Mallard, Inc.

QUARTERLY WATER SAMPLING REPORT
CITY OF DUNEDIN
MUNICIPAL SERVICES FACILITY
750 MILWAUKEE AVENUE
DUNEDIN, FLORIDA

JANUARY 13, 2011

Mallard, Inc.

3296 Main Street
Cottondale, Florida 32431
(850) 352-2299 • Fax (850) 352-2239

10801 N. Newport Avenue
Tampa, Florida 33612
(813) 935-2073 • Fax (813) 935-3106

January 13, 2011

Mr. Kevin Bagnall
K.B. Industries, Inc.
28100 U.S. Highway 19 North
Suite 410
Clearwater, Florida 33761

RE: Fourth Quarter Water Sampling Activities at the City of Dunedin Municipal Services Facility, 750 Milwaukee Avenue, Dunedin, Florida.

Dear Mr. Bagnall:

Mallard, Inc. (Mallard) has recently completed quarterly water sampling activities for the referenced project. This report summarizes the results for the activities conducted with the KBI Industries Flexi-Pave product.

Project Understanding

Mallard is of the understanding that KBI is interested in determining how the nitrate and phosphorous loads in surface water would be affected subsequent to percolation through the Flexi-Pave product into the underlying groundwater. The Flexi-Pave product is a porous material that contains interstitial pore spaces that allow for the percolation of water and the accumulation and growth of bacteria. The objective of this experiment was to determine what, if any, reductions in nitrate and phosphorous concentrations result from the use of the Flexi-Pave product.

Field Activities

Two new load-bearing parking spaces were installed using the Flexi-Pave product at the Municipal Services Building in Dunedin, Florida. Immediately prior to the Flexi-Pave product being installed, Mallard installed a total of four permanent water-capture systems at different locations along the edge of the parking spaces. The water-capture system locations are indicated on the attached map. A pvc pipe was installed at an approximate 45 degree angle to insure the piping would access the water-capture basin located immediately beneath the Flexi-Pave product and sub-base materials, but above the existing water table. A schematic of the water-capture system is attached. Specifically, the water-capture systems consist of a 2-foot long sch 40 pvc pipe that is 12" in diameter and capped only at the bottom. The open end of the pipe faces upward and the pipe was filled with coarse sand to facilitate capture and temporary retention of water. Holes were drilled in the bottom cap of the pipe to allow for drainage. A 1" diameter pvc pipe with a one-foot section of screen (0.01" slot) was placed inside the sand-filled pipe at an angle. The 1" pipe was placed inside a 2" diameter protective casing up to land surface. The top of the 1" diameter pipe was accessed at ground level from within a 12" x 17" flush-mounted sprinkler box. The water-capture systems were installed manually by Mallard personnel. Upon initial water testing through the Flexi-Pave product and into the water-capture systems, it was determined that quicker percolation rates could be achieved by replacing the coarse sand in the pvc cylinder with 57# rock material, and extending the cylinder up to the approximate bottom of the Flexi-Pave product to eliminate fluid loss from horizontal flow through the sub-base.

Two water-capture systems (WCS-1 and WCS-2) were installed beneath a section of the parking space with a stabilized load bearing sub-base, and capped with the Flexi-Pave product. WCS-1 was used as a control system. The third system (WCS-3) was installed beneath a section of the parking space with a water treatment residual (WTR) in place, then followed by the stabilized load bearing sub-base, and then the Flexi-Pave product. The fourth system (WCS-4) was installed beneath a section of the parking space that has a WTR in place on top of a thin textile material layer, followed by the stabilized load bearing sub-base, and then the Flexi-Pave product. Individual schematics for each water-capture system are attached. The use of a stabilized load-bearing sub-base capped by the two inches of Flexi-Pave is the standard application protocol for a load-bearing parking lot. The water-capture systems were installed beneath these three different sections of the parking spaces to test the ability of the Flexi-Pave product to reduce the concentrations of nitrates and phosphorous found in surface water flows.

