

## Larkin, Elizabeth

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**From:** Lisa L. Feinberg <LFeinberg@carmodylaw.com>  
**Sent:** Friday, October 15, 2021 6:22 PM  
**To:** Conklin, Mike  
**Cc:** Larkin, Elizabeth  
**Subject:** 141 Danbury Road  
**Attachments:** F0173-02 Pollutant Removals - rev 10-15-21.pdf; CDS New Jersey TSS Approval.pdf

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Mike,

Here are the revised pollutant loading calculations and the study for the CDS system requested by Alan. Erik explained that the NJCAT study is the standard in the northeast for water quality structures and was on the CDS website too. It uses a much lower removal rate of 50%, which we have now used. However, we were previously using a very conservative removal number for the infiltration systems that we have since revised to better align with common practice, and the Deebo and Reese book cited. Lastly, we used MassDEP Stormwater Handbook (right off their webpage today) for a reference on removal rates for deep sump catch basins. This handbook allows up to 25% for TSS reduction; however, we conservatively used 5% in our calculations. All told we are now at 88% removal, which is 5% better than we were before.

I kindly request that you provide this information to Alan and request confirmation that we have satisfactorily addressed all of his concerns. As you know, we need to close the hearing on 10/28 so we are eager to hear from him soon should he have any additional comments or concerns. As is your typical protocol, please also provide this information to the Commission and post on the website. Many thanks.

Have a nice weekend.

Lisa

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### Water Quality Area 1

| Item                         | Units      | Pollutant |       |       |       |       |       |
|------------------------------|------------|-----------|-------|-------|-------|-------|-------|
|                              |            | TKN       | P     | TSS   | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.067     | 0.013 | 3.550 | 0.005 | 0.001 | 0.005 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.040     | 0.003 | 0.169 | 0.002 | 0.000 | 0.000 |
| Reduction, Pre to Post Treat | ---        | 40%       | 78%   | 95%   | 64%   | 70%   | 90%   |

### Water Quality Area 2

| Item                         | Units      | Pollutant |       |       |       |       |       |
|------------------------------|------------|-----------|-------|-------|-------|-------|-------|
|                              |            | TKN       | P     | TSS   | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.183     | 0.037 | 9.715 | 0.014 | 0.003 | 0.013 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.109     | 0.008 | 0.461 | 0.005 | 0.001 | 0.001 |
| Reduction, Pre to Post Treat | ---        | 40%       | 78%   | 95%   | 64%   | 70%   | 90%   |

### Water Quality Area 3

| Item                         | Units      | Pollutant |       |       |       |       |       |
|------------------------------|------------|-----------|-------|-------|-------|-------|-------|
|                              |            | TKN       | P     | TSS   | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.043     | 0.009 | 2.293 | 0.003 | 0.001 | 0.003 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.031     | 0.006 | 0.229 | 0.002 | 0.001 | 0.002 |
| Reduction, Pre to Post Treat | ---        | 27%       | 33%   | 90%   | 32%   | 32%   | 32%   |

### Water Quality Area 4

| Item                         | Units      | Pollutant |       |       |       |       |       |
|------------------------------|------------|-----------|-------|-------|-------|-------|-------|
|                              |            | TKN       | P     | TSS   | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.042     | 0.008 | 2.240 | 0.003 | 0.001 | 0.003 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.031     | 0.006 | 0.224 | 0.002 | 0.000 | 0.002 |
| Reduction, Pre to Post Treat | ---        | 27%       | 33%   | 90%   | 32%   | 32%   | 32%   |

### Water Quality Area 5

| Item                         | Units      | Pollutant |       |       |       |       |       |
|------------------------------|------------|-----------|-------|-------|-------|-------|-------|
|                              |            | TKN       | P     | TSS   | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.080     | 0.016 | 4.261 | 0.006 | 0.001 | 0.006 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.048     | 0.010 | 0.852 | 0.002 | 0.001 | 0.002 |
| Reduction, Pre to Post Treat | ---        | 40%       | 40%   | 80%   | 60%   | 60%   | 60%   |

