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**Title:** Permit 11-140G: Woodland Cove Lake 4th & 5th Additions, Minnetrista

**Prepared by:** Name: Cole Thompson  
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cthompson@minnehahacreek.org

**Recommendation:**

Approval of the MCWD Permit amendment on the following conditions:

1. Submission of an NPDES permit number;
2. Submission of a declaration for maintenance of stormwater facilities and wetland buffer areas, with the latter incorporating an agreement for buffer establishment, maintenance and buffer monumentation.
3. Financial assurances for:
  - a. Erosion Control, in the amount of: \$32,100.00
  - b. Stormwater Management, in the amount of: \$72,800.00
  - c. Wetland Protection, in the amount of: \$5,000.00
4. Reimbursement of Engineering, Legal, and mailing fees

**Background:**

Woodland Cove LLC & M/I Homes LLC (co-applicants) have applied for a Minnehaha Creek Watershed District (MCWD) permit amendment for the construction of a 164-lot subdivision addition within the Woodland Cove Development. The project is requesting approval to amend the stormwater plan previously approved by the Board in 2011 associated with the overall Woodland Cove Development, under permit #11-140. The proposed means of managing stormwater volume would not achieve the level of management of the plans approved under permit #11-140. For this reason, the application is being brought forward for consideration and action by the Board of Managers.

To provide context, Woodland Cove is a 490-acre development consisting of, once fully built out, approximately 1,071 units on the southwest side of Halsted Bay in the City of Minnetrista. Drainage in the development is generally divided by a topographic break on the site that occurs approximately 1,000 feet north of Highway 7. North of this divide, drainage is ultimately directed toward Lake Minnetonka. South of this divide, the majority of the drainage is directed south toward Stone Lake, with some drainage moving west toward Six Mile Creek (Figure 1).

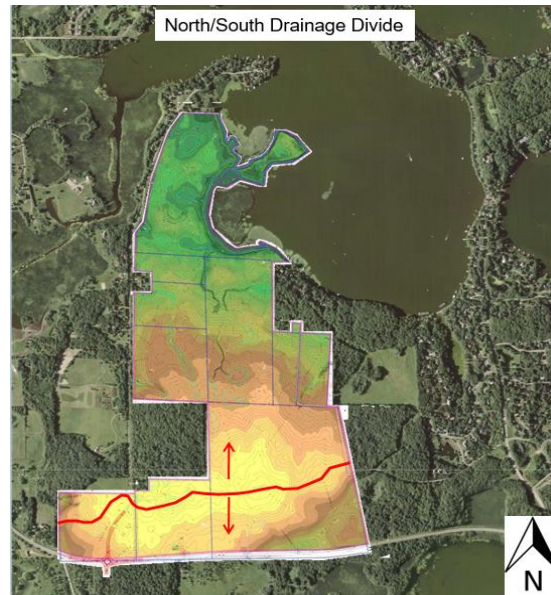


Figure 1: North/South Drainage Divide

The entirety of the Woodland Cove development was permitted under one umbrella application, permit #11-140, approved by the Board of Managers in August of 2011. Though the entire development was approved under one permit application, build-out was anticipated to occur in discrete phases over a period of 10 – 12 years. Each of the discrete phases would then be reviewed for conformity with the overall approval. Since that time, five phases found to be compliant with the overall approval have been issued via staff delegated authority from the Board of Managers. The most recently approved phase (sixth) required Board consideration of the amended stormwater plan due to site constraints identified below. The application for Permit #11-140G is the seventh phase of the Woodland Cove Development.

The designs associated with permit #11-140, specifically the stormwater management design, exceeded the permitting standards at the time of approval. These standards include volume control, rate control, water quality, and protection of downstream waterbodies (which is measured through SEV control to determine bounce and inundation for a given waterbody). Each of these standards is described in more detail in the *Stormwater Management* section.

The application for Permit #11-140G, is a discrete phase of Woodland Cove submitted by Woodland Cove LLC & M/I Homes LLC that drains north toward both Lake Minnetonka, and south toward Stone Lake and Lake Zumbra (Figure 2). The application proposes to amend the stormwater management plan outlined in Permit #11-140, approved by the Board. In other development phases already completed, a number of infiltration basins have been constructed, and there has been an opportunity to observe their performance, which has been poor. Due to these observations, the applicant has provided additional geo-technical testing to characterize the conditions of the proposed best management practice site. Through that geo-technical testing, environmental conditions have been found that, in the assessment of the applicant's engineer, prevent effective infiltration. The District Engineer concurs in this assessment. The Board-approved stormwater design under permit #11-140 relies upon infiltration for function and performance, therefore, its impediment renders the original stormwater design infeasible, given the geo-technical circumstances. In response, the applicant has explored alternative methods of stormwater management that would provide an equivalent amount of treatment (i.e. practices

providing: volume control, rate control, water quality, and prevention of downstream impacts through the measurement of SEV control) as the Board approved design.

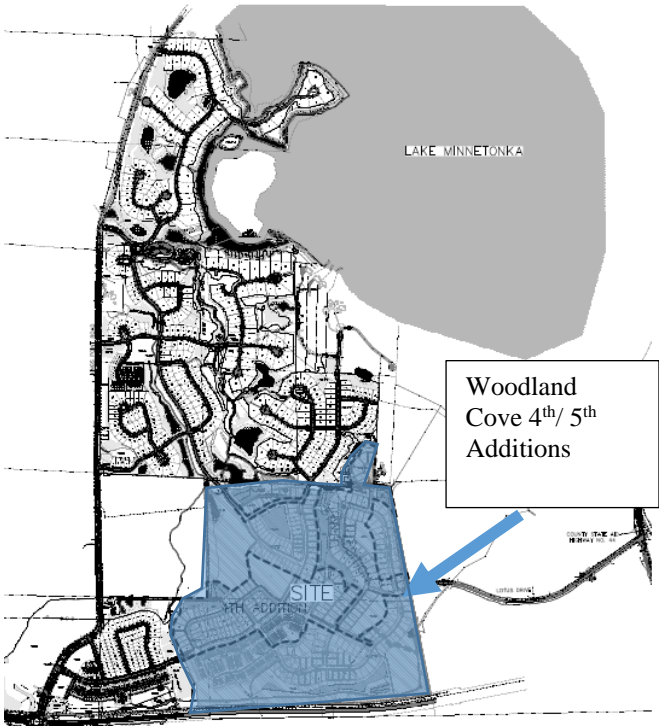


Figure 2: 11-140G Phase Location

In that pursuit, the applicant provided a design for a combination of both an irrigation/re-use system as well as series of filtration basins, which will provide for a substantial amount of abstraction through a combination of decentralized infiltration, filtration, evapotranspiration and evaporation. While the alternative design would not achieve an amount of SEV control equivalent to the original approved design, the District Engineer finds that it would provide the greatest feasible level of SEV control. Also, since the time that permit #11-140 was considered, the District stormwater management rule was adjusted. Importantly, the proposed design meets the current stormwater rule standards for volume, rate, water quality, and prevention of downstream impacts (through measurement of SEV control). Therefore, the applicant has requested to revise the original stormwater management design associated with permit #11-140. The technical details of the filtration basins and irrigation/re-use system are outlined in the Stormwater Management section below.

