West Bloomfield School District
TMDL Sample Locations

Facility	Outfall/ Point of Discharge	Receiving Waters	Watershed	Parameter
Abbott Middle School	None	N/A	N/A	N/A
Administration Building	AMS-08.OP.OF	Hayes Creek	Huron River	Phosphorous
	AMS-02.MH (Sampling representative basin upstream of AMS-09.OP.OF)	Hayes Creek	Huron River	Phosphorous
Doherty Elementary School	DOH-07.OP.OF	Franklin Branch of the Rouge River	Rouge River	E. coli & Biota
	DOH-08.OP.OF	Franklin Branch of the Rouge River	Rouge River	E. coli & Biota
	DOH-09.CB.DP	Franklin Branch of the Rouge River	Rouge River	E. coli & Biota
Ealy Elementary School - **SOLD**	N/A	N/A	N/A	N/A
Facilities & Operations Building	N/A	N/A	N/A	N/A
Gretchko Elementary School	N/A	N/A	N/A	N/A
Orchard Lake Middle School	OLK-02.MH.DP	Franklin Branch of the Rouge River	Rouge River	E. coli & Biota
Roosevelt Elementary School	N/A	N/A	N/A	N/A
Scotch Elementary School	SCH-10.CB.DP	Hayes Creek	Huron River	Phosphorous
	SCH-12.MH.DP	Hayes Creek	Huron River	Phosphorous
Sheiko Elementary School - formerly Green Elementary School	GRN-08.MH.DP	Franklin Branch of the Rouge River	Rouge River	E. coli & Biota
West Bloomfield High School	WTB-53.OP.OF	Simpson Lake	Rough River	E. coli & Biota
	WTB-54.OP.OF	Simpson Lake	Rouge River	E. coli & Biota

June 12, 2019

Mr. Ted Stinson
Supervisor of Facility Operations, Maintenance, and Sustainability
West Bloomfield School District
3340 Orchard Lake Road
Bloomfield Hills, Michigan 48324
Theodore.stinson@wbsd.org

RE: **Project # AE190001 WeBSD**
Total Maximum Daily Load (TMDL) Sampling Report
Administration Building

Dear Mr. Stinson:

Arch Environmental Group, Inc. recently conducted a round of TMDL Wet Weather Sampling at discharge point/outfalls AMS-02.MH (Representative location upstream of AMS-09.OP.OF) and AMS-08.OP.OF at the Administration Building on May 22, 2019, in accordance with the applicable NPDES Permit requirements. TMDL sampling is used to determine the level of specific pollutants in the stormwater system by collecting samples from 50% of the district's stormwater outfalls/discharge points during a representative wet weather event. The sampling results are then evaluated to determine if a particular point source needs to be addressed to reduce the pollutant load of the receiving waters. A report regarding the findings of this round of TMDL Sampling is attached.

If you have questions regarding this report, please feel free to contact please feel free to contact the cleanWATER team at (248) 426-0165.

Sincerely,

Arch Environmental Group, Inc.
Environmental Services

Kellie Das

Kellie Das
Technician II

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5.0 Best Management Practices to Reduce TMDL Pollutant Loads

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TMDL Screening Inspection Logs
Storm Sewer System Site Map
Analytical Results & Chain of Custody

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) recently conducted a round of Total Maximum Daily Load (TMDL) Sampling for phosphorus at discharge locations AMS-02.MH(Representative location upstream of AMS-09.OP.OF) and AMS-08.OP.OF at Administration Building on May 22, 2019, in accordance with the applicable National Pollutant Discharge Elimination System (NPDES) Permit requirements.

A TMDL describes the process used to determine how much of a pollutant a lake or stream can assimilate and sets pollutant reduction targets for that water body. NPDES Municipal Separate Storm Sewer System (MS4) permits require regulated public entities located within urbanized areas that discharge storm water to an MS4 which leads to a water body designated with a TMDL, to demonstrate progress toward meeting Water Quality Standards (WQS). If the TMDL was written for E. coli or Total Phosphorus (TP), the MS4 permits further require permittees to collect representative samples of storm water discharges from their points of discharge to MS4s which lead to the impacted water bodies.[1] Based on a review of the sampling results, Stormwater Best Management Practices (BMP) implementation will be reviewed and BMPs may be updated to ensure progress toward achieving TMDL pollutant load reductions.

The receiving water body of Administration Building is the Hayes Creek of the Huron River. he Hayes Creek is upstream of Strawberry Lake which has been designated with a TMDL of Phosphorus. Further details on the TMDL(s) listed can be found in the document "Total Maximum Daily Load (TMDL) for Phosphorus in Strawberry Lake" Some examples of potential sources of phosphorus in waterways include the use of phosphorus containing fertilizers, manure, decomposition, and organic wastes.

2.0 / TMDL Sampling Procedures

Applicable TMDL sampling was conducted with guidance from the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Sampling was conducted at designated outfalls/discharge points after a dry period of approximately 48-72 hours and during a rain event of approximately .25 inches or more. Please see the attached TMDL Screening Inspection Logs for specific rainfall amounts. Sampling was conducted on May 22, 2019 and the last significant rain event was on May 19, 2019. The weather history for the rain event is available upon request.

When a dip-cup or similar sampling device was needed to collect the sample, a blank sample was collected to ensure no contamination was coming from the sampling device. The blank collected during this round of TMDL sampling came back at "Not Detected" for phosphorus indicating that the sampling device used was not contaminated. The lab results of the blank sample are attached. Furthermore, all sampling devices were decontaminated with distilled water between each sampling location according to the protocol laid out in the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Each location sampled was analyzed for pH and temperature while on-site and the sampled outfall/discharge point (OF/DP) was inspected for color, odor, and abnormal vegetative growth. The collected samples were delivered to an external laboratory for analysis.

3.0 / TMDL Sampling Results

<u>TMDL Benchmark Standards for Phosphorus:</u>

- Phosphorus: The WQS for phosphorus is the maximum amount of total phosphorus that is allowable in a designated waterway. Each receiving water has its own designated maximum. This means that the daily

[1] Storm Water Sampling Guidance for Total Phosphorus & *E. coli.* November 24, 2009. DEQ

maximum for one waterbody may be different from that of another waterbody Hayes Creek is upstream of Strawberry Lake which has the designated phosphorous TMDL of 25 ug/L. [2]

Structure ID: AMS-02.MH	Structure Type: Manhole	Location: West of the school, in the sidewalk by the playground

At the time of the sampling, clear water flow was noted, and AMS-02.MH was free of odors, and abnormal vegetative growth. The outfall AMS-09.OP.OF was completely submerged, so the first upstream structure AMS-02.MH out pipe was sampled to represent the outfall's phosphorus levels. AEG collected a grab sample from AMS-02.MH and the sample was screened for temperature and pH in the field. A phosphorus grab sample was delivered to an external laboratory for analysis. Results from the sampling are summarized below. A more detailed TMDL Screening Inspection Log is also attached at the end of the report.

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8.27	6.5 - 9	pH Units
Temperature	12.8	N/A	Celsius
Total Phosphorus	54	25	ug/L

The sample results for AMS-02.MH did not identify elevated levels of pH above the TMDL Benchmark Standards. However, highlighted values in the tables above indicate that for outfall location AMS-02.MH, the reported levels the reported levels for total phosphorus (54 ug/L) are above Michigan Department of Environmental Quality daily maximum of 25 ug/L for Hayes Creek.

Structure ID: AMS-08.OP.OF	Structure Type: Open Pipe	Location: Southwest of parking lot in the woods

At the time of the sampling, clear water flow was noted, and AMS-08.OP.OF was free of odors, and abnormal vegetative growth. AEG collected a grab sample from AMS-08.OP.OF and the sample was screened for temperature and pH in the field. A phosphorus grab sample was delivered to an external laboratory for analysis. Results from the sampling are summarized below. A more detailed TMDL Screening Inspection Log is also attached at the end of the report.

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8.67	6.5 - 9	pH Units
Temperature	14.7	N/A	Celsius
Total Phosphorus	190	25	ug/L

The sample results for AMS-08.OP.OF did not identify elevated levels of pH above the TMDL Benchmark Standards. However, highlighted values in the tables above indicate that for outfall location AMS-08.OP.OF, the reported levels the reported levels for total phosphorus (190 ug/L) are above Michigan Department of Environmental Quality daily maximum of 25 ug/L for Hayes Creek.

[2] "Total Maximum Daily Load for Phosphorus in Strawberry Lake" May 2000. MDEQ

4.0 / Conclusion

AEG did not identify any elevated levels of pH above the TMDL Benchmark Standards for discharge locations AMS-02.MH and AMS-08.OP.OF sampled at the Administration Building on May 22, 2019. However, AEG did identify elevated levels of phosphorus above the TMDL Benchmark Standards for discharge locations AMS-02.MH and AMS-08.OP.OF.

Arch Environmental Group, Inc. recommends that the elevated locations AMS-02.MH and AMS-08.OP.OF be re-assessed each permit cycle to ascertain whether greater or reduced potential for phosphorus TMDL contribution has occurred. Additionally, these sites will be monitored annually during regularly scheduled Routine Storm sewer Structural Inspections for changes in conditions or site activities.