### Water Quality Area 6

| Item                         | Units      | Pollutant |       |       |       |       |       |
|------------------------------|------------|-----------|-------|-------|-------|-------|-------|
|                              |            | TKN       | P     | TSS   | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.000     | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.000     | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Reduction, Pre to Post Treat | ---        | ---       | ---   | ---   | ---   | ---   | ---   |

### Water Quality Area 7

| Item                         | Units      | Pollutant |       |       |       |       |       |
|------------------------------|------------|-----------|-------|-------|-------|-------|-------|
|                              |            | TKN       | P     | TSS   | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.000     | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.000     | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Reduction, Pre to Post Treat | ---        | ---       | ---   | ---   | ---   | ---   | ---   |

### Water Quality Area 8

| Item                         | Units      | Pollutant |       |       |       |       |       |
|------------------------------|------------|-----------|-------|-------|-------|-------|-------|
|                              |            | TKN       | P     | TSS   | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.041     | 0.008 | 2.165 | 0.003 | 0.001 | 0.003 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.033     | 0.003 | 1.083 | 0.002 | 0.000 | 0.000 |
| Reduction, Pre to Post Treat | ---        | 18%       | 67%   | 50%   | 47%   | 56%   | 85%   |

### Total Site

| Item                         | Units      | Pollutant |       |        |       |       |       |
|------------------------------|------------|-----------|-------|--------|-------|-------|-------|
|                              |            | TKN       | P     | TSS    | Pb    | Cu    | Zn    |
| Proposed, Pre Treatment      | lb/yr/1-in | 0.456     | 0.092 | 24.226 | 0.035 | 0.008 | 0.032 |
| Proposed, Post Treatment     | lb/yr/1-in | 0.292     | 0.035 | 3.018  | 0.015 | 0.003 | 0.009 |
| Reduction, Pre to Post Treat | ---        | 36%       | 62%   | 88%    | 56%   | 60%   | 73%   |

## Loading Calculation

Location: **Area 1** Condition: **Proposed**  
 Rainfall: 1 inches  
 Impervious Fraction: 0.32 Total Area = 0.396 acres

| Pollutant                                      | Residential                          |               | Weighted      |               |
|--|--------------------------------------|---------------|---------------|---------------|
|  | A<br>(acres)                         | EMC<br>(mg/L) | EMC<br>(mg/L) | L<br>(lbs/yr) |
| Total Nitrogen (N)                             | 0.396                                | 1.900         | 1.900         | 0.067         |
| Total Phosphorus (P)                           | 0.396                                | 0.383         | 0.383         | 0.013         |
| Total Suspended Solids                         | 0.396                                | 101.0         | 101.0         | 3.6           |
| Lead   | 0.396                                | 0.144         | 0.144         | 0.005         |
| Copper   | 0.396                                | 0.033         | 0.033         | 0.001         |
| Zinc   | 0.396                                | 0.135         | 0.135         | 0.005         |
| $L = 0.2266 * EMC * [0.15 + 0.75 * I] * P * A$ |                                      |               |               |               |
| L  | Pollution Loading (lbs/year)         |               |               |               |
| EMC  | Mean Event Mean Concentration (mg/L) |               |               |               |
| I  | Fraction of Impervious Acres (acres) |               |               |               |
| P  | Annual Rainfall (in)                 |               |               |               |
| A  | Watershed Area (acres)               |               |               |               |

### Notes:

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese

Location: **Area 1** Condition: **Proposed**  
Rainfall: 1 inches  
Impervious Fraction: 0.32 Total Area = 0.396 acres  
BMP: **Deep Sump Catch Basins**

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(%) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.067                             | 0.067          | 0         | 0.00              | 0.067         |
| Total Phosphorus (P)   | 0.013                             | 0.013          | 0         | 0.00              | 0.013         |
| Total Suspended Solids | 3.550                             | 3.6            | 5         | 0.18              | 3.4           |
| Lead                   | 0.005                             | 0.005          | 0         | 0.00              | 0.005         |
| Copper                 | 0.001                             | 0.001          | 0         | 0.00              | 0.001         |
| Zinc                   | 0.005                             | 0.005          | 0         | 0.00              | 0.005         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechs CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

