



812.464.9585 office 812.464.2514 Fax  
4800 Rosebud Ln., Newburgh, IN 47630  
morleycorp.com

December 5, 2023

Vanderburgh County Surveyor  
Attn: Linda Freeman and Mike Ward  
1 NW Martin Luther King Jr. Blvd., Civic Center Complex – Room 325, Evansville, IN 47708

**Re: Drainage Variance Requests  
Green River Meadows – Section 2  
Morley Project No. 12103.4.001-B**

Dear Ms. Freeman,

On behalf of CWK Investments-Green River Park LLC, it is being requested that the drainage plans submitted 12/5/2023 be sufficient for drainage approval for the project noted above. The proposed project consists of a single-family detached residential subdivision, roadway, and utilities. Onsite retention has been proposed by the use of a proposed wet detention basin with a 12" discharge pipe as shown in the corresponding drainage plans.

According to Section 13.04.440 of the current Vanderburgh County Drainage Ordinance, wet basin cover vegetation is to be planted with turf equal to that of residential lawns. The proposed project also includes the dedication of a Wetland Preservation Easement as part of an issued Isolated Wetland Induvial Permit (#IWIP 2021-675-82-TMS-V) issued by IDEM on 4/28/2023. As part of the permit, land disturbance and tree clearing is to be minimized in order to maintain the area as in the existing condition. To lesson environmental impacts in the vicinity of the wetland to be preserved, the proposed wet retention basin banks are proposed to be planted with native grasses and wildflowers, for which a variance is being sought.

Also according to Section 13.04.440 of the current Vanderburgh County Drainage Ordinance, wet basins are also required to have a 10' maintenance pathway around the basin. A second variance is being requested to allow for the proposed top of bank of the basin to be a minimum width of 6' to allow for the maximum storage footprint while maintaining the proposed Wetland Preservation Easement previously mentioned.

Please refer to the current submitted drainage plans and drainage report for more information. If you should have any questions or need further information, please contact our office as soon as possible.

Sincerely,

James E Morley, PE, PS



12-5-2023

cc : File

J:\12000s\12100-12199\12103\Civil 3D\Documents\Outgoing\2023.12.05 - Follow Up VC Eng and Surv Resubmission\Components\12103 - Drainage Letter.doc

12/5/23

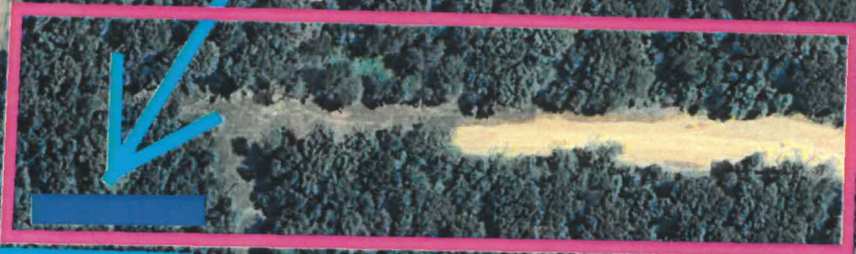
12103

Legend

Q10 = 12.21 cfs before project

Q100 = 5.97 cfs after project

This project puts less water in the receiving rear yard swale than currently goes to there. This project will decrease the flow from this area in the swale by over 50%



Google Earth

Image © 2023 Airbus



1000 ft

## Letter of Transmittal

**Regarding:** Final Drainage  
Green River Meadows  
Section 2

**To:** Linda Freeman  
Vanderburgh County Surveyor  
Civic Center Complex-Room 325  
Evansville, IN 47708

**Project No:** 12103.4.001-B

**Date:** December 5, 2023

We are sending you by: **Messenger**

We are sending:

COPIES	DOC. DATE	DESCRIPTION
1	12/5/2023	Revised Drainage Report Sheets
1	12/5/2023	Revised Road and Drainage Plan/Details
1	12/5/2023	Drainage Variance Request Letter

**These are transmitted: For Approval** Choose an item.

**Remarks:**

Please call if you have any questions.