Some potential sources of phosphorus in waterways are phosphorus containing fertilizers, manure, decomposing matter (such as wildlife feces), erosion, and organic wastes.[3] Elevated levels of phosphorus typically occur at sites which have large populations of wild or domesticated animals, and/or that use phosphorus containing fertilizers. Phosphorus originating from the breakdown of other organic materials may be present in stormwater runoff as well. In an effort to determine the cause of the benchmark exceedance of phosphorus, Arch Environmental Group reviewed the layout of the school storm water system and surrounding area land use. The most recent Dry Weather Screening inspection conducted on September 11, 2017 at the Admin Building did not identify any signs of an illicit connection at this facility. The Dry Weather Screening report is available upon request. The surrounding land is used for residential use, as well as a close by golf course. The potential sources of phosphorus near the school are fertilizers, decomposing matter (such as wildlife feces), erosion, and organic wastes.

5.0 / Best Management Practices to Reduce TMDL Pollutant Loads

The West Bloomfield School District Stormwater Management Plan (SWMP) identifies and defines the districts BMPs to comply with the Six Minimum Measures that are the front line in the nationwide effort to reducing polluted stormwater discharges to our lake, rivers and streams. The Michigan Department of Environmental Quality (MDEQ) recognizes that having a Stormwater Management Plan in place built around the Six Minimum Measures specified in the NPDES General Jurisdictional Permit have the potential to significantly contribute to the reduction of TMDL Pollutants in the surface waters of the state. A link to the districts current SWMP can be found on the district's website at https://www.wbsd.org/Page/3784. The Six Minimum Measures are listed below:

- Public Education and Outreach Program (PEP)
- Public Involvement and Participation Program (PIP)
- Illicit Discharge Elimination Program (IDEP)
- Post Construction Stormwater Management Program
- Construction Site Stormwater Runoff Control Program
- Pollution Prevention/Good Housekeeping Program.

The following is a list of prioritized TMDL best management practices from the districts SWMP that West Bloomfield School District should continue to implement in order to improve water quality impairments associated with the Phosphorus TMDL of the Hayes Creek. Prioritization of BMPs is based on West Bloomfield School District targeted TMDL pollutants. Priority is given to BMPs that reduce E. coli and phosphorus loads and address water quality for biota and dissolved oxygen.

[3] "Phosphate in Surface Waters Streams Lakes" – Water Research Center – Brian Oram (PG) https://www.water-research.net/index.php/phosphate-in-water

PHOSPHOROUS

1. The use of Phosphorous containing fertilizers is restricted for use at all WEBSD facilities (unless soil testing indicates the necessity of adding phosphorous). In addition, all fertilizer use is restricted to athletic fields and/or areas designated as "curb appeal".
2. WEBSD will continue to use its website to provide the public information regarding pesticide use, pollution prevention, soil testing, stream buffers, and lawn fertilizers.
3. WEBSD will continue to use its website to provide the public with information on "school" carwashes.
4. WEBSD will continue to use its website to provide the public with information regarding pet waste. Additionally, SEMCOG pet waste posters are placed at various school buildings.
5. WEBSD has established programs for soil erosion and sediment control from new or redevelopment construction. Such developments require permits and inspections for practices to keep exposed soils on site or controlled from runoff. WEBSD conducts routine visual inspections of stormwater structural controls. WEBSD will remove excessive sediments from structural sediment removal systems to maintain the maximum designed performance. Sediments will be disposed of offsite in accordance with Parts 115 or 121.

ALL TMDLs

1. WEBSD will continue to use its website to provide the public information regarding local TMDL issues (phosphorous, E. coli, and biota TMDL Best Management Practice).
2. WEBSD will continue to educate staff, faculty, and students using various venues including the **"Seven Simple Steps to Clean Water"** program educational materials developed by the various watershed groups specifically related to these issues on the stormwater management webpage.
3. The district passed a post-construction stormwater board resolution to require implementation of the stormwater standards for construction.
4. Adequately maintains vegetation around stormwater facilities, ditches, and ponds.
5. Provide training to applicable staff and confirm training from contractors including restrictions on the use of phosphorous containing fertilizers, soaps, cleaners and other chemicals that could impact the separate storm drain system.

WeBSD strives to be good stewards of the land within their jurisdiction and to use appropriate Best Management Practices (BMPs) to contribute to the improvement of water quality. WeBSD is committed to practicing sound stormwater management practices; including observance and adherence to all local, state, and federal stormwater statutes, rules, and regulations.

Attachments: TMDL Screening Inspection Logs
Storm Sewer System Site Map
Analytical Results & Chain of Custody

cc: AE190001 project file

TMDL Screening Inspection Log

Building:	Administration Building		**Client:**	West Bloomfield School District
Inspectors:	Kellie Das	Steven Ripley	**Date**	5/22/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**AMS-02.MH**	Structure Type	Manhole	Lat:		Long:
Type:		Location:	West of the school, in the sidewalk by the playground			
Outfall Dimensions	8”					

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Trickle
Source of Flow:	Upstream structures and rainfall
Velocity of Flow:	Trickle
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

The outfall AMS-09.OP.OF was submerged in the receiving waters, so the representative upstream manhole AMS-02.MH was sampled to represent the outfall's phosphorus levels. Elevated phosphorus levels are likely due to decaying organic matter and potentially fertilizer.

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Threshold:**	**Units:**
Sample ID:	AMS-02.MH TMDL	pH:	8.27	6.5 - 9	pH units
Time Collected:	11:11	Temperature:	12.8	N/A	Celsius
Last Rain Event:	>72 Hours	E. coli:	N/A	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	54	25	ug/L
Sample Location Type:	Manhole	Other:			
Total Rainfall (Inches)	0.28"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

TMDL Screening Inspection Log

Building:	Administration Building		**Client:**	West Bloomfield School District
Samplers:	Kellie Das	Steven Ripley	**Date**	5/22/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**AMS-08.OP.OF**	Structure Type	Open Pipe Outlet	Lat:	42.590748	Long:	83.399148
Type:	Outfall	Location:	Southwest of parking lot in the woods				
Outfall Dimensions	18”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	Upstream structures
Velocity of Flow:	Substantial
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

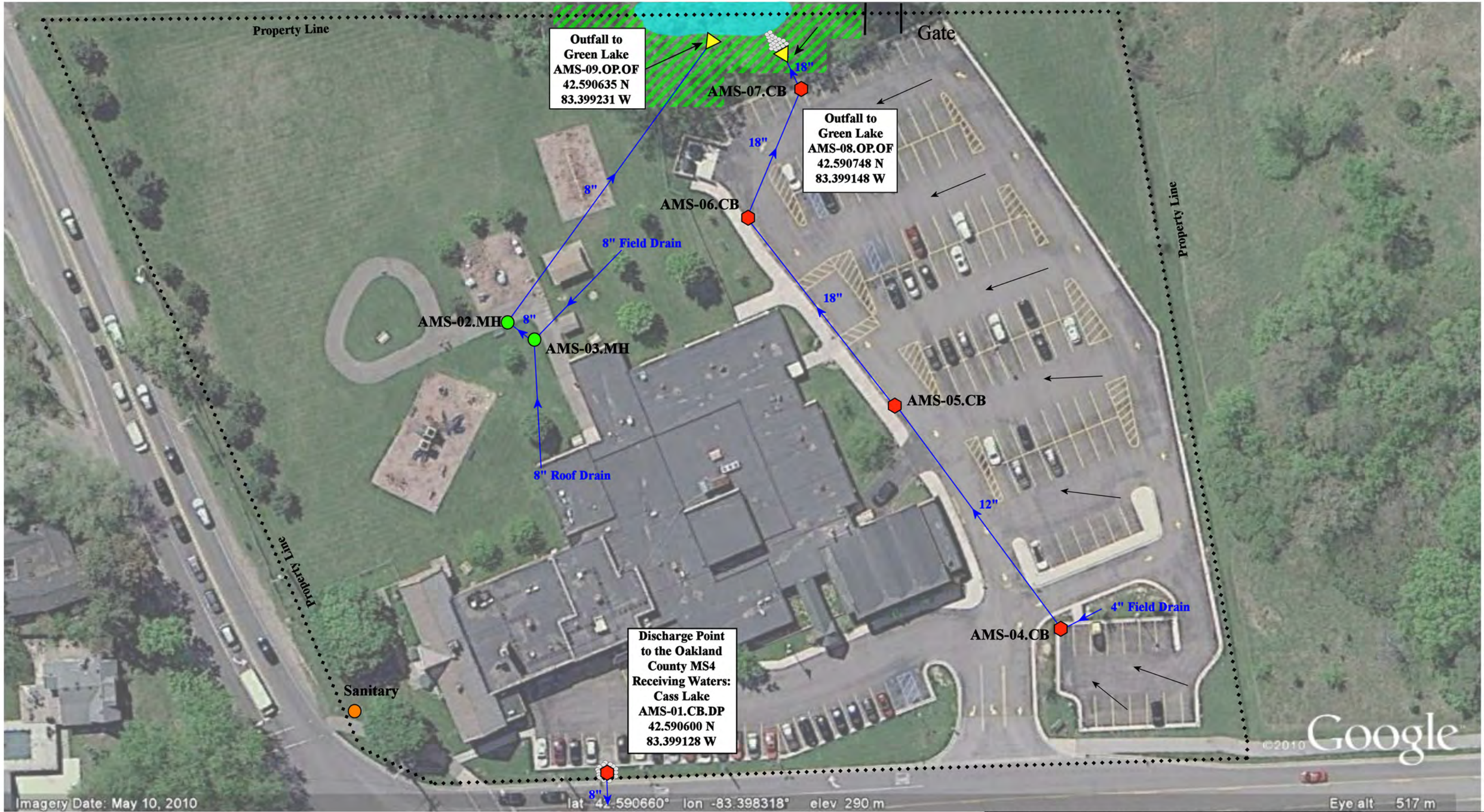
Elevated phosphorus levels are likely due to decaying organic matter.

