TO: John Rashid, Facilities Management – Director
FROM: Erik Larson, Facilities Management - Sr. Engineer
SUBJECT: Summary of 2015 Inspection of Facilities Management’s Structural Storm Water Devices, Outfalls, and Ponds (UMD SWPPP 6b-2 / 6b-3 / 6b-5)

The annual inspections of the Facilities Management structural storm water devices, approximately 20% of UMD’s outfalls, and UMD ponds per the MPCA’s MS4’s storm water permit MN R580000 were completed this fall. While the majority of our features appear to be operating appropriately, there are a few items that should be addressed. A prioritized summary with recommendations follows. My recommendation is that those described as high priority should be addressed this summer and low priority items maybe deferred and reviewed again this fall to see if they continue to be a problem.

HIGH PRIORITY

ST3113 Erik Clarke Pond
There is a beaver creating a dam inside the weir of this pond. This was cleaned out several times this summer / fall and will need to continue to be monitored.

MEDIUM PRIORITY

ST3963 Bagley Classroom Green Roof
There are weeds and small trees growing in the green roof media. I recommend weeding the roof and creating a regular maintenance plan.

ST6193 Lot B Rain Garden
Part of the Lot B side retaining wall has been slightly damaged. I recommend repairing the wall.

LOW PRIORITY

ST2020 Chester Park Manhole
This storm manhole has a sanitary cover. I recommend switching covers with the adjacent sanitary manhole.

ST3143 CUB Rain Garden
There were excessive weeds in this rain garden and the outlet area shows inhibited growth. I recommend a specific weeding of this rain garden and replanting the area below the outlet.

ST4933 LSB E South Rain Garden
The gate in the Agridrain is down but the water level is down. I recommend investigating the water level in the summer for a leaking seal or a short circuit around control structure.

ST5665 WBTC Outfall from Water Mater Vault
Pipe has excessive amount of mud. I recommend cleaning this pipe the next time pipes are cleaned.
The rest of our structural storm water devices, the outfalls inspected, and the ponds appear to be functioning as intended. Unless I am directed otherwise, I will proceed to correct the high and medium priority issues assuming I am funded with an R&R 17 Storm Water PM project (R&R 16 Storm Water PM has been spent in its entirety already). I will take a look at the low priority issues if time and storm water funds allow.

Update on last year’s issues:

**High Priority**
- ST4903 – Clean out forbay – Cleaned - April 2015
- ST5146 – Clean Stormceptor – Cleaned - July 2015
- ST6213 – Repair Pervious Pavers—Completed – December 2015
- ST4413 – Replant after Water main break –Not Done as of 11/2/15 Inspection – Additional construction was happening in this location this summer/fall.

**Low Priority**
- ST4373 – Add Grit to pervious Pavers –Completed - April 2015
- ST4933 – Investigate water level in AgriDrain. – Low Priority – Not Done – On this year’s list again
- ST5023 – Additional Planting –Completed – Summer 2015
- ST5223 – Additional Planting – Completed – Summer 2015
- ST5233 – Additional Planting – Completed – Summer 2015
- ST6090 – Protect rings from deteriorating – Low Priority – Not Done

If you have any questions regarding these inspections please contact me at (218) 726-6915 or elarson@d.umn.edu.

Thanks.

Enclosures:
- Inspection Reports: ST3113
  - ST3963
  - ST6193
  - ST2020
  - ST3143
  - ST4933
  - ST5665

C: UMD Storm Water Steering Committee
Outfall #: ___________________ Photograph Name: 15-ST3113 Inspection Date: 11/2/2015

Pond Name: Eric Clarke Location: Eric Clarke Pond

Mechanical Structure #: ST3113 Type: Sediment Pond

Inspector: Erik J. Larson

Weather: Air Temperature: 26 Rain: Y [N] Date of Last Rain: 11/01/15 Sunny Cloudy

Describe drainage area: Housing areas/ Parking areas/ Maplewood Ct. Date of Last Inspection: 10/31/2014

Shared Use: Y N

Describe: Housing / Parking / Roadway

**Physical Observations**

<table>
<thead>
<tr>
<th>Odor</th>
<th>None</th>
<th>Sewage</th>
<th>Sulfide</th>
<th>Oil</th>
<th>Gas</th>
<th>Rancid-Sour</th>
<th>Other: ________________</th>
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</table>

<table>
<thead>
<tr>
<th>Color</th>
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<th>Dark Brown</th>
<th>Light Brown</th>
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<table>
<thead>
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<table>
<thead>
<tr>
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<table>
<thead>
<tr>
<th>Depth of Sediment:</th>
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<th>Remaining Capacity: ___________</th>
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</table>