**Copies to:** FILE

**Signed:**



Kevin Lasher, EI



# MORLEY

ARCHITECTS | ENGINEERS | SURVEYORS

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Sincerely,

James E Morley, PE, PS



12-5-2023

**APPROVED**

DEC 05 2023

VANDERBURGH COUNTY  
DRAINAGE BOARD

cc : File



**MORLEY  
FORM 800**

PROJECT: **Green River Meadows - Section 2** DETENTION FACILITY DESIGN RETURN PERIOD: 100 YRS

DESIGNER: **JEM** 12103.4.001-B RELEASE RATE RETURN PERIOD: 10 YRS

UNDEVELOPED WATERSHED AREA (Au)	11.03	ACRES
TIME OF CONCENTRATION (UNDEVELOPED WATERSHED)	25.0	MINUTES
RAINFALL INTENSITY (Iu):	3.24	INCHES/HR
UNDEVELOPED RUNOFF COEFFICIENT (Cu):	0.18	
UNDEVELOPED RUNOFF RATE (Q = Cu*Iu*A):	6.37	CFS
DEVELOPED WATERSHED AREA (Ad) - contributing to basin	10.10	ACRES
DEVELOPED RUNOFF COEFFICIENT (Cd):	0.48	

ALLOWABLE OFFSITE PASS THROUGH RATE (Offsite Sub-basins 2 & 3)	8.72	CFS
DEVELOPED UNDETAINED RELEASE RATE	0.60	CFS
ALLOWABLE PIPE RELEASE RATE	14.49	CFS
ACTUAL DISCHARGE PIPE OUTFLOW	5.37	CFS

STORM DURATION Td (HRS)	RAINFALL INTENSITY Id (INCH/HR)	INFLOW RATE I(Td) (Cd*Id*Ad) (CFS)	OUTFLOW RATE Q (actual) (CFS)	STORAGE RATE I(Td)-Q (CFS)	REQUIRED STORAGE ((I(Td)-Q)*Td/12) (ACRE.FT)			
0.08	9.951	48.24	5.37	42.87	0.30			
0.17	8.053	39.04	5.37	33.67	0.46			
0.25	6.677	32.37	5.37	27.00	0.56			
0.50	4.214	20.43	5.37	15.06	0.62			
0.67	3.289	15.94	5.37	10.57	0.58			
0.75	2.943	14.27	5.37	8.90	0.55			
1.00	2.560	12.41	5.37	7.04	0.58			
1.50	2.252	10.92	5.37	5.55	0.69			
2.00	1.844	8.94	5.37	3.57	0.59			
2.50	1.571	7.61	5.37	2.24	0.46			
3.00	1.374	6.66	5.37	1.29	0.32			
4.00	1.107	5.37	5.37	0.00	0.00			
5.00	0.933	4.53	5.37	-0.84	-0.35			
6.00	0.811	3.93	5.37	-1.44	-0.71			
7.00	0.719	3.49	5.37	-1.88	-1.09			
8.00	0.648	3.14	5.37	-2.23	-1.47			
9.00	0.590	2.86	5.37	-2.51	-1.87			
10.00	0.543	2.63	5.37	-2.74	-2.26			

PEAK STORAGE (ACRE-FT)	0.69
PEAK STORAGE (CUBIC FT)	29,950

**APPROVED**

DEC 05 2023

VANDERBURGH COUNTY  
DRAINAGE BOARD

**BASIN DISCHARGE**

**Pipe Flow:** 
$$Q = A_p \left( \frac{h_p}{\frac{K_e + K_o}{2g} + \frac{2.87n^2L}{D^{4/3}}} \right)^{1/2} \quad (\text{LTAP 6.3.5})$$

Pipe Dia.	12	(inch)
Ap (s.f.)	0.79	Area of Pipe
n	0.012	Manning roughness coef.
g (f/s <sup>2</sup> )	32.2	Acceleration due to gravity
H (ft)	2.15	Head at invert
h <sub>p</sub> (ft)	1.65	Head at center of pipe
L (ft)	16	Length of pipe
K <sub>e</sub>	0.85	Entrance Loss
K <sub>o</sub>	1.00	Outlet Loss
 Q=	 5.37	 CFS