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Threshold:**	**Units:**
Sample ID:	AMS-08.OP.OF TMDL	pH:	8.67	6.5 - 9	pH units
Time Collected:	11:00	Temperature:	14.7	N/A	Celsius
Last Rain Event:	>72 Hours	E. coli:	N/A	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	190	25	ug/L
Screening Location Type:	Open Pipe Outlet	Other:			
Total Rainfall (Inches):	0.28"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com



= Catch Basin

= Open Pipe Outlet

= Manhole

= Wetland

= Buffer & Filter Strip

= Rip Rap

North

5810 Commerce Road, West Bloomfield Township, MI 48324

Administration Building

West Bloomfield School District

37720 Interchange Drive
Farmington Hills, MI 48335
Phone: 248-426-0165
Fax: 248-427-0305

Date:	7/12/2017
Drawn by:	AK
Reviewed:	LK
Page #:	1 of 1
Scale:	Not to Scale

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 30, 2019

Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

Subject: Administration Building TMDL
AE190001 WeBSD

Dear Ms. Sendra :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/22/2019 for the above mentioned project. NELAP/TNI Accredited Analysis and MDEQ Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 58648 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/22/2019
Submit Date: 05/22/2019
Report Date: 05/30/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **58648**
BA Sample ID: **CK02174**
Project Name: **Administration Building TMDL**
Project Number: **AE190001 WeBSD**
Sample ID: **Dip Cup Blank TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Inorganic Analysis						
Phosphorus (total)	**Not detected**	ug/L	10	SM4500 PE	MB	05/30/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/30/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/22/2019
Submit Date: 05/22/2019
Report Date: 05/30/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **58648**
BA Sample ID: **CK02175**
Project Name: **Administration Building TMDL**
Project Number: **AE190001 WeBSD**
Sample ID: **AMS-08 OP OF TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Inorganic Analysis						
Phosphorus (total)	**190**	ug/L	10	SM4500 PE	MB	05/30/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/30/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/22/2019
Submit Date: 05/22/2019
Report Date: 05/30/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **58648**
BA Sample ID: **CK02176**
Project Name: **Administration Building TMDL**
Project Number: **AE190001 WeBSD**
Sample ID: **AMS-02 MH TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Inorganic Analysis						
Phosphorus (total)	**54**	ug/L	10	SM4500 PE	MB	05/30/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/30/2019

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: 58648

PAGE: 1 OF 1

PROJECT NAME: (48 SPACES MAXIMUM) Administration Building TMDL

PROJECT NUMBER: (25 SPACES MAXIMUM) AE190001

P.O. NUMBER: West Bloomfield School District

Sample collected by: Kellie DaS

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab) ☐
RUSH: 2 Business days ☐
RUSH: 3 Business days ☐
RUSH SURCHARGE
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Time	Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE $H2SO_4$	HDPE NAOH	AMBER GLASS	AMBER GLASS $H2SO_4$	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	Phosphorus (Total)
1X02174	Dipcup Blank TMDL	10:36	5/22/19						X						L	X
2) 75	AMS-08.OP.OF TMDL	11:00	5/22/19						X						L	X
3) 76	AMS-02.MH TMDL	11:11	5/22/19						X						L	X
4)																
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

REPORT RESULTS TO:
Arch Environmental group

Attn:
PHONE:
FAX:
EMAIL: labs@archenvgroup.com

Sample received within holding time? yes ☑ no ☐
Temperature of samples °C 3
pH verified in login? yes ☑ no ☐
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☑
Sample containers and COC match? yes ☑ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☑
Chlorinated Water Supply? yes ☐ no ☑

MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1	Kellie DaS		5-22-19	1:00p	3				
2		5-22-19	1400		4				

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: MB **Parameter:** PHOS

Analysis Date: 5/30/2019 **Method Reference:** SM4500PE

SPIKE - ACCURACY					
Laboratory Identification	**Spike Conc. (µg/L)**	**Background (µg/L)**	**Percent Recoveries**	**Acceptable Range (%)**	**Method Blank Concentration**
CK2172	500	41	100/98	90-110	<10

SPIKE - PRECISION					
Laboratory Identification	**Observed A (µg/L)**	**Observed B (µg/L)**	**RPD**	**Acceptable Range**	
CK2172	538	529	1.69	≤ 20%	

MISCELLANEOUS			
	Standard ID #	**%Recovery**	
Independent Secondary Reference Material:	WP 270	99%	
Method Standard (Laboratory Control Spike):			

COMMENTS: _____

May 24, 2019

Mr. Ted Stinson
Supervisor of Operations and Maintenance
West Bloomfield School District
3340 Orchard Lake Road
Bloomfield Hills, Michigan 48324
Theodore.stinson@wbsd.org

RE: **Project # AE190001 WeBSD**
Total Maximum Daily Load (TMDL) Sampling Report
Doherty Elementary

Dear Mr. Stinson:

Arch Environmental Group, Inc. recently conducted a round of TMDL Wet Weather Sampling at discharge point/outfalls DOH-07.OP.OF, DOH-08.OP.OF, and DOH-09.CB.DP at Doherty Elementary on May 7, 2019 in accordance with the applicable NPDES Permit requirements. TMDL sampling is used to determine the level of specific pollutants in the stormwater system by collecting samples from 50% of the district's stormwater outfalls/discharge points during a representative wet weather event. The sampling results are then evaluated to determine if a particular point source needs to be addressed to reduce the pollutant load of the receiving waters. A report regarding the findings of this round of TMDL Sampling is attached.

If you have questions regarding this report, please feel free to contact please feel free to contact the cleanWATER team at (248) 426-0165.

Sincerely,

Arch Environmental Group, Inc.
Environmental Services

Carly Doulos
Technician II

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Storm Sewer System Site Map
Analytical Results & Chain of Custody
Dry Weather Screening Report

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) recently conducted a round of Total Maximum Daily Load (TMDL) Sampling for E. coli at discharge locations DOH-07.OP.OF, DOH-08.OP.OF, and DOH-09.CB.DP at Doherty Elementary on May 7, 2019, in accordance with the applicable National Pollutant Discharge Elimination System (NPDES) Permit requirements.

A TMDL describes the process used to determine how much of a pollutant a lake or stream can assimilate and sets pollutant reduction targets for that water body. NPDES Municipal Separate Storm Sewer System (MS4) permits require regulated public entities located within urbanized areas that discharge storm water to an MS4 which leads to a water body designated with a TMDL, to demonstrate progress toward meeting Water Quality Standards (WQS). If the TMDL was written for E. coli or Total Phosphorus (TP), the MS4 permits further require permittees to collect representative samples of storm water discharges from their points of discharge to MS4s which lead to the impacted water bodies.[1] Based on a review of the sampling results, Stormwater Best Management Practices (BMP) implementation will be reviewed and BMPs may be updated to ensure progress toward achieving TMDL pollutant load reductions.

Monitoring is not required for Biota/Sediment TMDLs under the MS4 permits.[2]

The receiving water body of Doherty Elementary is the Franklin Branch of the Rouge River. The Rouge River has been designated with the TMDL's of E. coli and Biota/Sediment. Further details on the TMDL's listed can be found in the documents "Total Maximum Daily Load for Biota for the River Rouge Watershed" and "Total Maximum Daily Load for E. Coli for the Rouge River". Some examples of potential sources of E. coli in waterways include fecal material from livestock, humans, wildlife, waterfowl such as geese, and sanitary systems. Some examples of potential sources of sediment include erosion and construction activities.

2.0 / TMDL Sampling Procedures

Applicable TMDL sampling was conducted with guidance from the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Sampling was conducted at designated outfalls/discharge points during a rain event of approximately .25 inches or more. Please see the attached TMDL Screening Inspection Log for specific rainfall amounts. Sampling was conducted on May 7, 2019 and the last significant rain event above .25 inches was on May 1, 2019. The weather history for the rain event is available upon request.