<table>
<thead>
<tr>
<th>Work Needed:</th>
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</table>

<table>
<thead>
<tr>
<th>Floatables:</th>
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<th>Sheen</th>
<th>Foam</th>
<th>Sewage</th>
<th>Litter</th>
<th>Other: ________________</th>
<th>Sample Collected: Y N</th>
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<table>
<thead>
<tr>
<th>Oil in Oil Port:</th>
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<th>Measurement: ___________</th>
<th>Calculated: ___________</th>
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<table>
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<tr>
<th>Work Needed:</th>
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<table>
<thead>
<tr>
<th>Vegetation Conditions:</th>
<th>Normal</th>
<th>Excessive Growth</th>
<th>Inhibited Growth</th>
<th>Describe: Beaver Damage</th>
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<table>
<thead>
<tr>
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<th>Minor Erosion</th>
<th>Major Erosion</th>
<th>Erosion Protected</th>
<th>Y N</th>
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<table>
<thead>
<tr>
<th>Condition:</th>
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<th>Average</th>
<th>Poor</th>
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|-------|---------------------------|-----------------------------|-----------------------------|

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<table>
<thead>
<tr>
<th>Water Temperature:</th>
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<th>Not Available</th>
</tr>
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</table>

**Inspection Comments / Recommendations**

Comments / Recommendations

Outlet structure installed 2009

Beaver creating dams inside outlet structure

Grounds cleaned out MH several times

Beaver taking down trees

Y N

MPCA Permit Requirements (Annual)

Section V.G.6.b.2-6

* Inspection of structural pollution control devices
* Inspect 20% of outfalls and ponds
* Note repair, replacement, and/or maintenance needed including schedule for completion
* Summarize inspection results for annual report

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**STORM WATER INSPECTION FORM**

<table>
<thead>
<tr>
<th>Outfall #</th>
<th>Photograph Name</th>
<th>Inspection Date</th>
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<tbody>
<tr>
<td></td>
<td>15-ST3963</td>
<td>10/12/2015</td>
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<table>
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<th>Pond Name</th>
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<td>11/6/2014</td>
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<table>
<thead>
<tr>
<th>Mechanical Structure #</th>
<th>Type</th>
<th>Location</th>
<th>Inspector</th>
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<tbody>
<tr>
<td>ST3963</td>
<td>Green Roof</td>
<td>Bagley Classroom</td>
<td>Erik J. Larson</td>
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<table>
<thead>
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<th>Weather</th>
<th>Air Temperature</th>
<th>Rain</th>
<th>Date of Last Rain</th>
<th>Weather Conditions</th>
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<tr>
<td></td>
<td>55</td>
<td>Y N</td>
<td>10/12/2015</td>
<td>Sunny Cloudy</td>
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<thead>
<tr>
<th>Describe drainage area</th>
<th>Shared Use</th>
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<tbody>
<tr>
<td>Bagley Classroom Roof</td>
<td>Y</td>
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<table>
<thead>
<tr>
<th>Physical Observations</th>
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<table>
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<th>Condition of Device</th>
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<th>Poor</th>
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<tbody>
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<td></td>
<td>Y N</td>
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<table>
<thead>
<tr>
<th>Any Materials Within Structure</th>
<th>Deteriorating</th>
<th>Describe</th>
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<td></td>
<td>Y N</td>
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<tr>
<th>Releasing Pollution</th>
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<th>Capacity of Pipe</th>
<th>Size of pipe</th>
<th>Depth of Water</th>
<th>Has Source of Flow Been Determined</th>
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<td>Y N</td>
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<th>Less Than Half</th>
<th>Greater Than Half</th>
<th>Full</th>
<th>Amount Remaining</th>
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<table>
<thead>
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<table>
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<th>Describe</th>
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<table>
<thead>
<tr>
<th>Water Temperature</th>
<th>Description</th>
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<td>F</td>
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<table>
<thead>
<tr>
<th>Accumulated Materials</th>
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<table>
<thead>
<tr>
<th>Floatables</th>
<th>Oil in Oil Port</th>
<th>Measurement</th>
<th>Sample Collected</th>
<th>Describe Work Needed</th>
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<tbody>
<tr>
<td>None</td>
<td>Y N</td>
<td>N/A</td>
<td>Y N</td>
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<table>
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<th>Deposits</th>
<th>Sediment</th>
<th>Oil</th>
<th>Measurement</th>
<th>Sample Collected</th>
<th>Describe Work Needed</th>
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<tbody>
<tr>
<td>None</td>
<td>N/A</td>
<td>Y N</td>
<td></td>
<td>Y N</td>
<td></td>
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<table>
<thead>
<tr>
<th>Stains</th>
<th>Describe</th>
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<tbody>
<tr>
<td>Y N</td>
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<table>
<thead>
<tr>
<th>Vegetation Conditions</th>
<th>Describe Work Needed</th>
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<tbody>
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<table>
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<tr>
<th>Erosion</th>
<th>Describe Work Needed</th>
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<tbody>
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<td>None</td>
<td>N/A</td>
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</table>