The project will involve removal of existing forested area, installation of streets and associated utility connections, construction of a mix of 164 single-family homes and multi-unit townhome complexes, and implementation of wetland buffers, and permanent stormwater management features. The project triggers the District’s Erosion Control, Wetland Protection, and Stormwater Management rules, and is also regulated under the Wetland Conservation Act, for which, the City of Minnetrista is the local government unit responsible for administration. As noted, the project plans reflect a proposed revision of the stormwater management plan approved under Permit #11-140 in light of subsequent performance issues with constructed infiltration basins and additional geo-technical testing. The proposed stormwater management approach will not achieve the level of SEV control as did the approved plans under permit #11-140; however, as noted above, the applicant has demonstrated that the soil and groundwater conditions present in the location of the project are not conducive to infiltration, and therefore prohibit achieving the stormwater design

approved in 2011. The applicant has provided a stormwater management plan that meets the District's current Stormwater Management rule.

### **District Rule Analysis:**

#### Erosion Control Rule

The District's Erosion Control rule provisions were met through the approval of permit #11-140 by the Board of Managers. No amendment is sought for the plan as approved, therefore the information that follows serves as context for the overall proposal.

The District's Erosion Control Rule applies to projects proposing 5,000 square feet of disturbance or 50 cubic yards of fill, excavation, or stockpiling on-site. The Applicant is proposing 150 acres of disturbance, therefore the rule is triggered. In accordance with the rule provisions, the Applicant has submitted an erosion control plan which identifies erosion and sediment control best management practices. These include a rock construction entrance, silt fence down gradient of disturbed areas, concrete washout locations utilizing impermeable liners, a sedimentation basin, and inlet protection where necessary. Additionally, a vegetative stabilization plan including the incorporation of six-inches of topsoil into underlying soils prior to final stabilization has also been provided.

Submission of an NPDES permit and a Financial Assurance is listed as a recommended condition of approval. Upon satisfaction of the recommended condition, the project meets the Erosion Control Rule.

#### Wetland Conservation Act & Wetland Protection

The District's Wetland Protection rule provisions were met through the approval of permit #11-140 by the Board of Managers. No amendment is sought for the plan as approved, therefore the information that follows serves as context for the overall proposal.

The wetland boundary and types were delineated on October 3<sup>rd</sup> and October 6<sup>th</sup>, 2008 and approved by WSB & Associates on behalf of the City of Minnetrista on December 19, 2008 (Boundary and Type Notice of Decision (WSB Project No. 1741-17). There are .63 acres of existing wetland within the project boundaries with no proposed impacts.

#### *Wetland Protection*

The buffer provision of the Wetland Protection Rule is applicable whenever any of the Wetland Protection, Stormwater Management or Waterbody Crossings & Structures rules are triggered. Because the Stormwater Management rule is triggered, the buffer provision of the Wetland Protection rule is applicable.

There is one wetland on the northwestern side of the project. There is no work proposed within the wetlands.

Per section 5(a) of the Wetland Protection rule, buffers must be provided around all disturbed wetlands and on wetland edges downgradient of disturbance. The applicant provided plans demonstrating that buffers will be provided on all applicable wetland areas. Additional analysis on buffer width has been provided under section 6(c) below.

Per section 5(b) of the rule, buffers are required, and have been analyzed under section 6, below.

Per section 5(c) of the rule, buffers must be documented by a declaration or other recordable instrument. An executed maintenance declaration for Wetland Buffer Protection is listed as a condition of recommended approval. The maintenance agreement will list the applicable vegetation maintenance requirements and restrictions as outlined in section 7(a) and 7(b).

Section 5(d) of the rule requires a permanent wetland buffer monument to be installed at each lot line where it intersects the buffer, and where needed to indicate the contour of the buffer, with a maximum spacing of 100 feet. This requirement has been analyzed and satisfied under section 7(b) below, as the Applicant will be incorporating conforming monumentation and maintenance terms into the required recorded declaration.

Per section 6(a) of the rule, buffer width requirements are determined by the management class of the wetland. The District's Functional Assessment of Wetlands classifies the northwestern wetland as a Manage 2. Reductions in Applied Buffer Width per section 6(b) were not requested as part of this phase.

Per section 6(c) of the rule, buffer averaging is permitted should the full width of the buffer not be able to be provided in all locations. Under the provisions of the Board approval through permit #11-140, this phase of the overall Woodland Cove development proposed 0.74 acres of total buffer area. The current proposal conforms to the original approvals under permit 11-140.

Section 6(d) of the rule does not apply as the Applicant has not requested a reduction in Applied Buffer Width.

Section 6(e) of the rule does not apply as this is not a Linear Reconstruction Project.

Section 6(f) of this rule does not apply as this project is not a New Principal Residential Structure.

The applicant has submitted plans and specifications sufficient to show conformance with section 7(a) of the Wetland Protection rule, which prohibits actions such as mowing, fertilizing or placement of yard waste within the buffer area. The recorded declaration sets these protections in place.

Section 7(b) of the rule allows public land, homeowners associations, and right-of-way to comply with buffer monumentation, buffer monitoring, and vegetation management through a written maintenance agreement with the District. The Applicant's contractor, once selected, will complete the initial establishment of the vegetation, including two years of maintenance from date of installation to ensure viability. Following the establishment period, management is proposed to be completed by Minnesota Native Landscapes, in accordance with the Ecological Restoration & Open Space Landscaping & Management Plan, which was approved under permit #11-140. Maintenance of this project will also be covered under the applicant's wetland buffer declaration. Therefore, upon satisfaction of the recommended conditions, the Applicant meets the requirement of section 7(b) of the Wetland Protection rule.

Per section 7(c) of the rule, any buffer areas that will be disturbed by grading or other site activities during construction must be replanted and maintained according to the following standards:

- Soils must be decompacted to a depth of 18 inches and organic matter must be incorporated into soils before revegetation;

- Erosion/sediment control practices consistent with the requirements of the District Erosion Control rule must be employed during buffer establishment;
- Buffers shall be planted with a native seed mix and/or native plantings approved by the District; and
- Buffer maintenance and monitoring shall be performed and meet the standards of the District’s Wetland Buffer Monitoring requirements.

Review of the plans, specifications, and additional information the Applicant submitted showed the entirety of buffers around the northwestern wetland, and two wetland buffers located on the adjacent phase to the north will be reseeded and managed to details outlined in the Ecological Restoration & Open Space Landscaping Management Plan. The Applicant has provided information that sufficiently addresses the requirements, including specifications for decompaction of soils, submission of an erosion control plan, and native seed mix specifications. The Applicant meets the requirement of section 7(c) of the Wetland Protection rule.

In summary, the project meets the requirements of the Wetland Protection Rule as outlined in the 11-140 approval.

Stormwater Management Rule

As noted in the *Background* section, the applicant is proposing to amend the original 2011 Board approved stormwater management plan, as outlined in permit #11-140.

The Stormwater Management Rule is triggered whenever new impervious surface is proposed. The project proposes 43.66 acres of hard surface on the 153 acre project site. Under the approved stormwater management design associated with permit #11-140, the project would be required to achieve:

- Rate control, as outlined in Table 1; and,
- SEV control (the measurement used to quantify *Impacts on Downstream Waterbodies*, specifically bounce and inundation), as shown in Table 2, which shows a slight increase in the volume of water moving downstream for the 10-yr and 100-yr events. Because Lake Minnetonka is downstream, and has an extremely large capacity, the increases shown were demonstrated to have no impact to bounce or inundation.