Location: **Area 1** Condition: **Proposed**  
Rainfall: 1 inches  
Impervious Fraction: 0.32 Total Area = 0.396 acres  
BMP: **Water Quality Structure**

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(%) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.067                             | 0.067          | 18.3      | 0.01              | 0.055         |
| Total Phosphorus (P)   | 0.013                             | 0.013          | 66.9      | 0.01              | 0.004         |
| Total Suspended Solids | 3.373                             | 3.4            | 50        | 1.69              | 1.7           |
| Lead                   | 0.005                             | 0.005          | 46.5      | 0.00              | 0.003         |
| Copper                 | 0.001                             | 0.001          | 56.2      | 0.00              | 0.001         |
| Zinc                   | 0.005                             | 0.005          | 85.3      | 0.00              | 0.001         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechs CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

Location: **Area 1** Condition: **Proposed**  
Rainfall: 1 inches  
Impervious Fraction: 0.32 Total Area = 0.396 acres  
BMP: **Infiltration System**

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(-) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.055                             | 0.055          | 27        | 0.01              | 0.040         |
| Total Phosphorus (P)   | 0.004                             | 0.004          | 33        | 0.00              | 0.003         |
| Total Suspended Solids | 1.686                             | 1.7            | 90        | 1.52              | 0.169         |
| Lead                   | 0.003                             | 0.003          | 32        | 0.00              | 0.002         |
| Copper                 | 0.001                             | 0.001          | 32        | 0.00              | 0.000         |
| Zinc                   | 0.001                             | 0.001          | 32        | 0.00              | 0.000         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechs CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

## Loading Calculation

Location: **Area 2** Condition: **Proposed**  
 Rainfall: 1 inches  
 Impervious Fraction: 0.38 Total Area = 0.969 acres

| Pollutant                                      | Residential                          |               | Weighted      |               |
|--|--------------------------------------|---------------|---------------|---------------|
|  | A<br>(acres)                         | EMC<br>(mg/L) | EMC<br>(mg/L) | L<br>(lbs/yr) |
| Total Nitrogen (N)                             | 0.969                                | 1.900         | 1.900         | 0.183         |
| Total Phosphorus (P)                           | 0.969                                | 0.383         | 0.383         | 0.037         |
| Total Suspended Solids                         | 0.969                                | 101.0         | 101.0         | 9.7           |
| Lead   | 0.969                                | 0.144         | 0.144         | 0.014         |
| Copper   | 0.969                                | 0.033         | 0.033         | 0.003         |
| Zinc   | 0.969                                | 0.135         | 0.135         | 0.013         |
| $L = 0.2266 * EMC * [0.15 + 0.75 * I] * P * A$ |                                      |               |               |               |
| L  | Pollution Loading (lbs/year)         |               |               |               |
| EMC  | Mean Event Mean Concentration (mg/L) |               |               |               |
| I  | Fraction of Impervious Acres (acres) |               |               |               |
| P  | Annual Rainfall (in)                 |               |               |               |
| A  | Watershed Area (acres)               |               |               |               |

### Notes:

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese



Location: **Area 2** Condition: **Proposed**  
Rainfall: 1 inches  
Impervious Fraction: 0.38 Total Area = 0.969 acres  
BMP: **Deep Sump Catch Basins**

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(%) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.183                             | 0.183          | 0         | 0.00              | 0.183         |
| Total Phosphorus (P)   | 0.037                             | 0.037          | 0         | 0.00              | 0.037         |
| Total Suspended Solids | 9.715                             | 9.7            | 5         | 0.49              | 9.2           |
| Lead                   | 0.014                             | 0.014          | 0         | 0.00              | 0.014         |
| Copper                 | 0.003                             | 0.003          | 0         | 0.00              | 0.003         |
| Zinc                   | 0.013                             | 0.013          | 0         | 0.00              | 0.013         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechs CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