On December 21, 2010, Mallard collected a set of water samples from three of the four systems for analysis (WCS-1, WCS-3 and WCS-4). Mallard poured known concentration standards of Nitrogen (2.4 mg/L) and Total Phosphorous (19 mg/L) onto the Flexi-Pave surface above each water-capture system and allowed it to percolate through into the system. The water samples collected were tested for nitrates by EPA Method 353.2 and total phosphorous by EPA Method 365.4. The samples were tested by a state certified analytical laboratory. The results of these samples were used to determine what the sub-base materials contribute to the phosphorous and nitrate concentrations (if any). The results of the water samples are summarized on Table 1. The results for nitrates indicate that nitrate was detected at concentrations of 0.40 mg/L, 0.51 mg/L and 1.9 mg/L at locations WCS-1, WCS-3 and WCS-4, respectively. The nitrate standard used was 2.4 mg/L. This data indicates an 83% reduction in nitrate concentration at WCS-1, a 79% reduction in nitrate concentration at WCS-3 and a 21% reduction in nitrate concentration at WCS-4 subsequent to the nitrate standard percolating through the flexi-pave materials.

The results for total phosphorous indicate that total phosphorous was detected at concentrations of 2.3 mg/L, 1.4 mg/L and 3.7 mg/L at locations WCS-1, WCS-3 and WCS-4, respectively. The total phosphorous standard used was 19 mg/L. This data indicates an 88% reduction in phosphorous concentration at WCS-1, a 92.6% reduction in phosphorous concentration at WCS-3 and an 81% reduction in phosphorous concentration at WCS-4 subsequent to the total phosphorous standard percolating through the flexi-pave materials.

These results also indicate a decrease in nitrate and total phosphorous concentrations since March 3, 2010, when samples were also collected from WCS-1, WCS-3 and WCS-4 using known nitrate (2.4 mg/L) and total phosphorous (20 mg/L) standards (Table 1).

These results indicate what impacts each variation of the Flexi-Pave product has on nitrates and total phosphorous prior to reaching the groundwater table. These results indicate that the Flexi-Pave product is effective in reducing nitrate loads to the groundwater table over time in the differently constructed sub-bases for WCS-1 (standard construction) and WCS-3 (WTR). However, the construction of WCS-4 (WTR plus textile layer) does not appear to have any significant influence in reducing nitrate loads over time. This is based on the nitrate concentrations showing a 66% reduction in March, 2010, but only a 21% reduction in December 2010.

The Flexi-Pave product appears to be effective in reducing the total phosphorous loads to the groundwater over time at each of the WCS-1, WCS-3 and WCS-4 sample locations. This is based on the total phosphorous concentrations showing a 30% to 35% reduction in March, 2010, and 88%, 92.6% and 81% reductions, respectively, in December 2010.