Scenario	Rate (cfs)			
	Receiving Waterbody	1-yr	10-yr	100-yr
Existing (pre-build) Condition	To Stone Lake	4.0	42.1	97.2
Permit #11-140 Approval		1.2	12.1	31.0
Existing (pre-build) Condition	To Lake Minnetonka	2.6	32.5	80.7
Permit #11-140 Approval		2.7	24.9	64.9

Table 1: Rate Control Comparison - Existing Conditions to 11-140 Permit Approval

Scenario	Single-Event Volume (ac-ft)			
	Receiving Waterbody	1-yr	10-yr	100-yr
Existing (pre-build) Condition	To Stone Lake	1.2	6.2	13.3

Permit #11-140 Approval		0.2	4.4	13.1
Existing (pre-build) Condition	To Lake Minnetonka	1.4	8.0	18.6
Permit #11-140 Approval		0.9	6.9	18.6

*Table 2: Single-Event Volume Comparison - Existing Conditions to 11-140 Permit Approval*

Initially, under permit #11-140, a series of infiltration/ sedimentation basins was proposed in this phase to treat the impervious surface created through the single family homes and associated roads. However, poor post-construction performance of infiltration facilities in other phases of the Woodland Cove development prompted the Applicant to perform additional geo-technical testing to determine the appropriateness of an infiltration practice. Two separate instances of testing were conducted, the first in late February of 2019, and then a subsequent test in May of 2019. The initial testing in February of 2019 showed infiltration rates of near 0 in/hr and the presence of groundwater. Because these test results diverged significantly from the geo-technical testing submitted with the original permit in 2011, which showed surface infiltration rates of 1.1 in/hr., an additional test (May 2019) was conducted to understand, in additional detail, the discrepancy in results from the testing performed for the original permit #11-140 submittal and the February 2019 test.

The May 30, 2019 geo-technical testing consisted of two test pits, dug several feet below the bottom of the proposed infiltration area. Each test pit encountered low plasticity clay till soils at a depth of approximately two feet below the bottom of the proposed infiltration basin that were not conducive to infiltration. Additionally, at the interface between the topsoil and the clay till, groundwater seams were encountered. Both of the features found (clay soils and the seasonally high groundwater table within three feet of the bottom of an infiltration system) constitute design conditions that prohibit infiltration per the requirements outlined in Section 16 of the MPCA’s Construction Stormwater permit (CSW) and the Minnesota Stormwater Manual. These findings were verified by the District Engineer through observation of the geo-technical test performed in the field, and a review of the previous reports generated by the Applicant. Further, the District Engineer concluded that the conditions observed through the testing are most-likely indicative of geo-technical conditions throughout the site of the present proposed phase. This is based upon the level of saturation encountered in the clay till media, which indicates a high groundwater level is typical throughout this location.

Through the information submitted by the Applicant, staff and the District Engineer have determined that the geo-technical constraints demonstrated preclude infiltration. Therefore, in order to provide stormwater treatment under these geo-technical conditions, the Applicant proposes to utilize a stormwater irrigation/ re-use system and alteration of previously approved infiltration basins changed into filtration basins. The re-use system retains water in a pond reservoir, and through use of a specialized pump, moves retained stormwater through an irrigation piping network, utilizing the stormwater on available greenspace, as shown in Figure 3. The design of the irrigation system follows best engineering practices as outlined in the Minnesota Stormwater Manual and the District’s Stormwater Management rule. This includes submission of materials sufficient to demonstrate that:

- Sufficient pervious greenspace is available for irrigation;
- The stormwater re-use volume available in the reservoir pond both:
  - Below the primary outlet; and,

- Above the required dead pool of the pond, maintaining at least 4 feet of depth for water quality;
- The ability to pump and irrigate the pervious areas within a 48-hour period of a storm event.

The District Engineer has reviewed and determined that the above criteria have been met for the proposal.



Figure 3: Proposed Irrigable Greenspace

In examining alternative stormwater management practices, the Applicant submitted information including plans, calculations, and a narrative outlining that, with respect to all reasonable alternatives, meeting the performance standards of permit #11-140 is infeasible. Specifically, the applicant cited the single event volumes (SEVs) leaving the site under various storm events, due to poor soils and a regionally high groundwater table (Table 2). The Applicant has, based on the assessment and review of staff and the District Engineer, demonstrated that, due to the geo-technical conditions present, it is infeasible to meet the performance standards afforded by the stormwater designed associated with permit #11-140.

However, the proposed irrigation/re-use system and filtration basins strive to meet the performance standards of the design associated with permit #11-140 to the maximum extent feasible. Because of the shortfall from the original board decision under permit #11-140, the applicant is requesting an amendment to the stormwater management plan. In support of this request, the applicant has demonstrated that the proposed stormwater management plan will meet, and in several instances,



exceed, the District’s current Stormwater Management rule. A detailed, technical discussion of how each portion of the District’s current Stormwater Management rule is met can be found below. Staff and the District Engineer, based upon the information submitted, and considering the proposal meets the District’s current Stormwater Management standards, find the request to be reasonable.

Under the present stormwater rule, since the proposed site disturbance is greater than 40%, phosphorus, rate, and volume control must be provided for the entire site’s impervious surface, per section 5(c) of the rule, as shown in Table 1 below. The project proposes 43.66 acres of impervious surface (1,901,829 square feet).

Site Size	Site Disturbance	Impervious Surface Increase	Requirements	Treatment Scope
≤ 1 acre	N/A	N/A	Incorporate BMPs	N/A
> 1 acre	< 40% site disturbance	< 50% increase in impervious surface	Phosphorus Control, Rate Control, and Volume Control	Additional impervious surface
		≥ 50% increase in impervious surface		Entire site’s impervious surface
	≥ 40% site disturbance	N/A	Phosphorus Control, Rate Control, and Volume Control	Entire site’s impervious surface

Table 3: Stormwater Requirements for Redevelopment Resulting in an Increase in Impervious Surface

The technical findings of how the applicant’s proposal meets the District’s current Stormwater Management rule standards are outlined below.

*Volume Control*

The volume control requirement is met by abstracting the first inch of rainfall from all impervious surfaces. Based on the plans, stormwater calculations, and narrative the Applicant submitted, the required abstraction volume is 158,486 cubic feet under current District rules. The Applicant has provided an abstraction volume of 159,529 cubic feet, to be accomplished through an irrigation/re-use system and filtration basins (Table 4). As noted above, irrigation/re-use and filtration were selected as the primary methods of abstraction due to the underlying clay soils (hydrologic soil group D) and the presence of groundwater, which prohibit infiltration under Section 16 of the MPCA’s Construction Stormwater Permit and the guidance of the Minnesota Stormwater Manual.

Based on staff and the District Engineer’s analysis of the submittals provided by the Applicant, the provided abstraction volume is in excess of both the required abstraction through current District rules and through the permit #11-140 approval. Based on this review and analysis, the volume control requirement is met.