Location: **Area 2** Condition: **Proposed**  
Rainfall: 1 inches  
Impervious Fraction: 0.38 Total Area = 0.969 acres  
BMP: **Water Quality Structure**

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(%) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.183                             | 0.183          | 18.3      | 0.03              | 0.149         |
| Total Phosphorus (P)   | 0.037                             | 0.037          | 66.9      | 0.02              | 0.012         |
| Total Suspended Solids | 9.230                             | 9.2            | 50        | 4.61              | 4.6           |
| Lead                   | 0.014                             | 0.014          | 46.5      | 0.01              | 0.007         |
| Copper                 | 0.003                             | 0.003          | 56.2      | 0.00              | 0.001         |
| Zinc                   | 0.013                             | 0.013          | 85.3      | 0.01              | 0.002         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
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4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

Location: **Area 2**  
Rainfall: 1 inches  
Impervious Fraction: 0.38  
BMP: **Infiltration System**

Condition: **Proposed**

Total Area = 0.969 acres

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(-) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.149                             | 0.149          | 27        | 0.04              | 0.109         |
| Total Phosphorus (P)   | 0.012                             | 0.012          | 33        | 0.00              | 0.008         |
| Total Suspended Solids | 4.615                             | 4.6            | 90        | 4.15              | 0.5           |
| Lead                   | 0.007                             | 0.007          | 32        | 0.00              | 0.005         |
| Copper                 | 0.001                             | 0.001          | 32        | 0.00              | 0.001         |
| Zinc                   | 0.002                             | 0.002          | 32        | 0.00              | 0.001         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechs CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

## Loading Calculation

Location: **Area 3** Condition: **Proposed**  
 Rainfall: 1 inches  
 Impervious Fraction: 0.00 Total Area = 0.668 acres

| Pollutant                                      | Residential                          |               | Weighted      |               |
|--|--------------------------------------|---------------|---------------|---------------|
|  | A<br>(acres)                         | EMC<br>(mg/L) | EMC<br>(mg/L) | L<br>(lbs/yr) |
| Total Nitrogen (N)                             | 0.668                                | 1.900         | 1.900         | 0.043         |
| Total Phosphorus (P)                           | 0.668                                | 0.383         | 0.383         | 0.009         |
| Total Suspended Solids                         | 0.668                                | 101.0         | 101.0         | 2.3           |
| Lead   | 0.668                                | 0.144         | 0.144         | 0.003         |
| Copper   | 0.668                                | 0.033         | 0.033         | 0.001         |
| Zinc   | 0.668                                | 0.135         | 0.135         | 0.003         |
| $L = 0.2266 * EMC * [0.15 + 0.75 * I] * P * A$ |                                      |               |               |               |
| L  | Pollution Loading (lbs/year)         |               |               |               |
| EMC  | Mean Event Mean Concentration (mg/L) |               |               |               |
| I  | Fraction of Impervious Acres (acres) |               |               |               |
| P  | Annual Rainfall (in)                 |               |               |               |
| A  | Watershed Area (acres)               |               |               |               |

### Notes:

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese

Location: **Area 3**  
Rainfall: 1 inches  
Impervious Fraction: 0.00  
BMP: **Infiltration System**

Condition: **Proposed**

Total Area = 0.668 acres

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(-) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.043                             | 0.043          | 27        | 0.01              | 0.031         |
| Total Phosphorus (P)   | 0.009                             | 0.009          | 33        | 0.00              | 0.006         |
| Total Suspended Solids | 2.293                             | 2.3            | 90        | 2.06              | 0.2           |
| Lead                   | 0.003                             | 0.003          | 32        | 0.00              | 0.002         |
| Copper                 | 0.001                             | 0.001          | 32        | 0.00              | 0.001         |
| Zinc                   | 0.003                             | 0.003          | 32        | 0.00              | 0.002         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechns CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