<table>
<thead>
<tr>
<th>Immediate Work Needed</th>
<th>Describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y N</td>
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<table>
<thead>
<tr>
<th>Next Anticipated Work Date</th>
<th>Spring/Summer 2016</th>
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</table>

**Inspection Comments / Recommendations**

<table>
<thead>
<tr>
<th>Comments / Recommendations</th>
<th>Completed</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Spring 2010</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td>Needs weeding</td>
<td>Y N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Y N</td>
<td></td>
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</table>

N 46 49.423
W 92 05.141

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**STORM WATER INSPECTION FORM**

**Outfall #** : 

**Photograph Name** : 

**Inspection Date** : 10/12/15

**Pond Name** : 

**Date of last inspection** : 10/25/14

**Mechanical Structure #** : ST6193  

**Type** : Rain Garden

**Location** : Behind Lund building & Lot B

**Inspector** : Erik J. Larson

**Weather** : 

- Air Temperature: 55
- Rain: Y
- Date of Last Rain: 10/12/2015
- Sunny
- Cloudy

**Describe drainage area** : South 1/2 of Lot B

**Shared Use** : Y

---

### Physical Observations

#### Condition of Device:
- Good □  Average □  Poor □  Work Needed: Y □  N □

- Describe Work Needed: N/A

#### Any Materials Within Structure:
- Deteriorating: Y □  N □  Describe:

#### Capacity of Pipe:
- Size of pipe: N/A
- Depth of Water: N/A
- Has Source of Flow Been Determined: Y □  N □

- Describe Storage Capacity:
  - Minimal □
  - Less Than Half □
  - Greater Than Half □
  - Full □
  - Amount Remaining: ____________

#### Flow:
- Performing Properly □
- Full □
- Overloaded □
- Clogged □
- Other: ____________

- Work Needed: Y □  N □  Describe:

#### Odor:
- None □  Sewage □  Sulfide □  Oil □  Gas □  Rancid-Sour □  Other: ____________

- Color:
  - Normal □
  - Dark Brown □
  - Light Brown □
  - Other: ____________

#### Turbidity:
- None □
- Cloudy □
- Suspended Particles □
- Other: ____________

#### Water Temperature:
- F □
- Not Available □

### Accumulated Materials

#### Floatables:
- None □  Sheen □  Foam □  Sewage Litter □  Other: ____________

- Oil in Oil Port: Y □  N □  N/A □
- Measurement: ____________

- Describe Work Needed: N/A

#### Deposits:
- None □  Sediment □  Oily □  Describe: Minor in garden □

- Depth of Sediment: N/A □  Measurement: ____________

- Remaining Capacity: ____________

- Describe Work Needed: N/A

#### Stains:
- Y □  N □  Work Needed: Y □  N □  Describe:

#### Vegetation Conditions:
- Normal □  Excessive Growth □  Inhibited Growth □  Describe: Weeds-Thistles

- Erosion:
  - None □  Minor Erosion □  Major Erosion □  Erosion Protected Y □  N □

- Describe Work Needed: N/A

#### Immediate Work Needed:
- Y □  N □  Describe:

- Next Anticipated Work Date:

### Inspection Comments / Recommendations

<table>
<thead>
<tr>
<th>Comments / Recommendations</th>
<th>Completed Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basin needs cleaning</td>
<td>Grounds cleans periodically</td>
</tr>
<tr>
<td>Weeds and trees growing along edges</td>
<td>Grounds checks periodically</td>
</tr>
<tr>
<td>Broken retaining wall needs to be fixed</td>
<td></td>
</tr>
</tbody>
</table>

N 46 48.916
W 92 05.037

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STORM WATER INSPECTION FORM

Outfall #: ST2020
Photograph Name: 15-ST2020
Inspection Date: 11/4/2015

Pond Name:

Mechanical Structure #: Type: Outfall

Location: Field 4 / College Street
Inspector: Erik J. Larson

Weather: Air Temperature: 40 Rain: Y N Date of Last Rain: # Sunny Cloudy

Describe drainage area: Zone 1
Shared Use: Y N Describe:

Physical Observations

Odor: None Sewage Sulfide Oil Gas Rancid-Sour Other: 
Color: None Dark Brown Light Brown Other: 

Turbidity: None Cloudy Opaque
Deposits / Stains: None Sediment Oily Describe: Sample Collected: Y N
Depth of Sediment: N/A Measurement: Remaining Capacity
Describe Work Needed: N/A

Floatables: None Sheen Foam Sewage Litter Other: Sample Collected: Y N
Oil in Oil Port: Y N N/A Measurement: Calculated:
Describe Work Needed: N/A

Vegetation Conditions: Normal Excessive Growth Inhibited Growth Describe:

Erosion: None Minor Erosion Major Erosion Erosion Protected Y N

Condition: Good Average Poor Work Needed: Y N


Water Temperature: F Not Available

Inspection Comments / Recommendations

Comments / Recommendations Completed Date
Cover says "Sanitary" - Should be change to prevent accidental discharge Y N

MPCA Permit Requirements (Annual)

Section V.G.6.b.2-6

* Inspection of structural pollution control devices
* Inspect 20% of outfalls and ponds
* Note repair, replacement, and/or maintenance
* Summarize inspection results for annual report

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STORM WATER INSPECTION FORM

Outfall #: __________________________ Photograph Name: 15-ST3143 Inspection Date: 10/12/15

Pond Name: __________________________ Date of last inspection: 11/04/14

Mechanical Structure #: ST-3143 Type: CUB Rain Garden

Location: 622 W. St. Marie Street

Inspector: Erik J. Larson

Weather: Air Temperature: 55 Rain: Y N Date of Last Rain: 10/12/2015 Sunny Cloudy

Describe drainage area: Building and Driveway

Shared Use: Y N Describe:

Physical Observations

Condition of Device: Good Average Poor Work Needed: Y N

Describe Work Needed: N/A See Vegetation Section

Any Materials Within Structure: Deteriorating: Y N Describe:

Releasing Pollution: Y N Describe:

Capacity of Pipe: Size of pipe: N/A Depth of Water: N/A Has Source of Flow Been Determined: Y N

Source of Water: N/A

Describe Storage Capacity:

Minimal Less Than Half Greater Than Half Full Amount Remaining: ________

Flow: Performing Properly Full Overloaded Clogged Other:

Work Needed: Y N Describe:

Odor: None Sewage Sulfide Oil Gas Rancid-Sour Other:

Color: Normal Dark Brown Light Brown Other:

Turbidity: None Cloudy Suspended Particles Other:

Water Temperature: F Not Available

Accumulated Materials

Floatables: None Sheen Foam Sewage Litter Other:

Sample Collected: Y N

Oil in Oil Port: Y N N/A Measurement: Calculated:

Describe Work Needed: N/A

Deposits: None Sediment Oily Describe:

Sample Collected: Y N

Depth of Sediment: N/A Measurement: Remaining Capacity:

Describe Work Needed: N/A

Stains: Y N Work Needed: Y N Describe:

Vegetation Conditions: Normal Excessive Growth Inhibited Growth Describe: Weeds / Lack of Grass

Describe Work Needed: N/A Weed / Replant Outlet Area

Erosion: None Minor Erosion Major Erosion Erosion Protected Y N

Describe Work Needed:

Immediate Work Needed: Y N Describe:

Next Anticipated Work Date: Spring / Summer 2016

Inspection Comments / Recommendations

Comments / Recommendations Completed Date

Needs Weed Control Y N ______

Outlet location has little ground cover - replant area Y N ______
# STORM WATER INSPECTION FORM

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Photograph Name</td>
<td>15-ST4933</td>
</tr>
<tr>
<td>Inspection Date</td>
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<tr>
<td>Pond Name</td>
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<td>Date of last inspection</td>
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<tr>
<td>Mechanical Structure #</td>
<td>ST4933</td>
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<tr>
<td>Type</td>
<td>Rain Garden</td>
</tr>
<tr>
<td>Location</td>
<td>LSBE South side</td>
</tr>
<tr>
<td>Inspector</td>
<td>Erik J. Larson</td>
</tr>
<tr>
<td>Weather</td>
<td>Air Temperature: 41</td>
</tr>
<tr>
<td>Rain</td>
<td>Y</td>
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<tr>
<td>Date of last Rain</td>
<td>11/1/2015</td>
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<tr>
<td>Shared Use</td>
<td>Y</td>
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<tr>
<td>Date of last inspection</td>
<td>11/4/2014</td>
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<tr>
<td>Describe drainage area</td>
<td>LSBE/Kirby Drive</td>
</tr>
<tr>
<td>Describe</td>
<td>N/A</td>
</tr>
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</table>