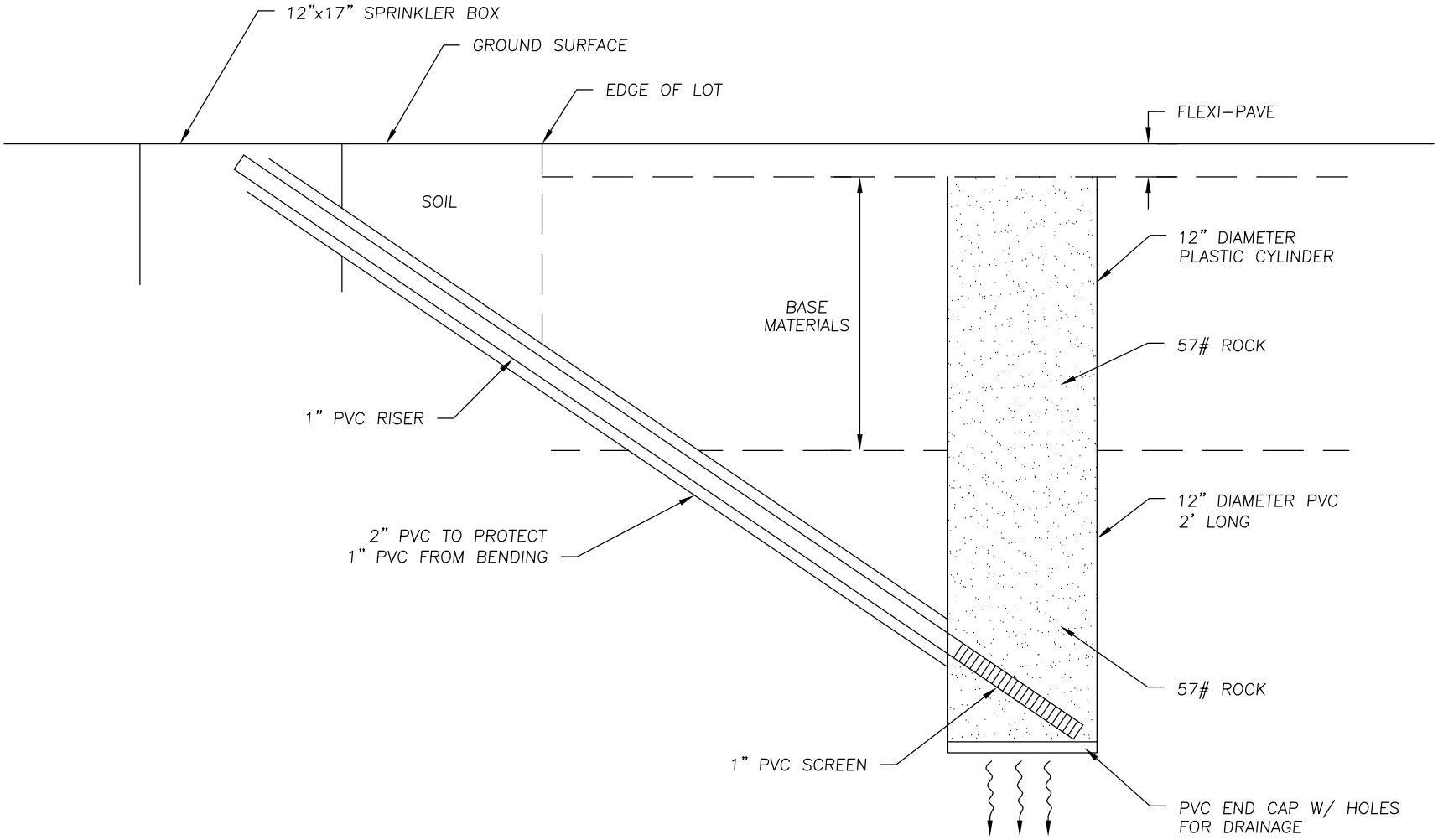
Should you have any questions concerning this report, please do not hesitate to contact me at (813) 935-2073.

Sincerely,
Mallard, Inc.