When a dip-cup or similar sampling device was needed to collect the sample, a blank sample was collected to ensure no contamination was coming from the sampling device. The blank collected during this round of TMDL sampling came back at zero (0) CFU for E. coli indicating that the sampling device used was not contaminated. The lab results of the blank sample are attached. Furthermore, all sampling devices were decontaminated with bleach water distilled water between each sampling location according to the protocol laid out in the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Each location sampled was analyzed for pH and temperature while on-site and the sampled outfall/discharge point (OF/DP) was inspected for color, odor, and abnormal vegetative growth. The collected samples were delivered to an external laboratory for analysis.

[1] Storm Water Sampling Guidance for Total Phosphorus & *E. coli.* November 24, 2009. DEQ

[2] Addressing Biota TMDLs in Municipal Separate Storm Sewer System Permits" April 5, 2010. DNRE

3.0 / TMDL Sampling Results

TMDL Benchmark Standards for E. coli:

- E. coli: The WQS for E. coli is the maximum amount of E. coli that is allowable in surface waters of the state. These standards are known as total body contact and partial body contact standards. Total body contact is a more conservative standard used during the summer to protect swimmers during total body contact and has the daily maximum of 300 CFU per 100 milliliters (mL). This applies to the warmer months of May 1st -October 31stand is the standard being used in this report. Partial body contact is the daily maximum of 1,000 CFU per 100 mL and applies to the waterways year-round. [3]

Structure ID: DOH-07.OP.OF	**Structure Type: Open Pipe**	**Location: East of the building, southwest of the basketball court, in the woods**
Structure ID: DOH-08.OP.OF	**Structure Type: Open Pipe**	**Location: South of the building, southwest of 15, inside fence**
Structure ID: DOH-09.CB.DP	**Structure Type: Catch Basin**	**Location: Northwest corner of building, in grass near door**

At the time of the sampling, clear water flow was noted, and DOH-07.OP.OF, DOH-08.OP.OF and DOH-09.CB.DP were free of odors, and abnormal vegetative growth. AEG collected a grab sample from DOH-07.OP.OF, DOH-08.OP.OF and DOH-09.CB.DP and the samples were screened for temperature and pH in the field. An E. coli grab sample was delivered to an external laboratory for analysis. Results from the sampling are summarized below. A more detailed TMDL Screening Inspection Log is also attached at the end of the report.

DOH-07.OP.OF

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8.25	6.5 - 9	pH Units
Temperature	11.5	N/A	Celsius
E. coli	478.6	300	CFU per 100mL

DOH-08.OP.OF

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8.25	6.5 - 9	pH Units
Temperature	9.4	N/A	Celsius
E. coli	456.9	300	CFU per 100mL

DOH-09.CB.DP

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8.1	6.5 - 9	pH Units
Temperature	8.8	N/A	Celsius
E. coli	422.5	300	CFU per 100mL

[3] "Michigan's E. Coli Water Quality Standard Guidance" May, 2016. MDEQ

4.0 / Conclusion

AEG did not identify any elevated levels of pH above the TMDL Benchmark Standards for discharge locations DOH-07.OP.OF, DOH-08.OP.OF and DOH-09.CB.DP sampled at Doherty Elementary on May 7, 2019. However, AEG did identify elevated levels of E. coli above the total body contact TMDL Benchmark Standards (E. coli >300 CFU) for discharge locations DOH-07.OP.OF, DOH-08.OP.OF and DOH-09.CB.DP.

Arch Environmental Group, Inc. recommends that the elevated locations DOH-07.OP.OF, DOH-08.OP.OF and DOH-09.CB.DP be re-assessed each permit cycle to ascertain whether greater or reduced potential for E. coli TMDL contribution has occurred. Additionally, these sites will be monitored annually during regularly scheduled BMP structural inspections for changes in conditions or site activities.

Geese, gulls and ducks are speculated to be a major bacterial source in urban areas, particularly where large populations congregate. E. coli (*Escherichia Coli)* is a sub-group of the fecal coliform group and can be used as an indicator of fecal contamination. E. coli bacteria exist in animal and human fecal matter.[4] Elevated levels of E. coli typically occur at sites which have leaking sanitary sewer systems, failed septic systems, or populations of wild or domesticated animals. E. coli originating from birds, raccoons and other wildlife may be present in large numbers in stormwater runoff. In an effort to determine the cause of the benchmark exceedance of E. coli, Arch Environmental Group reviewed the layout of the school storm water system. Based on this investigation, sanitary sewer contamination from Doherty Elementary is not suspected. Also, the most recent Dry Weather Screening inspection conducted on September 11, 2017 at Doherty Elementary did not identify any signs of an illicit connection at this facility. The Dry Weather Screening report is attached. The source is likely natural sources, such as the presence of wild animals from the grassed area surrounding the upstream stormwater system.

5.0 / Best Management Practices to Reduce TMDL Pollutant Loads

The West Bloomfield School District Stormwater Management Plan (SWMP) identifies and defines the districts BMPs to comply with the Six Minimum Measures that are the front line in the nationwide effort to reducing polluted stormwater discharges to our lake, rivers and streams. The Michigan Department of Environmental Quality (MDEQ) recognizes that having a Stormwater Management Plan in place built around the Six Minimum Measures specified in the NPDES General Jurisdictional Permit have the potential to significantly contribute to the reduction of TMDL Pollutants in the surface waters of the state. A link to the districts current SWMP can be found on the district's website at https://www.wbsd.org/Page/3784. The Six Minimum Measures are listed below:

- Public Education and Outreach Program (PEP)
- Public Involvement and Participation Program (PIP)
- Illicit Discharge Elimination Program (IDEP)
- Post Construction Stormwater Management Program
- Construction Site Stormwater Runoff Control Program
- Pollution Prevention/Good Housekeeping Program.

The following is a list of prioritized TMDL best management practices from the districts SWMP that West Bloomfield School District should continue to implement in order to improve water quality impairments associated with the E. coli and Biota/Sediment TMDL of the Franklin Branch of the Rouge River. Prioritization of BMPs is based

[4] Sources of E. coli In Surface Water" - Great Lakes Water Institute, University of Wisconsin, Milwaukee http://www.glwi.uwm.edu/research/genomics/ecoli/sources_of_ecoli_in_water.php

on West Bloomfield School District targeted TMDL pollutants. Priority is given to BMPs that reduce E. coli loads and address water quality for biota and dissolved oxygen.

E. COLI/BIOTA

1. WEBSD will use its website to provide the public with information regarding pet waste (SEMCOG links). Additionally, SEMCOG pet waste posters are placed at various school buildings.
2. WEBSD will prohibit illicit discharges, inspect and monitor suspected illicit discharges, and enforce elimination of the illicit discharges and connections.
3. WEBSD has reviewed all facilities for cross-connections between the sanitary and storm sewer systems.
4. WEBSD will conduct bimonthly inspections of parking lot and curb areas and hand clean as needed.
5. WEBSD has established programs for soil erosion and sediment control from new or redevelopment construction. Such developments require permits and inspections for practices to keep exposed soils on site or controlled from runoff.
6. WEBSD has implemented routine visual inspections of stormwater structural controls.
7. WEBSD will remove excessive sediments from structural sediment removal systems to maintain the maximum designed performance. Sediments will be disposed of offsite in accordance with Parts 115 or 121.

ALL TMDLs

1. WEBSD will continue to use its website to provide the public information regarding local TMDL issues (phosphorous, E. coli, and biota TMDL Best Management Practice).
2. WEBSD will continue to educate staff, faculty, and students using various venues including the **"Seven Simple Steps to Clean Water"** program educational materials developed by the various watershed groups specifically related to these issues on the stormwater management webpage.
3. The district passed a post-construction stormwater board resolution to require implementation of the stormwater standards for construction.
4. Adequately maintains vegetation around stormwater facilities, ditches, and ponds.
5. Provide training to applicable staff and confirm training from contractors including restrictions on the use of phosphorous containing fertilizers, soaps, cleaners and other chemicals that could impact the separate storm drain system.

WeBSD strives to be good stewards of the land within their jurisdiction and to use appropriate Best Management Practices (BMPs) to contribute to the improvement of water quality. WeBSD is committed to practicing sound stormwater management practices; including observance and adherence to all local, state, and federal stormwater statutes, rules, and regulations.