Scenario	Abstraction vol. (cf)
Permit #11-140	Not Quantified
Current Rules (1" x Impervious)	158,486
Proposed (irrigation/re-use)	159,529

Table 4: Abstraction Volume Comparison by Scenario

### Rate Control

The rate control requirement dictates that no net increase in the peak runoff rates for the 1-, 10-, and 100-year design storms may occur anywhere stormwater discharges across the downgradient site boundary. The Applicant has submitted plans, a stormwater model, stormwater calculations, and a narrative to demonstrate conformance with this criteria. A comparison of rates for the existing (pre-build), permit #11-140, and proposed (irrigation/re-use, filtration) conditions has been prepared by the Applicant to highlight anticipated rates, as shown in (Table 5). 65% of the site’s impervious surface is proposed to discharge to Lake Minnetonka, while 35% of the site is proposed to discharge to Stone Lake/ Lake Zumbra. Based on this analysis, staff and the District Engineer have determined the rate control requirement is met.

Receiving Waterbody	Rates (cfs)								
	1-year			10-year			100-year		
	Existing (Pre-build)	Permit Approval	Proposed	Existing (Pre-build)	Permit Approval	Proposed	Existing (Pre-build)	Permit Approval	Proposed
Stone Lake	4.0	1.2	3.9	42.1	12.1	15.7	97.2	37.5	31.0
Lake Minnetonka	2.6	2.7	2.2	32.5	24.9	19.6	80.7	64.9	51.9

Table 5: Rate Comparison by Scenario

### Phosphorus Control

Per section 3(a) of the Stormwater Management Rule, the phosphorus control requirement is met by meeting the abstraction requirements as outlined in the *Volume Control* section. Because the Applicant has demonstrated conformance with the volume control requirement, the phosphorus control requirement has been met.

### High Water Elevation

The high water elevation requirement of the rule requires two vertical feet of separation between the 100 year flood elevation and the low openings to structures. Based on the Applicant’s submittals, and review and analysis by staff and the District Engineer, there are multiple 100 year high water elevations associated with the reservoir ponds/ filtration basins, wetlands, and hydraulically connected drainage structures. In each case, the low opening to the proposed homes has demonstrated two-feet of vertical separation from proximate water features. Therefore the high water elevation requirement is met.

*Downstream Waterbodies*

The downstream waterbodies section of the rule regulates new point sources and changes to the bounce and period of inundation of water basins. This assessment is based upon an analysis of SEV control for storm events, which models the volume of water sent downstream and makes a determination as to the volume’s impact on the bounce or period of inundation of a waterbody. Based on the Applicant’s submittals, and review and analysis of the stormwater calculations, staff and the District Engineer have determined, in accordance with section 8 of the Stormwater Management Rule, that due to the large volume and capacity of the downstream waterbodies (Lake Minnetonka for drainage directed north, and Lake Zumbra/ Stone Lake for drainage directed south), bounce will not be measurable and the period of inundation will not be affected, even though the proposed irrigation/re-use system will increase volumes to Lake Minnetonka over the design approved under Permit #11-140 (Table 6). Therefore, the project as proposed meets this criterion of the present rule.

Receiving Waterbody	Volumes (ac-ft)								
	1-year			10-year			100-year		
	Existing (Pre-build)	Permit Approval	Proposed	Existing (Pre-build)	Permit Approval	Proposed	Existing (Pre-build)	Permit Approval	Proposed
Stone Lake	1.2	0.2	0.3	6.1	4.4	2.8	13.3	13.1	6.5
Lake Minnetonka	1.4	0.9	3.0	8.0	6.9	11.3	18.6	18.6	22.2

*Table 6: Single Storm Event Volume Comparison by Scenario*

The Applicant will be providing a financial assurance in accordance with Section 9 of the Stormwater Management Rule, the submittal of which is included as a condition of approval at the beginning of this report.

The Applicant will be providing a recorded declaration and maintenance agreement in conformance with Section 11 of the Stormwater Management Rule, the submittal of which is included as a condition of approval at the beginning of this report.

In summary, staff and the District Engineer have determined the project, subject to the conditions of approval as listed at the beginning of this report, meets all criteria of the Stormwater Management Rule.

**Summary:**

Woodland Cove LLC & M/I Homes LLC have applied for a Minnehaha Creek Watershed District permit amendment for the Erosion Control, Wetland Protection, and Stormwater Management rules for a proposed 164-lot subdivision in the City of Minnetrista. The proposed project seeks an amendment from the original stormwater management plan from the Woodland Cove subdivision approval under permit #11-140 due to geo-technical constraints. Based upon staff and the District Engineer’s review, the proposal meets the applicable requirements of current District rules upon satisfaction of the recommended conditions and approval by the Board of Managers. Therefore, staff recommends approval of the permit with the conditions listed.

**Supporting documents (list attachments):**

1. Water Resources Application Form
2. Proposed Drainage Map
3. Site Plans
4. Irrigation Plan
5. Geo-technical Report
6. Wetland Buffer Exhibit

WATER RESOURCE PERMIT APPLICATION FORM

Use this form to notify/apply to the Minnehaha Creek Watershed District (MCWD) of a proposed project or work which may fall within their jurisdiction. Fill out this form completely and submit with your site plan, maps, etc. to the MCWD at: 15320 Minnetonka Blvd. Minnetonka, MN 55345.

Keep a copy for your records.

YOU MUST OBTAIN ALL REQUIRED AUTHORIZATIONS BEFORE BEGINNING WORK.

1. Name of each property owner: Woodland Cove LLC and M/I Homes of Minneapolis/Paul LLC
Mailing Address: 301 Carlson Parkway #100 City: Minnetonka State: MN Zip: 55305
Email Address: cbecker@carlson-re.com/jrask@mihomes.com Phone: 952-404-5026 Fax:

2. Property Owner Representative Information (not required) (licensed contractor, architect, engineer, etc...)
Business Name: James R. Hill, Inc. Representative Name: Kurt Quaintance
Business Address: 2999 West County Road 42 #100 City: Burnsville State: MN Zip: 55306
Email Address: kquaintance@jrhinc.com Phone: (612) 508-8890 Fax:

3. Project Address: N/A City: Minnetrista
State: MN Zip: 55364 Qtr Section(s): SW/SE Section(s): 34 Township(s): 117 Range(s): 24
Lot: Block: Subdivision: PID: 3411724410003 and 34117244300

4. Size of project parcel (square feet or acres): 153.03 acres
Area of disturbance (square feet): 6,576,253.2 Volume of excavation/fill (cubic yards): 740,000
Area of existing impervious surface: 2.5 ac Area of proposed impervious surface: 43.66 ac
Length of shoreline affected (feet): Waterbody (& bay if applicable): Stone Lake/Sumbra-Sunny Lake/Lake

5. Type of permit being applied for (Check all that apply):
[X] EROSION CONTROL [ ] WATERBODY CROSSINGS/STRUCTURES
[ ] FLOODPLAIN ALTERATION [X] STORMWATER MANAGEMENT
[ ] WETLAND PROTECTION [ ] APPROPRIATIONS
[ ] DREDGING [ ] ILLICIT DISCHARGE
[ ] SHORELINE/STREAMBANK STABILIZATION