Maura Clark 1/13/11

Maura Clark, P.G.
Vice President
Florida License No. 1621

FIGURES

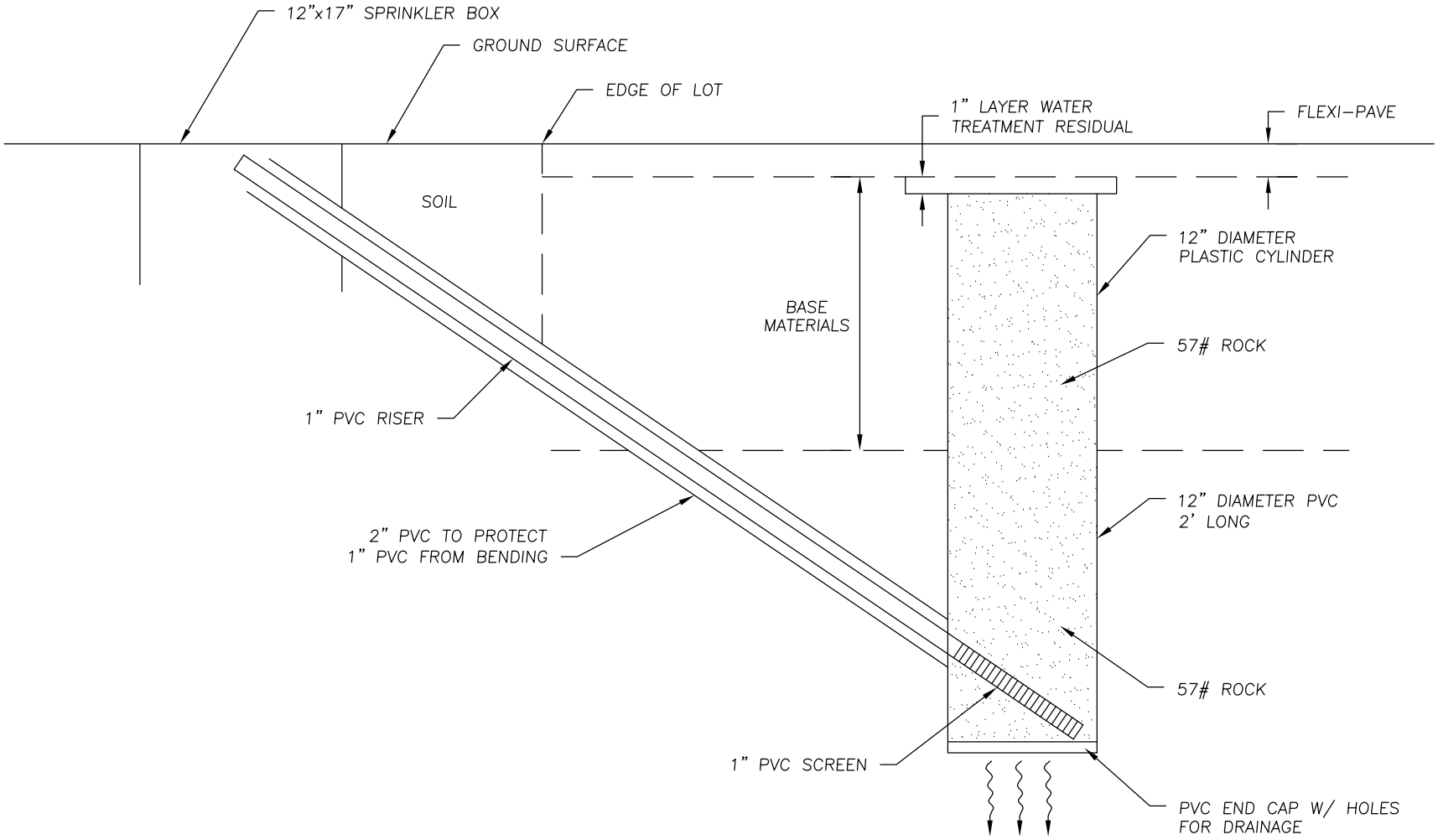


NOT TO SCALE

Mallard, Inc.