Attachments: TMDL Screening Inspection Log
Storm Sewer System Site Map
Analytical Results & Chain of Custody
Dry Weather Screening Report

cc: AE190001 project file

TMDL Screening Inspection Log

Building:	Doherty Elementary School		**Client:**	West Bloomfield School District
Samplers:	Carly Doulos	Kellie Miller	**Date**	5/7/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**DOH-07.OP.OF**	Structure Type	Open Pipe Outlet	Lat:	42.55578	Long:	83.353171
Type:	Outfall	Location:	East of the building, southwest of the basketball court, in the woods				
Outfall Dimensions	12 "						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	DOH-16.CB and rainfall
Velocity of Flow:	Slow
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Thres**	**Units:**
Sample ID:	DOH-07.OP.OF.TMDL	pH:	8.25	6.5 - 9	pH units
Time Collected:	9:50	Temperature:	11.5	N/A	Celsius
Last Rain Event:	< 48 Hours	E. coli:	478.60	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	N/A		
Screening Location Type:	Open Pipe Outlet	Other:			
Total Rainfall (Inches):	0.9"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

TMDL Screening Inspection Log

Building:	Doherty Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Carly Doulos	Kellie Miller	**Date**	5/7/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**DOH-08.OP.OF**	Structure Type	Open Pipe Outlet	Lat:	42.555469	Long:	83.345035
Type:	Outfall	Location:	South of building, southwest of 15, inside fence				
Outfall Dimensions	10”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	DOH-15.CB and rainfall
Velocity of Flow:	Slow
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Thres**	**Units:**
Sample ID:	DOH-08.OP.OF TMDL	pH:	8.25	6.5 - 9	pH units
Time Collected:	10:05	Temperature:	9.4	N/A	Celsius
Last Rain Event:	< 48 Hours	E. coli:	456.9	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	N/A		
Sample Location Type:	Open Pipe Outlet	Other:			
Total Rainfall (Inches)	0.9"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

TMDL Screening Inspection Log

Building:	Doherty Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Carly Doulos	Kellie Miller	**Date**	5/7/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**DOH-09.CB.DP**	Structure Type	Catch Basin	Lat:	42.556612	Long:	83.354487
Type:	Discharge Point	Location:	Northwest corner of building, in grass near door				
Outfall Dimensions	10”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	DOH-11.CB, roof drain, trench
Velocity of Flow:	Slow
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

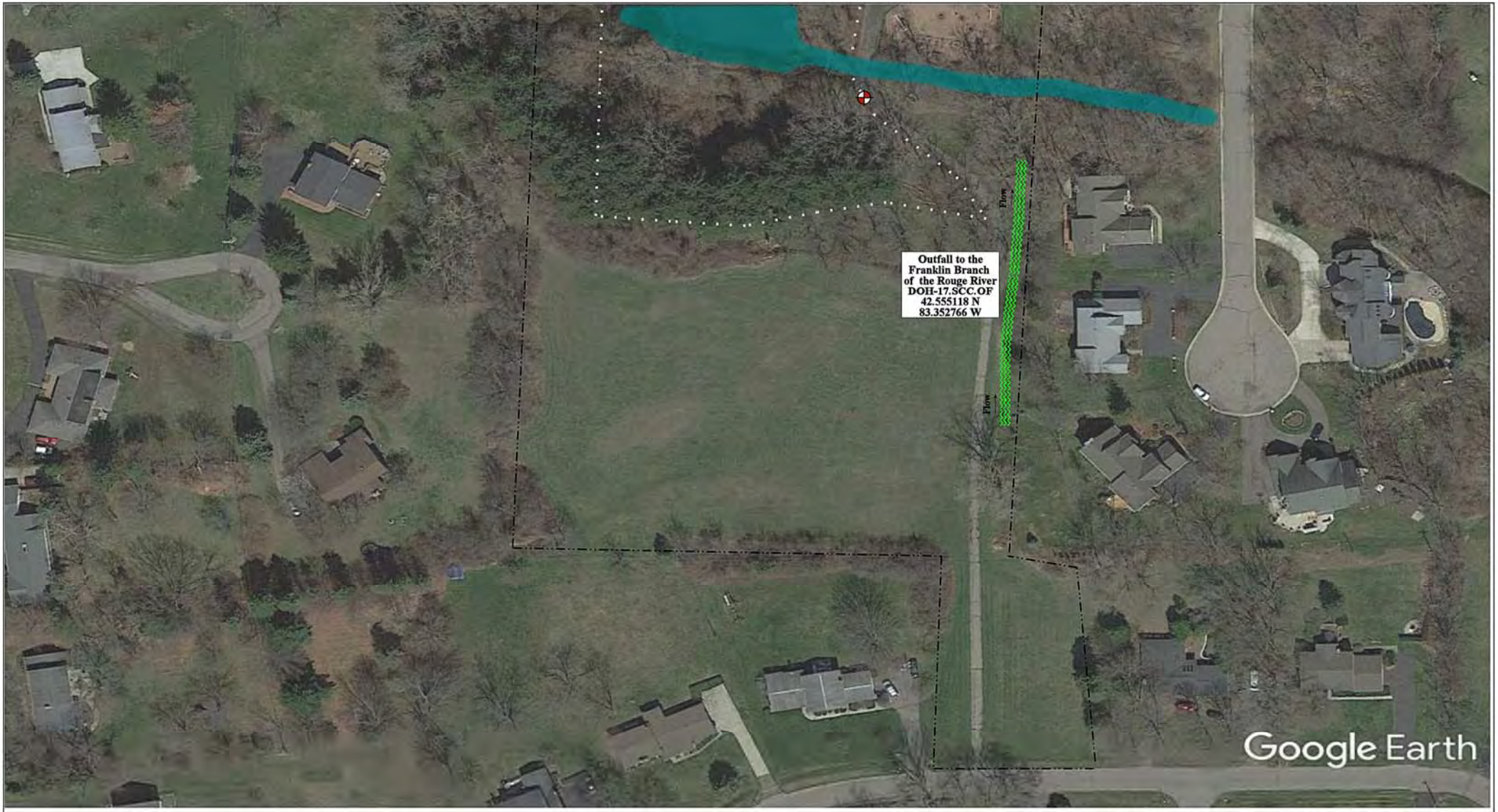
On a slope, near a heavily wooded area

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Thres**	**Units:**
Sample ID:	DOH-09.CB.DP TMDL	pH:	8.1	6.5 - 9	pH units
Time Collected:	10:25	Temperature:	8.8	N/A	Celsius
Last Rain Event:	< 48 Hours	E. coli:	422.5	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	N/A		
Sample Location Type:	Catch Basin	Other:			
Total Rainfall (Inches):	0.9"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com



= Property Boundary

= Fence Line

= Access Point

= Stormwater Conveyance Channel

North

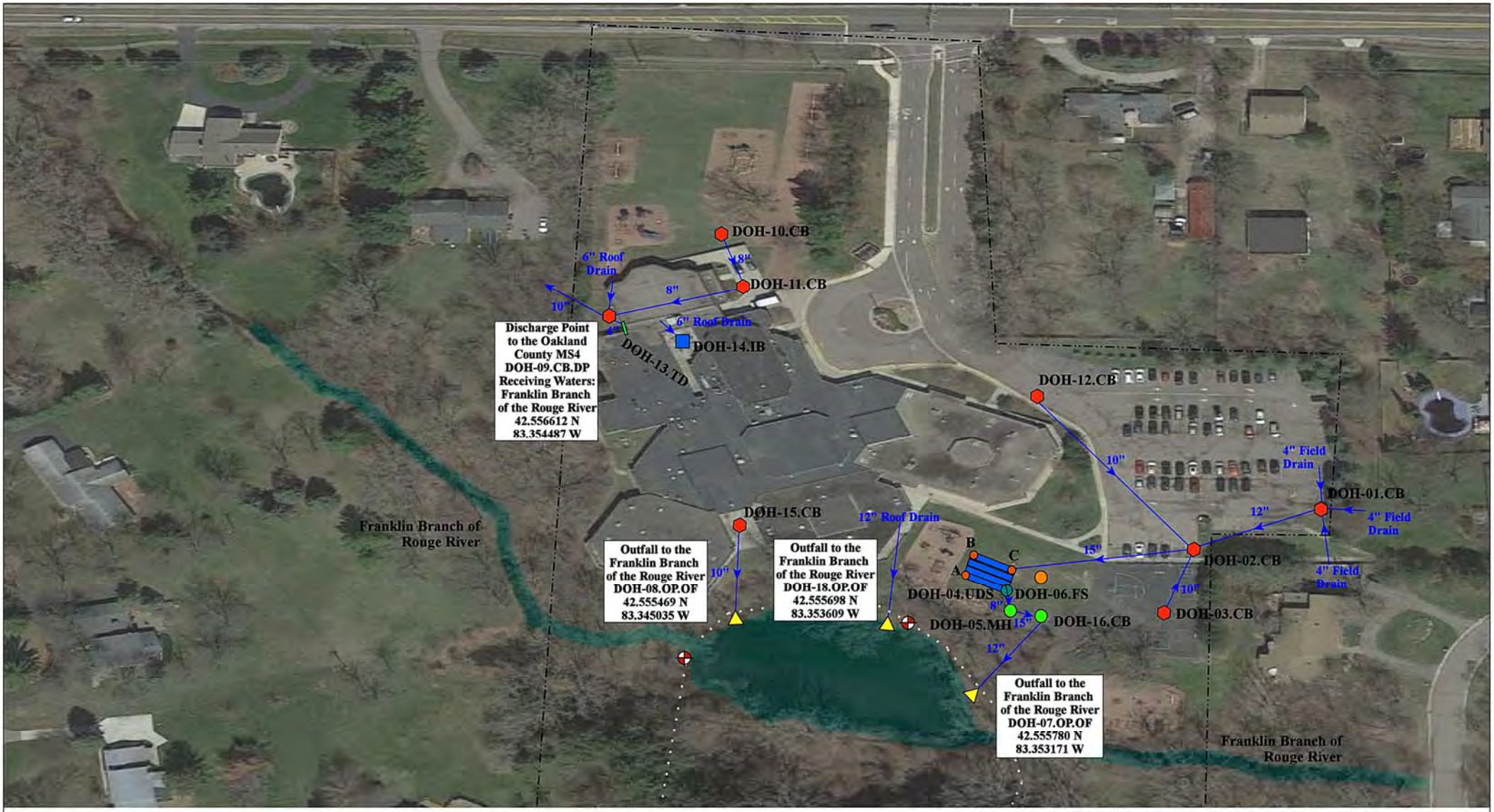
3675 Walnut Lake Road, West Bloomfield Twp. Michigan 48332