6. Project purpose (Check all that apply):
[ ] SINGLE FAMILY HOME [ ] MULTI FAMILY RESIDENTIAL (apartments)
[X] ROAD CONSTRUCTION [ ] COMMERCIAL or INSTITUTIONAL
[X] UTILITIES [X] SUBDIVISIONS (include number of lots)
[ ] DREDGING [X] LANDSCAPING (pools, berms, etc.)
[ ] SHORELINE/STREAMBANK STABILIZATION [ ] OTHER (DESCRIBE):

7. NPDES/SDS General Stormwater Permit Number (if applicable):

8. Waterbody receiving runoff from site: Lake Minnetonka

9. Project Timeline: Start Date: June 1, 2021 Completion Date: TBD

Permits have been applied for: City [X] County [X] MN Pollution Control Agency [ ] DNR [ ] COE [ ]
Permits have been received: City [ ] County [ ] MN Pollution Control Agency [ ] DNR [ ] COE [ ]

By signing below, I hereby request a permit to authorize the activities described herein. I certify that I am familiar with MCWD Rules and that the proposed activity will be conducted in compliance with these Rules. I am familiar with the information contained in this application and, to the best of my knowledge and belief, all information is true, complete and accurate. I understand that proceeding with work before all required authorizations are obtained may be subject to federal, state and/or local administrative, civil and/or criminal penalties.

Signature of Each Property Owner: [Handwritten Signature]

Date: 4/2/2021

Signature of Each Property Owner: [Handwritten Signature]

Date: 4/5/21



### PROPOSED DRAINAGE MAP

SCALE 1" = 300'

CAD FILE	22429-71SI-3
PROJECT NO.	22429-71
DATE	4/5/21
REVISIONS	
DRAWN BY	CLK
DATE	4/5/21
REVISIONS	
112	

**WOODLAND COVE 4TH & 5TH ADDITIONS**  
MINNETRISTA, MINNESOTA  
**SITE INFORMATION**  
FOR  
M/I HOMES OF MPIS/ST.PAUL, LLC THE MEADOWS AT HALSTEDS BAY, LLC

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.  
JAMES R. HILL, P.E.  
Date: 4/7/21 Reg. No.: 24676

**James R. Hill, Inc.**  
PLANNERS / ENGINEERS / SURVEYORS  
2999 W. Cty. Rd. 42, Suite 100, Burnsville, MN 55306  
PHONE: (952)890-6044 FAX: (952)890-6244







March 1, 2019

Project B1901739

Mr. Rick Packer  
Gonyea Homes  
1000 Boone Avenue North, Suite 400  
Golden Valley, MN 55427

Re: Results of Double-Ring Infiltrometer Testing  
Woodland Cove Pond Investigation  
Big Woods Drive  
Minnetrista, Minnesota

Dear Mr. Packer:

We are pleased to present the results of the requested double-ring infiltrometer (DRI) testing completed at the above referenced site in Minnetrista, Minnesota. We completed four tests in general accordance with ASTM International (ASTM) D 3385; *Standard Test Method for Infiltration Rate of Soils in Field Using a Double-Ring Infiltrometer*. The DRI testing was performed in the field by Braun Intertec personnel on February 22, 2019 at the approximate locations identified on the attached sketch. Excavations to reach test elevations were performed by an excavating subcontractor. The excavations were loosely backfilled with excavated spoils on February 25, 2019. Tests were performed to determine the relative infiltration rate of the in-situ soils.

The results of the DRI testing performed, including graphical representation, are attached to this report letter. Perched groundwater was observed seeping through the sidewalls of the excavation during the testing of DRI-3 and DRI-4. By the end of the test, ponding water was observed around the double-ring equipment. Due to the standing water observed during the first two tests, we decided to run the tests for DRI-1 and DRI-2 closer to the pond invert elevation with hopes that the water seeping through the sidewalls would be less. Initially there was no water seeping through the sidewalls but water did eventually start seeping through the sidewalls and these tests were also surrounded by standing water at the end of the test. Typically, this is the time of year when groundwater levels are the lowest due to frozen surface conditions. Based on the water flow observed and the recorded moisture contents (above probable optimum moisture content) it appears this is a wet area resulting in slow infiltration as shown by our infiltration test results.

Please note, soil infiltration rates will vary with soil moisture content, the introduction of fine-grained soils, topsoil, filter media, seasonal changes, compaction of the subgrade, or with changes in localized groundwater levels. This test does not constitute a review of the potential impacts, if any, from infiltration of large amounts of stormwater. We also note that topsoil, organics, filter media or compaction of the subgrade can limit the effectiveness of soil infiltration capability.

Soil samples were collected from the sidewalls of the excavations, near the bottom of the excavations. These samples were collected for laboratory testing including mechanical analyses, through a #200 sieve only, (ASTM C117) and moisture content tests (ASTM D2216).

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

We appreciate the opportunity to provide this testing service. If you have any questions or we can be of further assistance, please feel free to contact Erik Johnson at 952.995.2426 (ejohnson@braunintertec.com) at your convenience.

Sincerely,

BRAUN INTERTEC CORPORATION



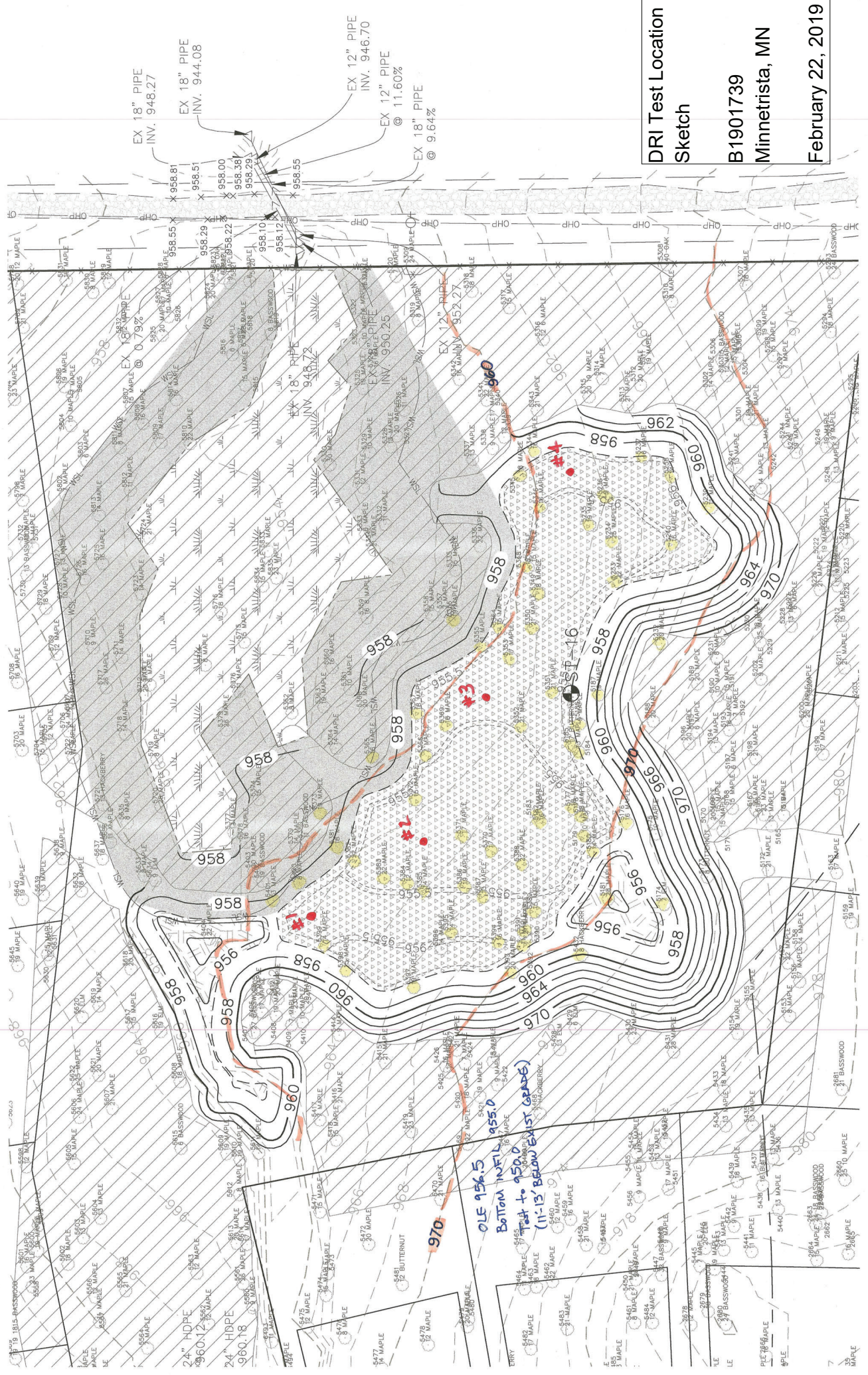
Erik C. Johnson, PE  
Associate Principal – Senior Engineer