WATER CAPTURE SYSTEM #1, #2

DUNEDIN\WCS1 3–24–10

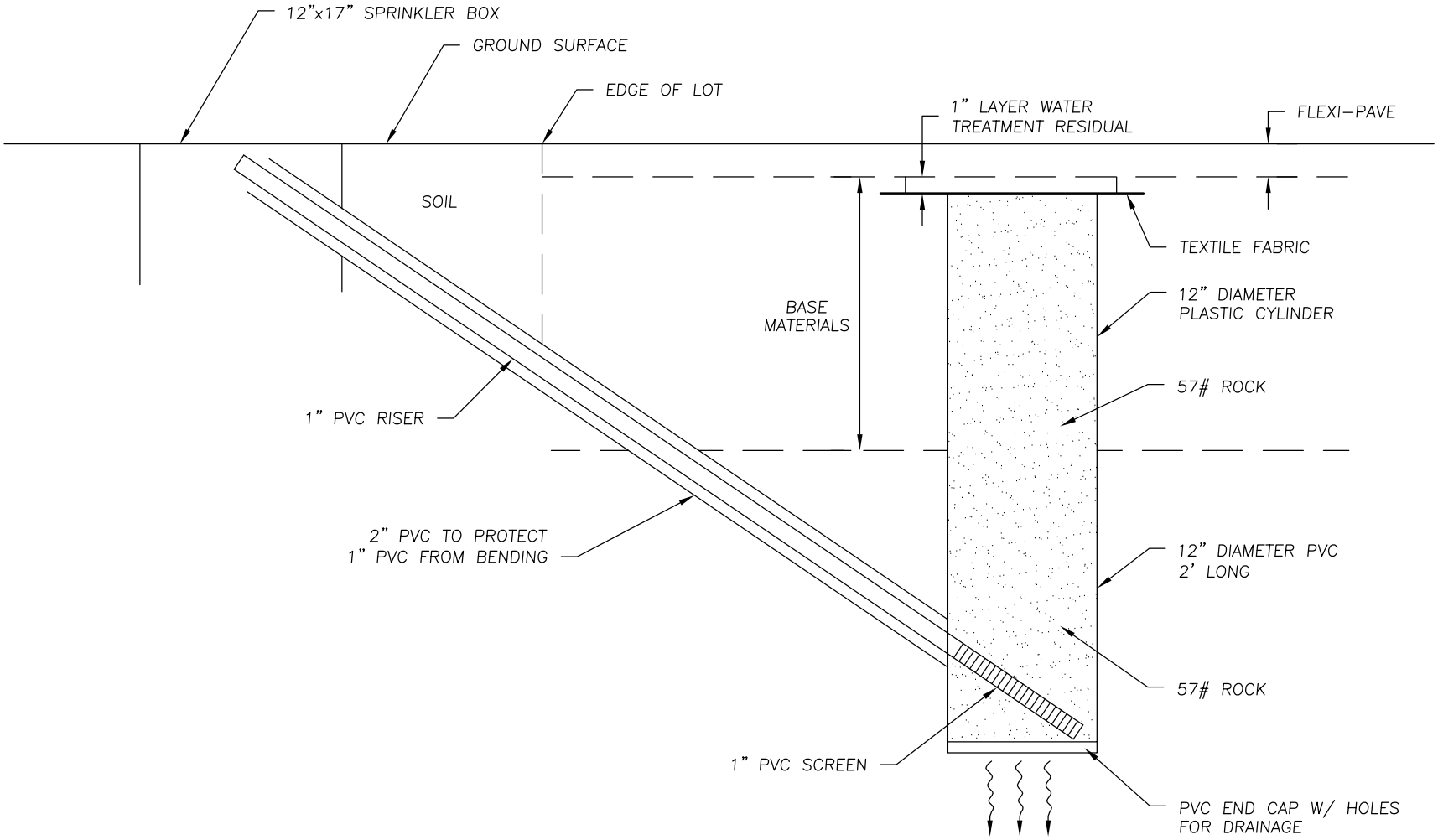


NOT TO SCALE

Mallard, Inc.