Doherty Elementary School

West Bloomfield School District

environmental group
37720 Interchange Drive
Farmington Hills, MI 48335
Phone: 248-426-0165
Fax: 248-427-0305

Revision Date :	4/16/2018
Drawn by:	SB
Reviewed:	LK
Page #:	1 of 1
Scale:	Not to Scale



= Catch Basin
= Manhole
= Open Pipe Outlet
= Underground Detention System
= Flow Splitter
= Infiltration Basin
= Sanitary
= Trench Drain
= Property Boundry
= Fence Line
= Access Point

North

3675 Walnut Lake Rd, West Bloomfield Twp. 48332

Doherty Elementary School

West Bloomfield School District

environmental group
37720 Interchange Drive
Farmington Hills, MI 48335
Phone: 248-426-0165
Fax: 248-427-0305

Revision Date :	4/16/2018
Drawn by:	SB
Reviewed:	LK
Page #:	1 of 1
Scale:	Not to Scale

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 08, 2019

Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

Subject: Doherty Elementary School TMDL
AE190001-WeBSD

Dear Ms. Sendra :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/07/2019 for the above mentioned project. NELAP/TNI Accredited Analysis and MDEQ Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 57826 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57826**
BA Sample ID: **CK01090**
Project Name: **Doherty Elementary School TMDL**
Project Number: **AE190001-WeBSD**
Sample ID: **DOH-07.OP.OF TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**478.6**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57826**
BA Sample ID: **CK01091**
Project Name: **Doherty Elementary School TMDL**
Project Number: **AE190001-WeBSD**
Sample ID: **DOH-08.OP.OF TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**456.9**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57826**
BA Sample ID: **CK01092**
Project Name: **Doherty Elementary School TMDL**
Project Number: **AE190001-WeBSD**
Sample ID: **DOH-09.CB.DP TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**422.5**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57826**
BA Sample ID: **CK01093**
Project Name: **Doherty Elementary School TMDL**
Project Number: **AE190001-WeBSD**
Sample ID: **Blank-TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**0**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: S7826

PROJECT NAME: (48 SPACES MAXIMUM) Doherty Elementary School TMDL

PROJECT NUMBER: (25 SPACES MAXIMUM) AE190001

P.O. NUMBER: West Bloomfield Public Schools

Sample collected by: Kellie Das

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab) 1 ☐
RUSH: 2 Business days 2 ☐
RUSH: 3 Business days 3 ☐
RUSH SURCHARGE 4 ☐
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Sampling Time	Sampling Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE H_2SO_4	HDPE NAOH	AMBER GLASS	AMBER GLASS H_2SO_4	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	e.Coli CFU
1) 90	DOH-07.OP.OF TMDL	9:50	5/7/19						X						L	X
2) 91	DOH-08.OP.OF TMDL	10:05	5/7/19						X						L	X
3) 92	DOH-09.CB.DP TMDL	10:25	5/7/19						X						L	X
4) 93	Blank-TMDL	9:40	5-7-19						X						L	X
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

PAGE: ___ OF ___

REPORT RESULTS TO:
Arch Environmental Group

Attn:
PHONE:
FAX:
EMAIL: labs@archenvgroup.com

Sample received within holding time? yes ☐ no ☐
Temperature of samples °C: on ice
pH verified in login? yes ☐ no ☐
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☑
Sample containers and COC match? yes ☐ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☐
Chlorinated Water Supply? yes ☐ no ☐

MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1	Kellie Das	[signature]	5-7-19	1515	3				
2					4				

June 18, 2018

Mr. Theodore Stinson
Supervisor of Facility Operations, Maintenance, and Sustainability
West Bloomfield School District
3340 Orchard Lake Road
Bloomfield Hills, Michigan 48324
Theodore.stinson@wbsd.org

RE: **AEG Project # AE180001 WeBSD**
Dry Weather Field Screening
Doherty Elementary School

Dear Mr. Stinson:

Arch Environmental Group, Inc. conducted a subsequent round of dry weather screening at discharge points/outfalls DOH-07.OP.OF, DOH-08.OP.OF, DOH-09.CB.DP, DOH-17.SCC.OF, and ODH-18.OP.OF at Doherty Elementary School on June 8, 2018, in accordance with the applicable NPDES General Permit requirements. Dry weather screening is used to detect illicit discharges into the stormwater system by inspecting the stormwater outfalls/discharge points at least 48 hours after a precipitation event. A report regarding the findings of this round of dry weather screening is attached.

If you have questions regarding this report, please feel free to contact Jenna Sendra [Office - (248) 426-0165 ext. "314"; Mobile - (734) 239-1424] or Christine Caddick [Office – (248) 426-0165 ext. "316"; Mobile - (248) 792-1775].

Sincerely,

Arch Environmental Group, Inc.
Environmental Services

Lindsey Eveleth
Technician II

Attachments: Dry Weather Screening Inspection Report

cc: AE180001 project file

DRY WEATHER FIELD SCREENING REPORT

ILLICIT DISCHARGE ELIMINATION PROGRAM

Doherty Elementary School
3575 Walnut Lake Road
West Bloomfield Township, MI 48322

Prepared For:
West Bloomfield School District
3340 Orchard Lake Road
Bloomfield Hills, Michigan 48324

Prepared By:
Arch Environmental Group, Inc.
37720 Interchange Drive
Farmington Hills, Michigan 48335

Project #: AE180001-WeBSd
Project Date(s): June 8, 2018
Report Date: June 18, 2018

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1.0 Project Summary
2.0 Dry Weather Screening Inspection
3.0 Summary of Dry Weather Screening Inspection
4.0 Conclusion

Appendices

A Dry Weather Screening Inspection Logs-
Outfall/Discharge Point Locations
B Storm Sewer System Site Map

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) conducted a subsequent round of dry weather screening at discharge locations DOH-07.OP.OF, DOH-08.OP.OF, DOH-09.CB.DP, DOH-17.SCC.OF, and DOH-18.OP.OF at Doherty Elementary School on June 8, 2018, in accordance with the applicable NPDES Permit requirements. Dry weather screening is used to detect illicit discharges into the stormwater system by inspecting the stormwater outfall/discharge point (OF/DP) at least 48 hours after a precipitation event. Typically, no water flow would be present at an OF/DP after this period of time following a precipitation event. Water flow in dry weather may indicate that a substance other than stormwater is present in the stormwater system. In addition to inspecting water flow, OF/DPs are visually inspected for damage and sediment. If standing or flowing water is present, it is inspected for color, odor, and abnormal growth.

If dry weather flow is observed at the time of the inspection and the source is not obvious, the inspector who identified the discharge shall continue and conduct an upstream source investigation to determine the origin of the flow. The initial investigation includes visual and olfactory observations upstream from the OF/DP. If necessary, relevant indicator field screening or dye tracing will be conducted.

If the origin of the flow is not identified during the visual upstream investigation, a grab sample is collected from the discharge for indicator field screening analysis. Indicator monitoring/field screening is the secondary tool utilized for dry weather flow without obvious indicators such as very high turbidity, strong odors or visible discharge. Screening may include some or all of the indicator parameters:

- Temperature
- pH
- Detergents (i.e., surfactants)
- Chlorine
- Ammonia (NH_3-N)
- Turbidity
- Conductivity

Indicator parameters used to assess the dry weather flow shall be determined by the visual and olfactory observations and upstream source investigation. Additional grab samples may be collected and delivered for external laboratory analysis, only if additional test parameters are required for the source investigation.

2.0 / Dry Weather Screening Inspection

Structure ID: DOH-07.OP.OF	Structure Type: Open Pipe Outlet	Location: East of the building, southwest of the basketball court, in the woods.

Inspection Observations at DOH-07.OP.OF:

No flow or signs of an illicit discharge were observed at this location.

Structure ID: DOH-08.OP.OF	Structure Type: Open Pipe Outlet	Location: South of building, southwest of -15, inside fence.

Inspection Observations at DOH-08.OP.OF:

No flow or signs of an illicit discharge were observed at this location.

Structure ID: DOH-09.CB.DP	Structure Type: Catch Basin	Location: Northwest corner of building, in grass near door 8.

Inspection Observations at DOH-09.CB.DP:

No flow or signs of an illicit discharge were observed at this location.

Structure ID: DOH-17.SCC.OF	Structure Type: Stormwater Conveyance Channel	Location: South of stream along east property boundary line.

Inspection Observations at DOH-17.SCC.OF:

No flow or signs of an illicit discharge were observed at this location.