## Loading Calculation

Location: **Area 4** Condition: **Proposed**  
 Rainfall: 1 inches  
 Impervious Fraction: 0.00 Total Area = 0.653 acres

| Pollutant                                      | Residential                          |               | Weighted      |               |
|--|--------------------------------------|---------------|---------------|---------------|
|  | A<br>(acres)                         | EMC<br>(mg/L) | EMC<br>(mg/L) | L<br>(lbs/yr) |
| Total Nitrogen (N)                             | 0.653                                | 1.900         | 1.900         | 0.042         |
| Total Phosphorus (P)                           | 0.653                                | 0.383         | 0.383         | 0.008         |
| Total Suspended Solids                         | 0.653                                | 101.0         | 101.0         | 2.2           |
| Lead   | 0.653                                | 0.144         | 0.144         | 0.003         |
| Copper   | 0.653                                | 0.033         | 0.033         | 0.001         |
| Zinc   | 0.653                                | 0.135         | 0.135         | 0.003         |
| $L = 0.2266 * EMC * [0.15 + 0.75 * I] * P * A$ |                                      |               |               |               |
| L  | Pollution Loading (lbs/year)         |               |               |               |
| EMC  | Mean Event Mean Concentration (mg/L) |               |               |               |
| I  | Fraction of Impervious Acres (acres) |               |               |               |
| P  | Annual Rainfall (in)                 |               |               |               |
| A  | Watershed Area (acres)               |               |               |               |

### Notes:

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese

Location: **Area 4**  
Rainfall: 1 inches  
Impervious Fraction: 0.00  
BMP: **Infiltration System**

Condition: **Proposed**

Total Area = 0.653 acres

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(-) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.042                             | 0.042          | 27        | 0.01              | 0.031         |
| Total Phosphorus (P)   | 0.008                             | 0.008          | 33        | 0.00              | 0.006         |
| Total Suspended Solids | 2.240                             | 2.2            | 90        | 2.02              | 0.2           |
| Lead                   | 0.003                             | 0.003          | 32        | 0.00              | 0.002         |
| Copper                 | 0.001                             | 0.001          | 32        | 0.00              | 0.000         |
| Zinc                   | 0.003                             | 0.003          | 32        | 0.00              | 0.002         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechs CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

## Loading Calculation

Location: **Area 5** Condition: **Proposed**  
Rainfall: 1 inches  
Impervious Fraction: 0.39 Total Area = 0.419 acres

| Pollutant                                      | Residential                          |               | Weighted      |               |
|--|--------------------------------------|---------------|---------------|---------------|
|  | A<br>(acres)                         | EMC<br>(mg/L) | EMC<br>(mg/L) | L<br>(lbs/yr) |
| Total Nitrogen (N)                             | 0.419                                | 1.900         | 1.900         | 0.080         |
| Total Phosphorus (P)                           | 0.419                                | 0.383         | 0.383         | 0.016         |
| Total Suspended Solids                         | 0.419                                | 101.0         | 101.0         | 4.3           |
| Lead   | 0.419                                | 0.144         | 0.144         | 0.006         |
| Copper   | 0.419                                | 0.033         | 0.033         | 0.001         |
| Zinc   | 0.419                                | 0.135         | 0.135         | 0.006         |
| $L = 0.2266 * EMC * [0.15 + 0.75 * I] * P * A$ |                                      |               |               |               |
| L  | Pollution Loading (lbs/year)         |               |               |               |
| EMC  | Mean Event Mean Concentration (mg/L) |               |               |               |
| I  | Fraction of Impervious Acres (acres) |               |               |               |
| P  | Annual Rainfall (in)                 |               |               |               |
| A  | Watershed Area (acres)               |               |               |               |

### Notes:

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese



Location: **Area 5**  
 Rainfall: 1 inches  
 Impervious Fraction: 0.39  
 BMP: **Porous Pavement**