WATER CAPTURE SYSTEM #3

DUNEDIN\WCS3 3–24–10

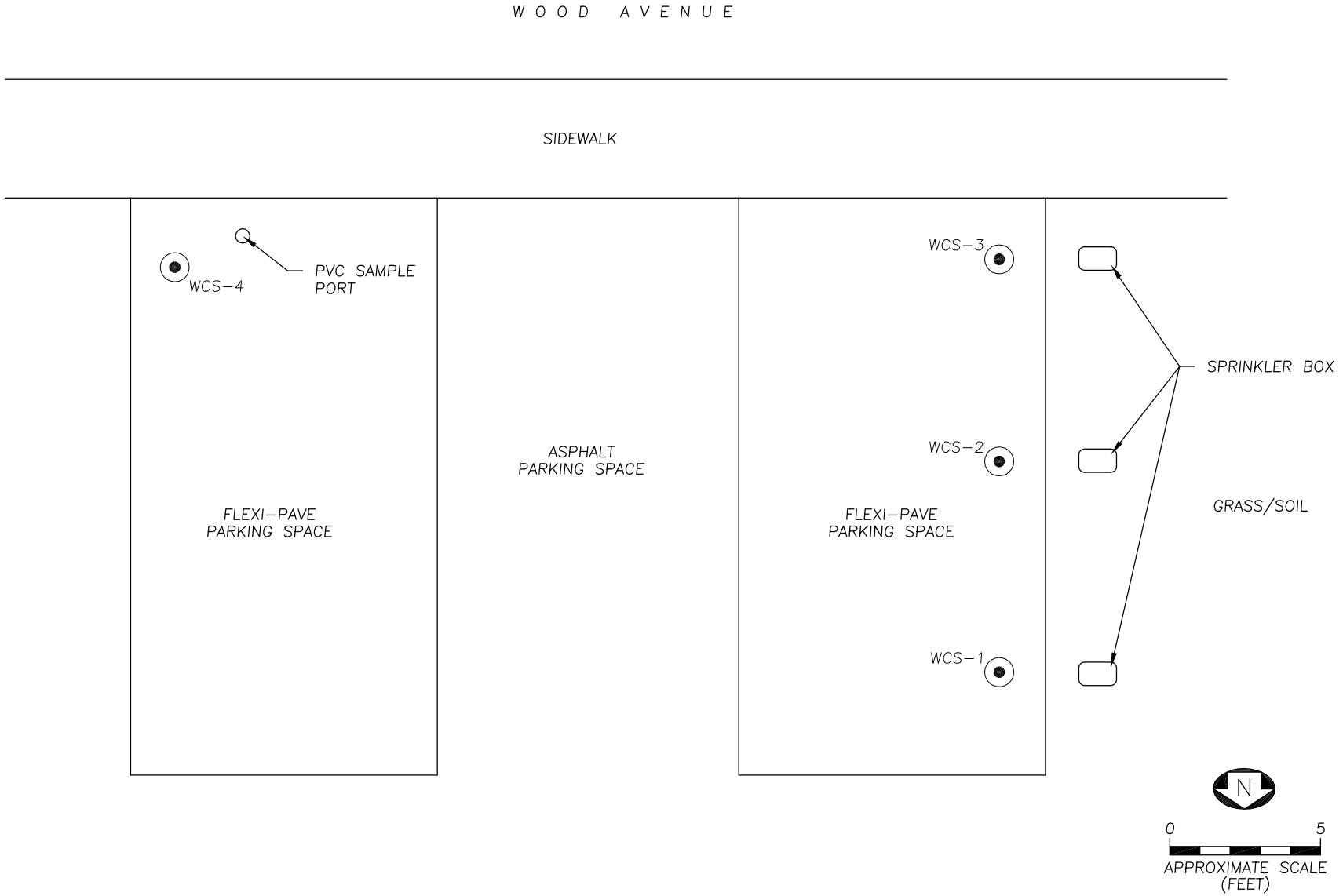


NOT TO SCALE

Mallard, Inc.

WATER CAPTURE SYSTEM #4

DUNEDIN\WCS4 3–24–10



Mallard, Inc.

WATER CAPTURE SYSTEM LOCATION MAP
DUNEDIN, FLORIDA

DUNEDIN\SYSTEM 3–24–10

LABORATORY DATA REPORT

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 660-38920-1

Job Description: Dunedin Public Works

For:
Mallard, Inc.
10801 N. Newport Avenue
Tampa, FL 33612

Attention: Maura Clark

Approved for release.
Amy Atkins
Project Manager I
12/30/2010 11:43 AM

Amy Atkins
Project Manager I
amy.atkins@testamericainc.com
12/30/2010

Methods: FDEP, DOH Certification #: Tampa E84282. These test results meet all the requirements of NELAC unless specified in the case narrative. All questions regarding this test report should be directed to the TestAmerica Project Manager who signed this test report. The estimated uncertainty associated with these reported results is available upon request. The results contained in this test report relate only to these samples included herein.

Job Narrative
660-38920-1

Receipt
All samples were received in good condition within temperature requirements.

General Chemistry
Method 365.4: The matrix spike(MS) recovery for batch 104653 was outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

EXECUTIVE SUMMARY - Detections

Client: Mallard, Inc. Job Number: 660-38920-1

Lab Sample ID / Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
660-38920-1	**WCS-1**					
Nitrate as N		0.40	I	0.50	mg/L	353.2
Phosphorus, Total		2.3		0.30	mg/L	365.4
660-38920-2	**WCS-3**					
Nitrate as N		0.51		0.50	mg/L	353.2
Phosphorus, Total		1.4		0.30	mg/L	365.4
660-38920-3	**WCS-4**					
Nitrate as N		1.9		0.50	mg/L	353.2
Phosphorus, Total		3.7		0.30	mg/L	365.4

METHOD SUMMARY

Client: Mallard, Inc. Job Number: 660-38920-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Nitrogen, Nitrate-Nitrite	TAL TAM	MCAWW 353.2	
Phosphorus, Total	TAL TAM	EPA 365.4	
Phosphorus, Total	TAL TAM		MCAWW 365.2/365.3/365

Lab References:

TAL TAM = TestAmerica Tampa

Method References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

METHOD / ANALYST SUMMARY

Client: Mallard, Inc. Job Number: 660-38920-1

Method	Analyst	Analyst ID
MCAWW 353.2	Sengsouvanna, Dom	DS
EPA 365.4	Office, Trey	TO

SAMPLE SUMMARY

Client: Mallard, Inc. Job Number: 660-38920-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
660-38920-1	WCS-1	Water	12/21/2010 1157	12/21/2010 1400
660-38920-2	WCS-3	Water	12/21/2010 1253	12/21/2010 1400
660-38920-3	WCS-4	Water	12/21/2010 1206	12/21/2010 1400

General Chemistry

Client Sample ID: **WCS-1**

Lab Sample ID: 660-38920-1 Date Sampled: 12/21/2010 1157

Client Matrix: Water Date Received: 12/21/2010 1400

Analyte	Result	Qual	Units	MDL	PQL	Dil	Method
Nitrate as N	0.40	I	mg/L	0.10	0.50	1.0	353.2
Analysis Batch: 660-104481	Date Analyzed: 12/21/2010 1900						
Phosphorus, Total	2.3		mg/L	0.10	0.30	1.0	365.4
Analysis Batch: 660-104653	Date Analyzed: 12/29/2010 1114						
Prep Batch: 660-104577	Date Prepared: 12/28/2010 1300						

General Chemistry

Client Sample ID: **WCS-3**

Lab Sample ID: 660-38920-2 Date Sampled: 12/21/2010 1253
Client Matrix: Water Date Received: 12/21/2010 1400

Analyte	Result	Qual	Units	MDL	PQL	Dil	Method
Nitrate as N	0.51		mg/L	0.10	0.50	1.0	353.2
Analysis Batch: 660-104481	Date Analyzed: 12/21/2010 1900						
Phosphorus, Total	1.4		mg/L	0.10	0.30	1.0	365.4
Analysis Batch: 660-104653	Date Analyzed: 12/29/2010 1114						
Prep Batch: 660-104577	Date Prepared: 12/28/2010 1300						

General Chemistry

Client Sample ID: **WCS-4**

Lab Sample ID: 660-38920-3 Date Sampled: 12/21/2010 1206

Client Matrix: Water Date Received: 12/21/2010 1400

Analyte	Result	Qual	Units	MDL	PQL	Dil	Method
Nitrate as N	1.9		mg/L	0.10	0.50	1.0	353.2
Analysis Batch: 660-104481	Date Analyzed: 12/21/2010 1900						
Phosphorus, Total	3.7		mg/L	0.10	0.30	1.0	365.4
Analysis Batch: 660-104653	Date Analyzed: 12/29/2010 1114						
Prep Batch: 660-104577	Date Prepared: 12/28/2010 1300						

DATA REPORTING QUALIFIERS

Client: Mallard, Inc. Job Number: 660-38920-1

Lab Section	Qualifier	Description
General Chemistry		
	J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
	U	Indicates that the compound was analyzed for but not detected.
	I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

Client: Mallard, Inc.

Job Number: 660-38920-1

Method Blank - Batch: 660-104481

Method: 353.2
Preparation: N/A

Lab Sample ID: MB 660-104481/1
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 12/21/2010 1900
Date Prepared: N/A

Analysis Batch: 660-104481
Prep Batch: N/A
Units: mg/L

Instrument ID: LACHAT
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	Result	Qual	MDL	PQL
Nitrate Nitrite as N	0.10	U	0.10	0.50
Nitrite as N	0.10	U	0.10	0.50
Nitrate as N	0.10	U	0.10	0.50

Lab Control Sample - Batch: 660-104481

Method: 353.2
Preparation: N/A

Lab Sample ID: LCS 660-104481/2
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 12/21/2010 1900
Date Prepared: N/A

Analysis Batch: 660-104481
Prep Batch: N/A
Units: mg/L

Instrument ID: LACHAT
Lab File ID: N/A
Initial Weight/Volume: 1.0 mL
Final Weight/Volume: 10 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate Nitrite as N	1.00	0.941	94	90 - 110	
Nitrite as N	0.997	0.984	99	90 - 110	

Client: Mallard, Inc.