Structure ID: DOH-18.OP.OF	Structure Type: Open Pipe Outlet	Location: Southeast of building, south of playground, in woods.

Inspection Observations at DOH-18.OP.OF:

No flow or signs of an illicit discharge were observed at this location.

3.0/ Summary of Dry Weather Screening Inspection

AEG did not identify flow of any kind entering or leaving DOH-07.OP.OF, DOH-08.OP.OF, DOH-09.CB.DP, DOH-17.SCC.OF, and DOH-18.OP.OF during the dry weather field screening investigation at Doherty Elementary School. Additionally, the visual inspection did not identify any odors, colors, or other characteristics indicative of an illicit discharge or connection.

3.0 / Conclusion

It is the opinion of Arch Environmental Group, Inc. that the dry weather screening investigation does not indicate an unidentified illicit discharge or illicit connection at Doherty Elementary School. No further screening or inspection is suggested for this round of dry weather screening. Dry weather screening will be conducted once every five years to continue to monitor for illicit discharges in accordance with the NPDES Permit Illicit Discharge Elimination requirements.

APPENDIX A

Dry Weather Screening Inspections Logs

Screening Inspection Log

Building:	Doherty Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Lindsey Eveleth	Alec Staber	**Date**	6/8/2018
			Inspection Type:	Dry Weather Screening

Structure Information:

ID Number:	**DOH-07.OPO.OF**	Structure Type	Open Pipe Outlet	Lat:	42.55578	Long:	83.353171
Type:	Outfall	Location:	East of the building, southwest of the basketball court, in the woods				
Outfall Dimensions	12”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	No
Source of Flow:	N/A
Velocity of Flow:	N/A
Color of Flow:	N/A
Flow Odor	N/A

Maintenance

Cleaning:	No
Blockages	No
Structural Issues	Significant
Structural Trend	Stable
Stenciling:	N/A

Additional Comments:

Sample ID And Information

Sample Collected?	No
Round:	3rd Round
Last Rain Event:	>72 Hours
Current Weather:	Sun
Sample Location Type:	Open Pipe Outlet
Other Screening Activities Conducted:	No
Outfall Characterization:	
Sample sent to Lab:	

Field Analysis:	Results:	Units:	Initials:
pH:	N/A	pH units	LE/AS
Temperature:	N/A	Celsius	LE/AS
Surfactants:	N/A	mg/L	LE/AS
Ammonia:	N/A	mg/L	LE/AS
Chlorine:	N/A	mg/L	LE/AS
Turbidity:	N/A	NTU	LE/AS
Conductivity:	N/A	uohm/cm	LE/AS

Equipment Calibration:

Date: Cal. By:

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

Screening Inspection Log

Building:	Doherty Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Lindsey Eveleth	Alec Staber	**Date**	6/8/2018
			Inspection Type:	Dry Weather Screening

Structure Information:

ID Number:	**DOH-08.OPO.OF**	Structure Type	Open Pipe Outlet	Lat:	42.555469	Long:	83.345035
Type:	Outfall	Location:	South of building, southwest of 15, inside fence				
Outfall Dimensions	10”						

Observations:

Standing Water Characteristics

Standing Water:	No
Color:	N/A
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	No
Source of Flow:	N/A
Velocity of Flow:	N/A
Color of Flow:	N/A
Flow Odor	N/A

Maintenance

Cleaning:	No
Blockages	No
Structural Issues	No
Structural Trend	Stable
Stenciling:	N/A

Additional Comments:

Sample ID And Information

Sample Collected?	No
Round:	3rd Round
Last Rain Event:	>72 Hours
Current Weather:	Sun
Sample Location Type:	Open Pipe Outlet
Other Screening Activities Conducted:	No
Outfall Characterization:	
Sample sent to Lab:	

Field Analysis:	Results:	Units:	Initials:
pH:	N/A	pH units	LE/AS
Temperature:	N/A	Celsius	LE/AS
Surfactants:	N/A	mg/L	LE/AS
Ammonia:	N/A	mg/L	LE/AS
Chlorine:	N/A	mg/L	LE/AS
Turbidity:	N/A	NTU	LE/AS
Conductivity:	N/A	uohm/cm	LE/AS

Equipment Calibration:

Date:	Cal. By:

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

Screening Inspection Log

Building:	Doherty Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Lindsey Eveleth	Alec Staber	**Date**	6/8/2018
			Inspection Type:	Dry Weather Screening

Structure Information:

ID Number:	**DOH-09.CB.DP**	Structure Type	Catch Basin	Lat:	42.556612	Long:	83.354487
Type:	Discharge Point	Location:	Northwest corner of building, in grass near door 8				
Outfall Dimensions	10”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	No
Source of Flow:	N/A
Velocity of Flow:	N/A
Color of Flow:	N/A
Flow Odor	N/A

Maintenance

Cleaning:	Moderate
Blockages	No
Structural Issues	No
Structural Trend	Stable
Stenciling:	N/A

Additional Comments:

Sample ID And Information

Sample Collected?	No
Round:	3rd Round
Last Rain Event:	>72 Hours
Current Weather:	Sun
Screening Location Type:	Catch Basin
Other Screening Activities Conducted:	No
Outfall Characterization:	Unlikely
Sample sent to Lab:	

Field Analysis:	Results:	Units:	Initials:
pH:	N/A	pH units	LE/AS
Temperature:	N/A	Celsius	LE/AS
Surfactants:	N/A	mg/L	LE/AS
Ammonia:	N/A	mg/L	LE/AS
Chlorine:	N/A	mg/L	LE/AS
Turbidity:	N/A	NTU	LE/AS
Conductivity:	N/A	uohm/cm	LE/AS

Equipment Calibration:

Date:	Cal. By:

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

Screening Inspection Log

Building:	Doherty Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Lindsey Eveleth	Alec Staber	**Date**	6/8/2018
			Inspection Type:	Dry Weather Screening

Structure Information:

ID Number:	**DOH-17.SCC.OF**	Structure Type	Stormwater Conveyance Channel	Lat:	42.555118	Long:	83.352766
Type:	Outfall	Location:	South of stream along east property boundary line				
Outfall Dimensions	Sheet flow						

Observations:

Standing Water Characteristics

Standing Water:	No
Color:	N/A
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	No
Source of Flow:	N/A
Velocity of Flow:	N/A
Color of Flow:	N/A
Flow Odor	N/A

Maintenance

Cleaning:	No
Blockages	No
Structural Issues	No
Structural Trend	Stable
Stenciling:	N/A

Additional Comments:

Sample ID And Information

Sample Collected?	No
Round:	3rd Round
Last Rain Event:	>72 Hours
Current Weather:	Sun
Sample Location Type:	Stormwater Conveyance
Other Screening Activities Conducted:	No
Outfall Characterization:	Unlikely
Sample sent to Lab:	

Field Analysis:	**Results:**	**Units:**	**Initials:**
pH:	N/A	pH units	LE/AS
Temperature:	N/A	Celsius	LE/AS
Surfactants:	N/A	mg/L	LE/AS
Ammonia:	N/A	mg/L	LE/AS
Chlorine:	N/A	mg/L	LE/AS
Turbidity:	N/A	NTU	LE/AS
Conductivity:	N/A	uohm/cm	LE/AS

Equipment Calibration:

Date:	Cal. By:

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
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www.archenvgroup.com

Screening Inspection Log

Building:	Doherty Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Lindsey Eveleth	Alec Staber	**Date**	6/7/2014
			Inspection Type:	Dry Weather Screening

Structure Information:

ID Number:	**DOH-18.OPO.OF**	Structure Type	Open Pipe Outlet	Lat:	42.555698	Long:	83.353609
Type:	Outfall	Location:	Southeast of building, south of playground. In woods.				
Outfall Dimensions	12”						

Observations:

Standing Water Characteristics

Standing Water:	No
Color:	N/A
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	No
Source of Flow:	N/A
Velocity of Flow:	N/A
Color of Flow:	N/A
Flow Odor	N/A

Maintenance

Cleaning:	No
Blockages	No
Structural Issues	No
Structural Trend	Stable
Stenciling:	N/A

Additional Comments:

Sample ID And Information

Sample Collected?	No
Round:	3rd Round
Last Rain Event:	>72 Hours
Current Weather:	Sun
Sample Location Type:	Open Pipe Outlet
Other Screening Activities Conducted:	No
Outfall Characterization:	
Sample sent to Lab:	

Field Analysis:	Results:	Units:	Initials:
pH:	N/A	pH units	LE/AS
Temperature:	N/A	Celsius	LE/AS
Surfactants:	N/A	mg/L	LE/AS
Ammonia:	N/A	mg/L	LE/AS
Chlorine:	N/A	mg/L	LE/AS
Turbidity:	N/A	NTU	LE/AS
Conductivity:	N/A	uohm/cm	LE/AS

Equipment Calibration:

Date: Cal. By:

Photo ID:

Arch Environmental Group
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June 5, 2019

Mr. Ted Stinson
Supervisor of Operations & Maintenance
West Bloomfield School District
3340 Orchard Lake Rd
West Bloomfield, Michigan 48324
theodore.stinson@wbsd.org

RE: **Project # AE190001 WeBSD**
Total Maximum Daily Load (TMDL) Sampling Report
Orchard Lake Middle School

Dear Mr. Stinson:

Arch Environmental Group, Inc. recently conducted a round of TMDL Wet Weather Sampling at discharge point/outfall OLK-02.MH.DP at Orchard Lake Middle School on May 7, 2019 in accordance with the applicable NPDES Permit requirements. TMDL sampling is used to determine the level of specific pollutants in the stormwater system by collecting samples from 50% of the district's stormwater outfalls/discharge points during a representative wet weather event. The sampling results are then evaluated to determine if a particular point source needs to be addressed to reduce the pollutant load of the receiving waters. A report regarding the findings of this round of TMDL Sampling is attached.