Condition: **Proposed**

Total Area = 0.419 acres

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(-) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.080                             | 0.080          | 40        | 0.03              | 0.048         |
| Total Phosphorus (P)   | 0.016                             | 0.016          | 40        | 0.01              | 0.010         |
| Total Suspended Solids | 4.261                             | 4.3            | 80        | 3.41              | 0.9           |
| Lead                   | 0.006                             | 0.006          | 60        | 0.00              | 0.002         |
| Copper                 | 0.001                             | 0.001          | 60        | 0.00              | 0.001         |
| Zinc                   | 0.006                             | 0.006          | 60        | 0.00              | 0.002         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechs CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications

## Loading Calculation

Location: **Area 8** Condition: **Proposed**  
 Rainfall: 1 inches  
 Impervious Fraction: 0.27 Total Area = 0.271 acres

| Pollutant                                      | Residential                          |               | Weighted      |               |
|--|--------------------------------------|---------------|---------------|---------------|
|  | A<br>(acres)                         | EMC<br>(mg/L) | EMC<br>(mg/L) | L<br>(lbs/yr) |
| Total Nitrogen (N)                             | 0.271                                | 1.900         | 1.900         | 0.041         |
| Total Phosphorus (P)                           | 0.271                                | 0.383         | 0.383         | 0.008         |
| Total Suspended Solids                         | 0.271                                | 101.0         | 101.0         | 2.2           |
| Lead   | 0.271                                | 0.144         | 0.144         | 0.003         |
| Copper   | 0.271                                | 0.033         | 0.033         | 0.001         |
| Zinc   | 0.271                                | 0.135         | 0.135         | 0.003         |
| $L = 0.2266 * EMC * [0.15 + 0.75 * I] * P * A$ |                                      |               |               |               |
| L  | Pollution Loading (lbs/year)         |               |               |               |
| EMC  | Mean Event Mean Concentration (mg/L) |               |               |               |
| I  | Fraction of Impervious Acres (acres) |               |               |               |
| P  | Annual Rainfall (in)                 |               |               |               |
| A  | Watershed Area (acres)               |               |               |               |

### Notes:

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese

Location: **Area 8** Condition: **Proposed**  
Rainfall: 1 inches  
Impervious Fraction: 0.27 Total Area = 0.271 acres  
BMP: **Water Quality Structure**

| Pollutant              | Lin 1<br>(lbs)                    | Sum L<br>(lbs) | RR<br>(-) | Lremoved<br>(lbs) | Lout<br>(lbs) |
|------------------------|-----------------------------------|----------------|-----------|-------------------|---------------|
| Total Nitrogen (N)     | 0.041                             | 0.041          | 18.3      | 0.01              | 0.033         |
| Total Phosphorus (P)   | 0.008                             | 0.008          | 66.9      | 0.01              | 0.003         |
| Total Suspended Solids | 2.165                             | 2.2            | 50        | 1.08              | 1.1           |
| Lead                   | 0.003                             | 0.003          | 46.5      | 0.00              | 0.002         |
| Copper                 | 0.001                             | 0.001          | 56.2      | 0.00              | 0.000         |
| Zinc                   | 0.003                             | 0.003          | 85.3      | 0.00              | 0.000         |
| Lin 1                  | Pollutant Load In                 |                |           |                   |               |
| Sum L                  | Sum of Pollutant Load to this BMP |                |           |                   |               |
| RR                     | Removal rate in percentage        |                |           |                   |               |
| Lout                   | Pollutant Load out of BMP         |                |           |                   |               |

**Notes:**

1. Pollution loading calculated using *Municipal Stormwater Management* by Debo & Reese
2. Pollutant removal rates for Infiltration Practices taken from *Municipal Stormwater Management* by Debo & Reese, Table 13-13
3. Pollutant removal rates for Contechs CDS Unit water quality structure taken from NJCAT TSS Approval letter, January 9, 2015
4. Pollutant removal rates for Deep Sump Catch Basins taken from MassDEP Stormwater Handbook Volume 2 - Structural BMP Specifications



## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Nonpoint Pollution Control

Division of Water Quality

401-02B

Post Office Box 420

Trenton, New Jersey 08625-0420

609-633-7021 Fax: 609-777-0432

[http://www.state.nj.us/dep/dwq/bnpc\\_home.htm](http://www.state.nj.us/dep/dwq/bnpc_home.htm)