Job Number: 660-38920-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 660-104481

Method: 353.2
Preparation: N/A

MS Lab Sample ID:	660-38909-A-1 MS	Analysis Batch:	660-104481	Instrument ID:	LACHAT
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.0 mL
Date Analyzed:	12/21/2010 1900			Final Weight/Volume:	25 mL
Date Prepared:	N/A				

MSD Lab Sample ID:	660-38909-A-1 MSD	Analysis Batch:	660-104481	Instrument ID:	LACHAT
Client Matrix:	Water	Prep Batch:	N/A	Lab File ID:	N/A
Dilution:	1.0			Initial Weight/Volume:	1.0 mL
Date Analyzed:	12/21/2010 1900			Final Weight/Volume:	25 mL
Date Prepared:	N/A				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Nitrate Nitrite as N	95	94	90 - 110	1	30		
Nitrite as N	103	103	90 - 110	0	30		

Client: Mallard, Inc. Job Number: 660-38920-1

Method Blank - Batch: 660-104577

Method: 365.4
Preparation: 365.2/365.3/365

Lab Sample ID: MB 660-104577/10-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 12/29/2010 1114
Date Prepared: 12/28/2010 1300

Analysis Batch: 660-104653
Prep Batch: 660-104577
Units: mg/L

Instrument ID: SEAL1
Lab File ID: N/A
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Result	Qual	MDL	PQL
Phosphorus, Total	0.10	U	0.10	0.30

Lab Control Sample - Batch: 660-104577

Method: 365.4
Preparation: 365.2/365.3/365

Lab Sample ID: LCS 660-104577/11-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 12/29/2010 1114
Date Prepared: 12/28/2010 1300

Analysis Batch: 660-104653
Prep Batch: 660-104577
Units: mg/L

Instrument ID: SEAL1
Lab File ID: N/A
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Phosphorus, Total	1.00	1.10	110	90 - 110	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 660-104577

Method: 365.4
Preparation: 365.2/365.3/365

MS Lab Sample ID: 660-38954-A-2-B MS
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 12/29/2010 1114
Date Prepared: 12/28/2010 1300

Analysis Batch: 660-104653
Prep Batch: 660-104577

Instrument ID: SEAL1
Lab File ID: N/A
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

MSD Lab Sample ID: 660-38954-A-2-C MSD
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 12/29/2010 1114
Date Prepared: 12/28/2010 1300

Analysis Batch: 660-104653
Prep Batch: 660-104577

Instrument ID: SEAL1
Lab File ID: N/A
Initial Weight/Volume: 20 mL
Final Weight/Volume: 20 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Phosphorus, Total	111	99	90 - 110	9	30	J3	

TestAmerica Tampa
6712 Benjamin Road Suite 100
Tampa, FL 33634
Phone (813) 885-7427 Fax (813) 885-7049

660-38920

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Maura Clark	Lab PM: Atkins, Amy	Carrier Tracking No(s):	COC No: 660-32963.1
Client Contact: Maura Clark	Phone: 813-935-2073	E-Mail: amy.atkins@testamericainc.com		Page: Page 1 of 1
Company: Mallard, Inc.				Job #:
Address: 10801 N. Newport Avenue	Due Date Requested:			
City: Tampa	TAT Requested (days):			
State, Zip: FL, 33612				
Phone: 813-935-2073	PO #: Purchase Order not requir			
Email: flduck@verizon.net	WO #:			
Project Name: Dunedin	Project #: 66003333			
Site: Dunedin Public Works	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	365.1 - Phosphorus	353.2 - Nitrate	Total Number of containers	Special Instructions/Note:
			Preservation Code:				S	N		
WCS-1	12/21/10	1157	G	Water			X	X	2	
WCS-3	12/21/10	1253	G	Water			X	X	2	
WCS-4	12/21/10	1206	G	Water			X	X	2	

Page 14 of 15

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Maura Clark Date: 12-17-10 Time: 1700 Method of Shipment: CPO

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Maura Clark	12/21/10 1400	Mallard	Amanda Hanson	12/21/10 1400	TT
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.7° C ON07

Login Sample Receipt Check List

Client: Mallard, Inc.

Job Number: 660-38920-1

Login Number: 38920

List Source: TestAmerica Tampa

Creator: Harrison, Amanda

List Number: 1

Question	T / F/ NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	4.7 degrees C Cu-07
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	