Bradley J. McCarter, PE  
Principal – Senior Engineer

Attachments:

DRI Test Location Sketch  
DRI Test Results (4 pages)



EX 18" PIPE  
INV. 948.27

EX 18" PIPE  
INV. 944.08

EX 12" PIPE  
INV. 946.70

EX 12" PIPE  
@ 11.60%

EX 18" PIPE  
@ 9.64%

DRI Test Location  
Sketch  
B1901739  
Minnetrista, MN  
February 22, 2019

OLE 156.5  
Bottom INFLY 955.0  
Top to 950.0  
(11-13' BELOW EAST GRADE)

## Results of Double Ring Infiltrometer Testing (ASTM D 3385)- Mariotte Tube Method



Test Number:	DRI-1
Project Description:	Woodland Cove Pond
Project Number:	B1901739
Date:	February 22, 2019
Liquid used:	Potable water
Inner Ring Area:	113 square inches
Outer Ring Area:	452 square inches
Water depth Inner Ring (cm):	12.5
Water depth annular Ring (cm):	12.5
Weather:	Partly Sunny/23

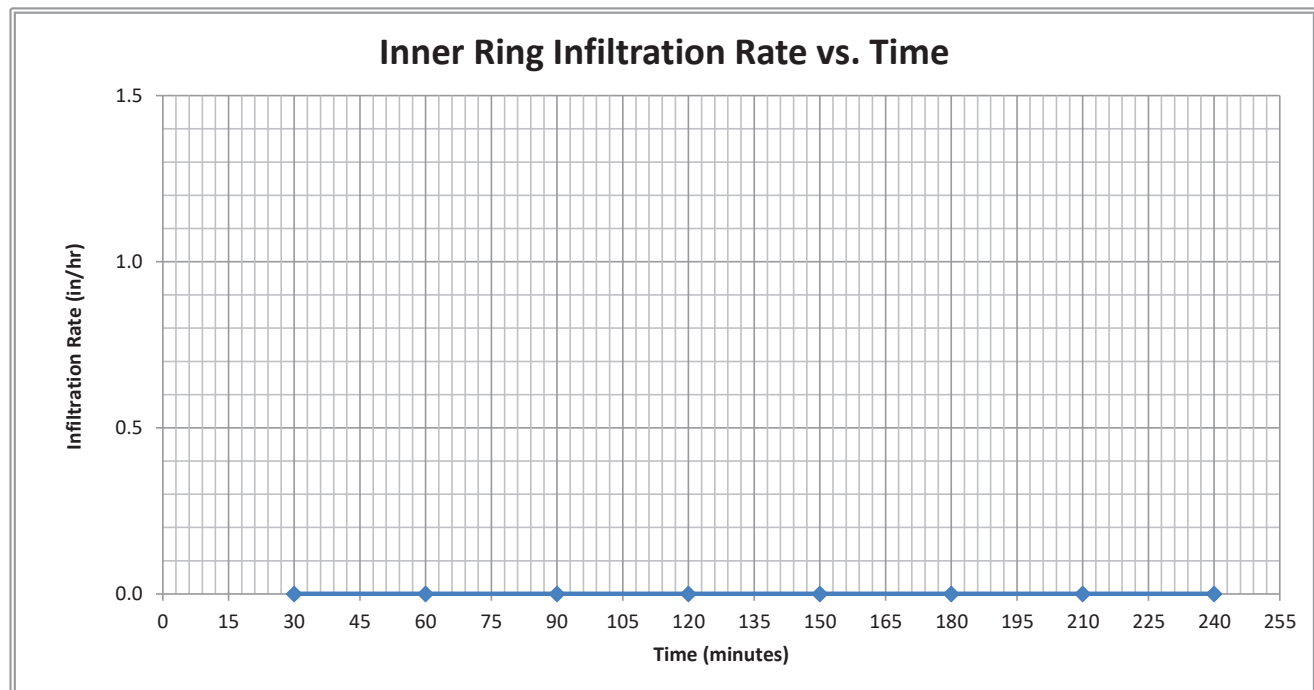
Test Location:	At stake
Test Elevation:	955
Ground Temperature °F:	44
Water Temperature °F:	34
Test performed by:	Matt Kluthe
Moisture Content of soil at test depth before test:	26%
Percent Fines passing a 200 sieve on soil at test depth:	59%

Time	Infiltration Rate (in/hr)
30	0.0
60	0.0
90	0.0
120	0.0
150	0.0
180	0.0
210	0.0
240	0.0

Depth below bottom of test	Soil Profile
0 to 3 feet	Sandy Lean Clay (CL), light brown to brown, moist to wet.
Groundwater depth	Seeping in through the excavation sidewalls during the test and ponding water was noted by the end of the test

<b>Average Infiltration Rate of Inner Ring Over Entire Test (in/hr)</b>	<b>0.0</b>
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<b>Steady State Infiltration Rate of Inner Ring Over Last 4 intervals (in/hr)</b>	<b>0.0</b>
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Test performed by Braun Intertec personnel in general accordance with test method ASTM D 3385.