## Physical Observations

### Condition of Device
- Good
- Average
- Poor
- Work Needed: Y
- N
- Investigate why water is not being stored behind Agrain

### Any Materials Within Structure
- Deteriorating: Y
- N
- Investigate why water is not being stored behind Agrain

### Capacity of Pipe
- Size of pipe: N/A
- Depth of Water: N/A
- Has Source of Flow Been Determined: Y
- N
- Investigate why water is not being stored behind Agrain

### Flow
- Performing Properly
- Full
- Overloaded
- Clogged
- Other: Agrain is not holding water
- Investigate why water is not being stored behind Agrain

### Work Needed
- Y
- N
- Repair Agrain

### Odor
- None
- Sewage
- Sulfide
- Oil
- Gas
- Rancid-Sour
- Other: Agrain is not holding water
- Investigate why water is not being stored behind Agrain

### Color
- Normal
- Dark Brown
- Light Brown
- Other: Agrain is not holding water
- Investigate why water is not being stored behind Agrain

### Turbidity
- None
- Cloudy
- Suspended Particles
- Other: Agrain is not holding water
- Investigate why water is not being stored behind Agrain

### Water Temperature
- F
- Not Available
- Investigate why water is not being stored behind Agrain

### Accumulated Materials

#### Floatables
- None
- Sheen
- Foam
- Sewage
- Litter
- Other: Agrain is not holding water
- Investigate why water is not being stored behind Agrain

#### Oil in Oil Port
- Y
- N
- N/A
- Investigate why water is not being stored behind Agrain

#### Deposits
- None
- Sediment
- Oily
- Describe: Agrain is not holding water
- Investigate why water is not being stored behind Agrain

#### Depth of Sediment
- N/A
- Measurement: N/A
- Remaining Capacity: N/A
- Investigate why water is not being stored behind Agrain

#### Stains
- Y
- N
- Work Needed: Y
- N
- Investigate why water is not being stored behind Agrain

### Vegetation Conditions
- Normal
- Excessive Growth
- Inhibited Growth
- Describe: Agrain is not holding water
- Investigate why water is not being stored behind Agrain

### Erosion
- None
- Minor Erosion
- Major Erosion
- Erosion Protected
- Y
- N
- Investigate why water is not being stored behind Agrain

### Immediate Work Needed
- Y
- N
- Describe: Agrain is not holding water
- Investigate why water is not being stored behind Agrain

### Inspection Comments / Recommendations

#### Comments / Recommendations
- Completed: Y
- N
- Date: Summer 2016
- Investigate why water is not being stored behind Agrain

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**Area by outlet wet - standing water - from building sump pumps frequent discharge**

**Investigate why water is not being stored behind Agrain**

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N 46 49.179  
W 92 05.116
University of Minnesota Duluth

STORM WATER INSPECTION FORM

Outfall #: ST5665
Photograph Name: 15-ST5665
Inspection Date: 11/2/2015

Pond Name: 

Mechanical Structure #: 
Type: Outfall

Location: SE of Univ. Dr. and W. St. Marie St.

Inspector: Erik J. Larson

Weather:
Air Temperature: 45
Rain: Y N
Date of Last Rain: 11/1/2015
Sunny Cloudy

Describe drainage area: Water meter manhole
Shared Use: Y N

Physical Observations

Odor: None Sewage Sulfide Oil Gas Rancid-Sour Other: 

Color: None Dark Brown Light Brown Other: 

Turbidity: None Cloudy Opaque

Deposits / Stains:
Depth of Sediment: N/A
Measurement: 
Remaining Capacity: 
Describe Work Needed: N/A

Floatables:
Oil in Oil Port: Y N
Measurement: 
Calculated: 
Describe Work Needed: N/A

Vegetation Conditions:

Condition: Good Average Poor

Erosion:

Condition: Good Average Poor

Flow:
Source of Water: N/A

Water Temperature: F Not Available

Inspection Comments / Recommendations

Comments / Recommendations: Pipe should be cleaned
Completed Date 

MPCA Permit Requirements (Annual)

Section V.G.6.b.2-6
* Inspection of structural pollution control devices
* Inspect 20% of outfalls and ponds
* Note repair, replacement, and/or maintenance needed including schedule for completion
* Summarize inspection results for annual report

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