**STAGE STORAGE VOLUME**

Stage	Surface Area (S.F.)	Cum. Storage Vol. (C.F.)	Notes
388.05	11,370		Normal Pool
389.30	14,670	16,275	25 Year Water Elev.
389.90	17,200	25,836	
390.20	32,300	33,261	100 Year Water Elev.
390.30	34,200	36,586	EO FL

Available Storage:	33,261	0.76	AC-FT
Required Storage:	29,950	0.69	AC-FT
	90%		Basin Capacity

**APPROVED**

DEC 05 2023

VANDERBURGH COUNTY  
DRAINAGE BOARD

**MORLEY**  
**FORM 800 (Emergency Overflow)**

PROJECT: **Green River Meadows - Section 2** DETENTION FACILITY DESIGN RETURN PERIOD: **100** YRS

DESIGNER: **JEM** 12103.4.001-B RELEASE RATE RETURN PERIOD: **10** YRS

UNDEVELOPED WATERSHED AREA (Au)		ACRES
TIME OF CONCENTRATION (UNDEVELOPED WATERSHED)		MINUTES
RAINFALL INTENSITY (Iu):		INCHES/HR
UNDEVELOPED RUNOFF COEFFICIENT (Cu):		
UNDEVELOPED RUNOFF RATE (Q = Cu*Iu*A):		CFS
DEVELOPED WATERSHED AREA (Ad) - contributing to basin	15.80	ACRES
DEVELOPED RUNOFF COEFFICIENT (Cd):	0.40	
DEVELOPED UNDETAINED RELEASE RATE		CFS
ALLOWABLE PIPE RELEASE RATE	0.00	CFS
ACTUAL DISCHARGE PIPE OUTFLOW	0.00	CFS

STORM DURATION Td (HRS)	RAINFALL INTENSITY Iu (INCH/HR)	INFLOW RATE I(Td) (Cd*Iu*Ad) (CFS)	OUTFLOW RATE Q (actual) (CFS)	STORAGE RATE I(Td)-Q (CFS)	REQUIRED STORAGE ((I(Td)-Q)*Td)/12 (ACRE.FT)			
0.08	9.951	62.56	0.00	62.56	0.43			
0.17	7.990	50.23	0.00	50.23	0.71			
0.25	6.677	41.98	0.00	41.98	0.87			
0.50	4.214	26.49	0.00	26.49	1.09			
0.67	3.289	20.67	0.00	20.67	1.14			
0.75	2.943	18.50	0.00	18.50	1.15			
1.00	2.560	16.09	0.00	16.09	1.33			
<b>1.50</b>	<b>2.252</b>	<b>14.16</b>	<b>0.00</b>	<b>14.16</b>	<b>1.75</b>			
2.00	1.844	11.59	0.00	11.59	1.92			
2.50	1.571	9.87	0.00	9.87	2.04			
3.00	1.374	8.64	0.00	8.64	2.14			
4.00	1.107	6.96	0.00	6.96	2.30			
5.00	0.933	5.87	0.00	5.87	2.42			
6.00	0.811	5.10	0.00	5.10	2.53			
7.00	0.719	4.52	0.00	4.52	2.61			
8.00	0.648	4.07	0.00	4.07	2.69			
9.00	0.590	3.71	0.00	3.71	2.76			
10.00	0.543	3.41	0.00	3.41	2.82			

APPROVED

DEC. 05 2023

VANDERBURGH COUNTY  
DRAINAGE BOARD

# Weir Report

## Emergency OverFlow Report

### Trapezoidal Weir

Crest = Sharp  
Bottom Length (ft) = 28.00  
Total Depth (ft) = 0.83  
Side Slope (z:1) = 4.00

### Highlighted

Depth (ft) = 0.33  
Q (cfs) = 14.16  
Area (sqft) = 9.68  
Velocity (ft/s) = 1.46  
Top Width (ft) = 30.64

### Calculations

Weir Coeff. Cw = 2.60  
Compute by: Known Q  
Known Q (cfs) = 14.16

**Q(100) = 14.16 CFS**

