage at 134 in
- No permeability test taken
**Permeability Test**

TP#2 Depth

- GL is EL. 91.8,
- Required depth
  = $91.8 - 87.5 + 8 \text{ ft}$
  = 12.3 ft (147.6 in) from GL

SHWT separation

- SHWT at 56 in (EL. 87.13 ft)
- sand bottom at EL. 88.5 ft
  (39.6" from GL)
- separation $= 88.5 - 87.13 = 1.37 \text{ ft}$
- Permeability rate test depth
- below sand bottom of the basin but above SHWT
  - Most restrictive horizon is Sandy Loam
  - Tested at sandy soil layer
Consequences
Other Issues

- Infiltration basin has a slopped bottom
  - Infiltration basin needs to have a level basin bottom in order to even distribute runoff over entire basin bottom for even infiltration

- K4 sand was used for the sand layer of infiltration basin
  - Sand layer must meet the specification of K5 sand
STORMWATER MANAGEMENT FACILITIES MAINTENANCE,
REPAIR AND SAFETY PLAN

The on-site stormwater management facilities were designed to operate under conditions that require regular active maintenance to ensure their integrity and proper operation. In order to assure the aforementioned, the following maintenance plan must be implemented and adhered to by the owner as a minimum. Should specific conditions warrant additional maintenance measures shall also be implemented as required. When establishing or restoring vegetation, bi-weekly inspections of vegetation health should be performed during the first growing season. Once established, the inspection of vegetation health, density and diversity shall be performed at least twice annually. The vegetated cover should be maintained at 85%.

1. Inspection

Routine inspection of the Infiltration/retention basin shall be performed on a monthly basis and following all storms exceeding one inch of rainfall. In addition to the monthly inspections, the basin should be inspected annually by a licensed professional engineer to ensure its proper operation and to provide recommended changes to the maintenance thereof. Among the specific items that must be looked for and reported on are erosion of the side slopes, breaching of embankments, damage to fences and gates, and deterioration of the headwalls and outlet works. Any erosion on the basin side slopes must be repaired and then reseeded in accordance with the State Soil Erosion Control Standards. Breaching of embankments may be caused by animals, settlement or other factors. Deterioration of the outlet structure may cause a basin failure to occur and result in property damage downstream. Due to all of the concerns above, any observed deficiencies must be reported and corrected immediately upon discovery. Other minor items such as displacement of rip-rap, etc., should also be noted and repaired in a timely fashion.

2. Maintenance Activities

A. Turf Management

All turf shall be actively maintained throughout the year by the proper application of fertilizers, pesticides, weed control, lime, supplemental seeding, and any other measures necessary to maintain a healthy stand of grass. All treatments are to be applied in accordance with the manufacturer’s recommendations and safety precautions. Grasped areas are to be mowed twice a month as a minimum during the growing season, with mowing scheduled weekly or as needed during periods of heavy growth. All grass clippings shall be removed from the basin area and disposed of properly.