# Results of Double Ring Infiltrometer Testing (ASTM D 3385)- Mariotte Tube Method



Test Number:	DRI-2
Project Description:	Woodland Cove Pond
Project Number:	B1901739
Date:	February 22, 2019
Liquid used:	Potable water
Inner Ring Area:	113 square inches
Outer Ring Area:	452 square inches
Water depth Inner Ring (cm):	12.5
Water depth annular Ring (cm):	12.5
Weather:	Partly Sunny/23

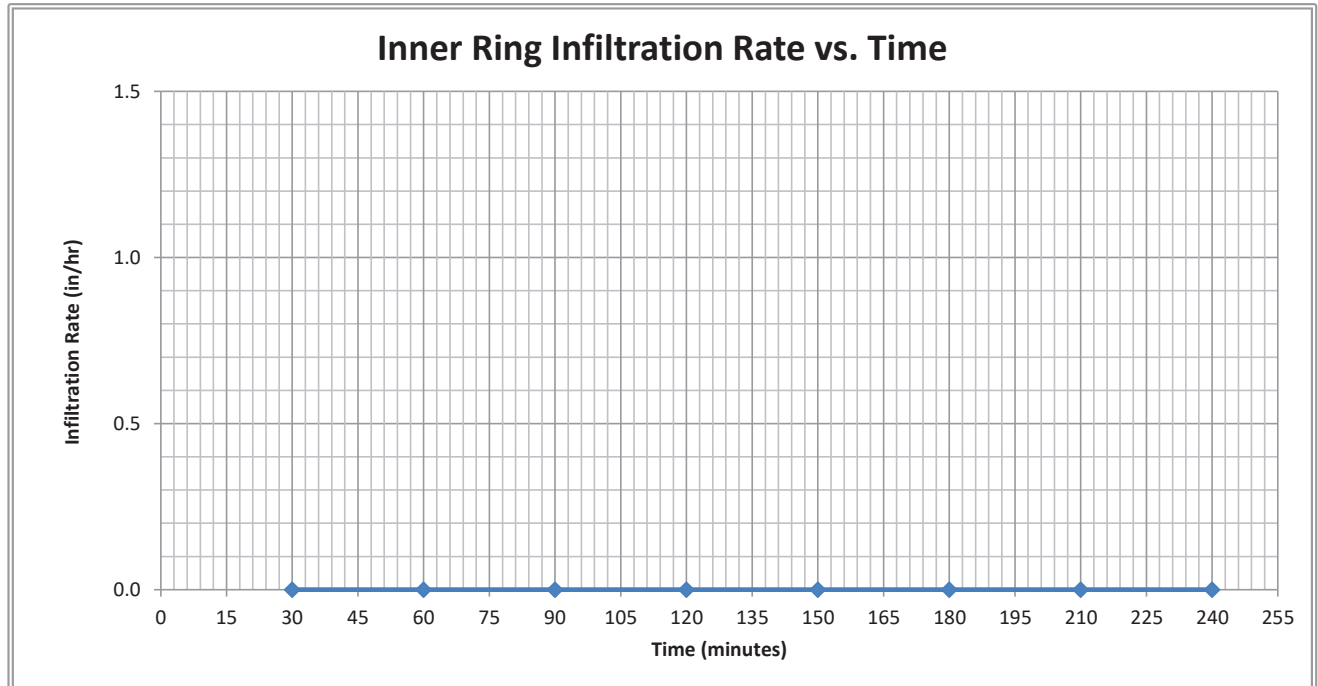
Test Location:	At stake
Test Elevation:	955
Ground Temperature °F:	45
Water Temperature °F:	34
Test performed by:	Matt Kluthe
Moisture Content of soil at test depth before test:	29%
Percent Fines passing a 200 sieve on soil at test depth:	76%

Time	Infiltration Rate (in/hr)
30	0.0
60	0.0
90	0.0
120	0.0
150	0.0
180	0.0
210	0.0
240	0.0

Depth below bottom of test	Soil Profile
0 to 3 feet	Sandy Lean Clay (CL), light brown to brown, moist to wet.
Groundwater depth	Seeping in through the sidewalls during the test and ponding water was noted by the end of the test

<b>Average Infiltration Rate of Inner Ring Over Entire Test (in/hr)</b>	<b>0.0</b>
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<b>Steady State Infiltration Rate of Inner Ring Over Last 4 intervals (in/hr)</b>	<b>0.0</b>
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## Results of Double Ring Infiltrometer Testing (ASTM D 3385)- Mariotte Tube Method



Test Number:	DRI-3
Project Description:	Woodland Cove Pond
Project Number:	B1901739
Date:	February 22, 2019
Liquid used:	Potable water
Inner Ring Area:	113 square inches
Outer Ring Area:	452 square inches
Water depth Inner Ring (cm):	12.5
Water depth annular Ring (cm):	12.5
Weather:	Overcast/15

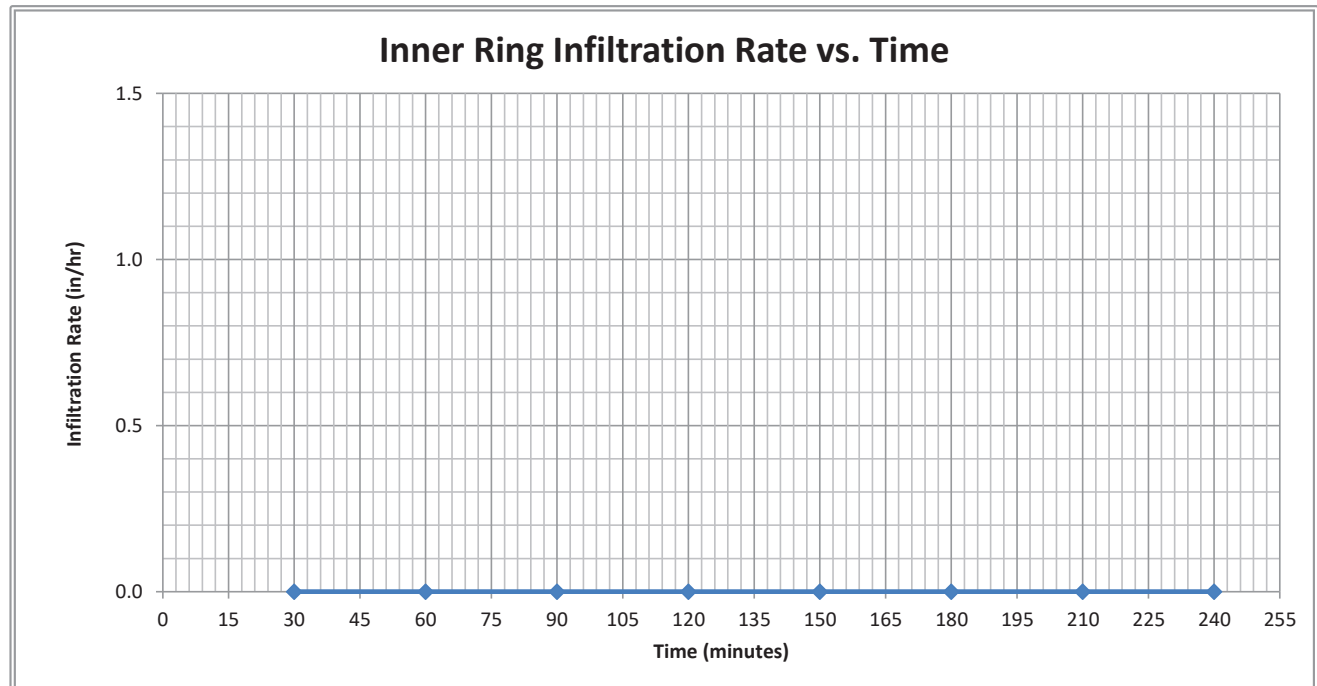
Test Location:	At stake
Test Elevation:	951
Ground Temperature °F:	44
Water Temperature °F:	35
Test performed by:	Matt Kluthe
Moisture Content of soil at test depth before test:	30%
Percent Fines passing a 200 sieve on soil at test depth:	78%