CHRIS CHRISTIE

Governor

KIM GUADAGNO

Lt. Governor

BOB MARTIN

Commissioner

January 9, 2015

Derek M. Berg  
CONTECH Engineered Solutions, LLC  
71 US Route 1, Suite F  
Scarborough, ME 04074

Re: MTD Lab Certification for the  
Continuous Deflective Separator (CDS<sup>®</sup>) Stormwater Treatment Device  
By Contech Engineered Solutions LLC

### **TSS Removal Rate 50%**

Dear Mr. Berg:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7 (c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Contech Engineered Solutions, LLC has requested a Laboratory Certification for the CDS<sup>®</sup> Stormwater Treatment Device.

The projects falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

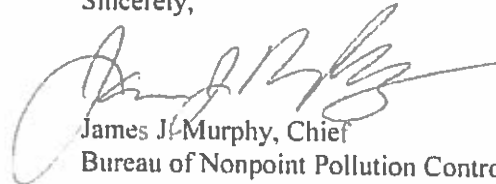
NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the Continuous Deflective Separator (CDS<sup>®</sup>) Stormwater Treatment Device by Contech Engineered Solutions LLC at a TSS removal rate of 50% when designed, operated and maintained in accordance with the information provided in the Verification Appendix.

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Practices Manual.

If you have any questions regarding the above information, please contact Mr. Titus Magnanao of my office at (609) 633-7021.

Sincerely,

A handwritten signature in black ink, appearing to read "James J. Murphy".

James J. Murphy, Chief  
Bureau of Nonpoint Pollution Control

C: Chron File  
Richard Magee, NJCAT  
Madhu Guru, DLUR  
Ravi Patraju, NJDEP  
Elizabeth Dragon, BNPC  
Titus Magnanao, BNPC

## CDS® Inspection and Maintenance Guide – New Jersey

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## Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

## Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine whether the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump. Refer to Table 1 for depth

from water surface to top of sediment pile for each model size indicating that maintenance is required.

## Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.



| CDS Model | Diameter |     | Distance from Water Surface to Top of Sediment Pile <sup>1</sup> |     | Sediment Storage Capacity |                |
|-----------|----------|-----|--|-----|---------------------------|----------------|
|           | ft       | m   | ft   | m   | yd <sup>3</sup>           | m <sup>3</sup> |
| CDS-4     | 4        | 1.2 | 3.0  | 0.9 | 0.9                       | 0.7            |
| CDS-5     | 5        | 1.5 | 3.7  | 1.1 | 1.5                       | 1.1            |
| CDS-6     | 6        | 1.8 | 4.7  | 1.4 | 2.1                       | 1.6            |
| CDS-8     | 8        | 2.4 | 5.8  | 1.8 | 3.7                       | 2.8            |
| CDS-10    | 10       | 3.0 | 7.4  | 2.3 | 5.8                       | 4.4            |
| CDS-12    | 12       | 3.4 | 8.0  | 2.4 | 8.4                       | 6.4            |

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

<sup>1</sup> Distances from water surface to top of sediment pile are based on 75% of sump capacity being occupied.



#### Support

- Drawings and specifications are available at [www.contechstormwater.com](http://www.contechstormwater.com).
- Site-specific design support is available from our engineers.

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cdsMaintenance 11/14

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## CDS Inspection & Maintenance Log

CDS Model: \_\_\_\_\_ Location: \_\_\_\_\_

| Date | Water depth to sediment <sup>1</sup> | Floatable Layer Thickness <sup>2</sup> | Describe Maintenance Performed | Maintenance Personnel | Comments |
|------|--------------------------------------|--|--------------------------------|-----------------------|----------|
|      |                                      |  |                                |                       |          |
|      |                                      |  |                                |                       |          |
|      |                                      |  |                                |                       |          |
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|      |                                      |  |                                |                       |          |
|      |                                      |  |                                |                       |          |
|      |                                      |  |                                |                       |          |
|      |                                      |  |                                |                       |          |

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note:** to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.
2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.