Time	Infiltration Rate (in/hr)
30	0.0
60	0.0
90	0.0
120	0.0
150	0.0
180	0.0
210	0.0
240	0.0

Depth below bottom of test	Soil Profile
0 to 3 feet	Sandy Lean Clay (CL), light brown to brown, moist to wet.
Groundwater depth	Seeping in through the sidewalls during the test and ponding water was noted by the end of the test

<b>Average Infiltration Rate of Inner Ring Over Entire Test (in/hr)</b>	<b>0.0</b>
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<b>Steady State Infiltration Rate of Inner Ring Over Last 4 intervals (in/hr)</b>	<b>0.0</b>
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# Results of Double Ring Infiltrometer Testing (ASTM D 3385)- Mariotte Tube Method



Test Number:	DRI-4
Project Description:	Woodland Cove Pond
Project Number:	B1901739
Date:	February 22, 2019
Liquid used:	Potable water
Inner Ring Area:	113 square inches
Outer Ring Area:	452 square inches
Water depth Inner Ring (cm):	12.5
Water depth annular Ring (cm):	12.5
Weather:	Overcast/15

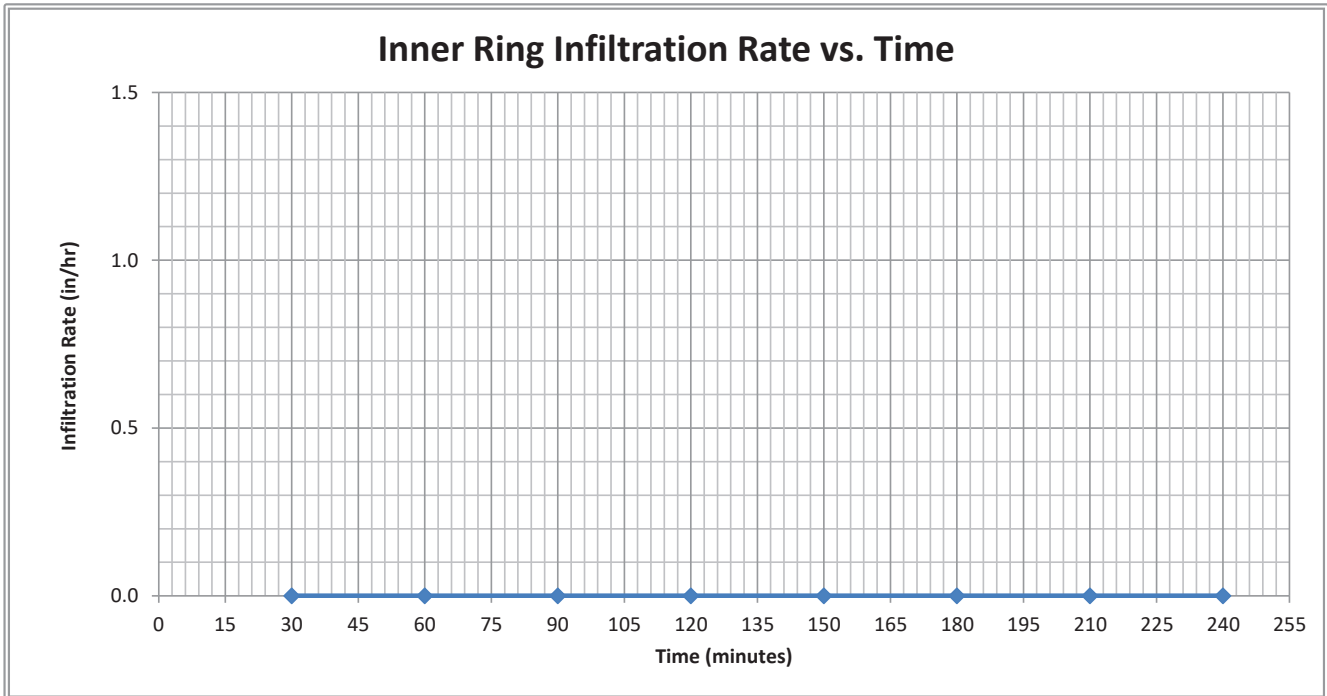
Test Location:	At stake
Test Elevation:	951
Ground Temperature °F:	43
Water Temperature °F:	35
Test performed by:	Matt Kluthe
Moisture Content of soil at test depth before test:	24%
Percent Fines passing a 200 sieve on soil at test depth:	60%

Time	Infiltration Rate (in/hr)
30	0.0
60	0.0
90	0.0
120	0.0
150	0.0
180	0.0
210	0.0
240	0.0

Depth below bottom of test	Soil Profile
0 to 3 feet	Sandy Lean Clay (CL), light brown to brown, moist to wet.
Groundwater depth	Seeping in through the sidewalls during the test and ponding water was noted by the end of the test

<b>Average Infiltration Rate of Inner Ring Over Entire Test (in/hr)</b>	<b>0.0</b>
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<b>Steady State Infiltration Rate of Inner Ring Over Last 4 intervals (in/hr)</b>	<b>0.0</b>
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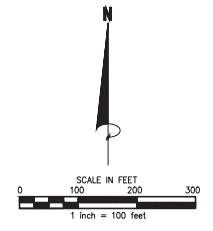


Test performed by Braun Intertec personnel in general accordance with test method ASTM D 3385.

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- EXISTING WETLAND BUFFER
  - PROPOSED WETLAND BUFFER
  - PROPOSED SEDIMENTATION BASINS
  - PROPOSED MCWD WETLAND BUFFER/OPEN SPACE SIGN LOCATION
- WETLAND SETBACK - 35 FEET**



**BENCHMARKS**  
 TOP NUT HYDRANT NORTHEAST QUADRANT OF THE INTERSECTION OF WOODLAND COVE BOULEVARD AND FOXGLOVE DRIVE. ELEVATION = 1052.06  
 TOP NUT HYDRANT NORTH SIDE OF WOODLAND COVE BOULEVARD 440' EAST OF INTERSECTION OF WOODLAND COVE BOULEVARD AND FOXGLOVE DRIVE. ELEVATION = 1055.55

**James R. Hill, Inc.**  
 PLANNERS / ENGINEERS / SURVEYORS  
 2999 W. Cty. Rd. 42, Site 100, Burnsville, MN 55306  
 PHONE: (952)890-6044 FAX: (952)890-6244

Energy Audit: This is not a registered professional seal. It is a design professional seal. State of Minnesota, P.E. License No. 22429-71MCD-24676

WOODLAND COVE 4TH & 5TH ADDITIONS  
 MCWD WETLAND BUFFER/OPEN SPACE SIGNS  
 FOR  
 W/1 HOMES OF WISCONSIN, LLC THE WARDMAN AT HALSTEDS BAY, LLC

DRAWN BY	CJK
DATE	5/4/21
REVISIONS	
CAD FILE	22429-71MCD
PROJECT NO.	22429-71
	1.1