If you have questions regarding this report, please feel free to contact please feel free to contact the cleanWATER team at (248) 426-0165.

Sincerely,

Arch Environmental Group, Inc.
Environmental Services

Carly Doulos
Technician II

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2.0 TMDL Sampling Procedures
3.0 TMDL Sampling Results
4.0 Conclusion
5.0 Best Management Practices to Reduce TMDL Pollutant Loads

Attachments:

TMDL Screening Inspection Log
Storm Sewer System Site Map
Analytical Results & Chain of Custody
Dry Weather Screening Report

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) recently conducted a round of Total Maximum Daily Load (TMDL) Sampling for E. coli at discharge location OLK-02.MH.DP at Orchard Lake Middle School on May 7, 2019, in accordance with the applicable National Pollutant Discharge Elimination System (NPDES) Permit requirements.

A TMDL describes the process used to determine how much of a pollutant a lake or stream can assimilate and sets pollutant reduction targets for that water body. NPDES Municipal Separate Storm Sewer System (MS4) permits require regulated public entities located within urbanized areas that discharge storm water to an MS4 which leads to a water body designated with a TMDL, to demonstrate progress toward meeting Water Quality Standards (WQS). If the TMDL was written for E. coli or Total Phosphorus (TP), the MS4 permits further require permittees to collect representative samples of storm water discharges from their points of discharge to MS4s which lead to the impacted water bodies.[1] Based on a review of the sampling results, Stormwater Best Management Practices (BMP) implementation will be reviewed and BMPs may be updated to ensure progress toward achieving TMDL pollutant load reductions.

Monitoring is not required for Biota/Sediment TMDLs under the MS4 permits.[2]

The receiving water body of Orchard Lake Middle School is the Franklin Branch of the Rouge River. The Rouge River has been designated with the TMDL's of E. coli and Biota/Sediment. Further details on the TMDL's listed can be found in the documents "Total Maximum Daily Load for Biota for the River Rouge Watershed" and "Total Maximum Daily Load for E. Coli for the Rouge River". Some examples of potential sources of E. coli in waterways include fecal material from livestock, humans, wildlife, waterfowl such as geese, and sanitary systems. Some examples of potential sources of sediment include erosion and construction activities.

2.0 / TMDL Sampling Procedures

Applicable TMDL sampling was conducted with guidance from the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Sampling was conducted at designated outfalls/discharge points during a rain event of approximately .25 inches or more. Please see the attached TMDL Screening Inspection Log for specific rainfall amounts. Sampling was conducted on May 7, 2019 and the last significant rain event above .25 inches was on May 1, 2019. The weather history for the rain event is available upon request.

When a dip-cup or similar sampling device was needed to collect the sample, a blank sample was collected to ensure no contamination was coming from the sampling device. The blank collected during this round of TMDL sampling came back at zero (0) CFU for E. coli that the sampling device used was not contaminated. The lab results of the blank sample are attached. Furthermore, all sampling devices were decontaminated with bleach water and distilled water between each sampling location according to the protocol laid out in the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Each location sampled was analyzed for pH and temperature while on-site and the sampled outfall/discharge point (OF/DP) was inspected for color, odor, and abnormal vegetative growth. The collected samples were delivered to an external laboratory for analysis.

[1] Storm Water Sampling Guidance for Total Phosphorus & *E. coli.* November 24, 2009. DEQ

[2] Addressing Biota TMDLs in Municipal Separate Storm Sewer System Permits" April 5, 2010. DNRE

3.0 / TMDL Sampling Results

TMDL Benchmark Standards for E. coli:

- E. coli: The WQS for E. coli is the maximum amount of E. coli that is allowable in surface waters of the state. These standards are known as total body contact and partial body contact standards. Total body contact is a more conservative standard used during the summer to protect swimmers during total body contact and has the daily maximum of 300 CFU per 100 milliliters (mL). This applies to the warmer months of May 1st -October 31stand is the standard being used in this report. Partial body contact is the daily maximum of 1,000 CFU per 100 mL and applies to the waterways year-round. [3]

Structure ID: OLK-02.MH.DP	Structure Type: Manhole	Location: East of the building, NE of OLK-01.SCC, close to the sidewalk

At the time of the sampling, clear water flow was noted, and OLK-02.MH.DP was free of odors, and abnormal vegetative growth. AEG collected a grab sample from OLK-02.MH.DP and the sample was screened for temperature and pH in the field. An E. coli grab sample was delivered to an external laboratory for analysis. Results from the sampling are summarized below. A more detailed TMDL Screening Inspection Log is also attached at the end of the report.

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8	6.5-9	pH Units
Temperature	10.8	N/A	Celsius
E. coli	1,299.7	300	CFU per 100mL

The sample results for OLK-02.MH.DP did not identify elevated levels of pH above the TMDL Benchmark Standards. However, highlighted values in the tables above indicate that for discharge location OLK-02.MH.DP the reported levels for E. coli (1,299.7 CFU) are above the Michigan Public Health Department standards for Total Body Contact (E. coli >300 CFU).

4.0 / Conclusion

AEG did not identify any elevated levels of pH above the TMDL Benchmark Standards for discharge location OLK-02.MH.DP sampled at Orchard Lake Middle School on May 7,2019. However, AEG did identify elevated levels of E. coli above the TMDL Benchmark Standards for discharge location OLK-02.MH.DP.

Arch Environmental Group, Inc. recommends that the elevated location OLK-02.MH.DP be re-assessed each permit cycle to ascertain whether greater or reduced potential for E. coli TMDL contribution has occurred. Additionally, these sites will be monitored annually during regularly scheduled BMP structural inspections for changes in conditions or site activities.

Geese, gulls and ducks are speculated to be a major bacterial source in urban areas, particularly where large populations congregate. E. coli (*Escherichia Coli)* is a sub-group of the fecal coliform group and can be used as an indicator of fecal contamination. E. coli bacteria exist in animal and human fecal matter.[4] Elevated levels of E. coli

[3] "Michigan's E. Coli Water Quality Standard Guidance" May, 2016. MDEQ

[4] Sources of E. coli In Surface Water" - Great Lakes Water Institute, University of Wisconsin, Milwaukee http://www.glwi.uwm.edu/research/genomics/ecoli/sources_of_ecoli_in_water.php

typically occur at sites which have leaking sanitary sewer systems, failed septic systems, or populations of wild or domesticated animals. E. coli originating from birds, raccoons and other wildlife may be present in large numbers in stormwater runoff. In an effort to determine the cause of the benchmark exceedance of E. coli, Arch Environmental Group reviewed the layout of the school storm water system as well as past tracer dye studies. Based on this investigation, sanitary sewer contamination from Orchard Lake Middle School is not suspected. Also, the most recent Dry Weather Screening inspection conducted on September 11, 2017 at Orchard Lake Middle School did not identify any signs of an illicit connection at this facility. The Dry Weather Screening report is attached. The source is likely natural sources, such as the presence of wild animals and their feces from the nearby stormwater conveyance channel.

5.0 / Best Management Practices to Reduce TMDL Pollutant Loads

The WeBSD Stormwater Management Plan (SWMP) identifies and defines the districts BMPs to comply with the Six Minimum Measures that are the front line in the nationwide effort to reducing polluted stormwater discharges to our lake, rivers and streams. The Michigan Department of Environmental Quality (MDEQ) recognizes that having a Stormwater Management Plan in place built around the Six Minimum Measures specified in the NPDES General Jurisdictional Permit have the potential to significantly contribute to the reduction of TMDL Pollutants in the surface waters of the state. A link to the districts current SWMP can be found on the district's website at https://www.wbsd.org/Page/3784. The Six Minimum Measures are listed below:

- Public Education and Outreach Program (PEP)
- Public Involvement and Participation Program (PIP)
- Illicit Discharge Elimination Program (IDEP)
- Post Construction Stormwater Management Program
- Construction Site Stormwater Runoff Control Program
- Pollution Prevention/Good Housekeeping Program.

The following is a list of prioritized TMDL best management practices from the districts SWMP that West Bloomfield School District should continue to implement in order to improve water quality impairments associated with the E. coli, and Biota/Sediment TMDL of the Franklin Branch of the Rouge River. Prioritization of BMPs is based on West Bloomfield School District targeted TMDL pollutants. Priority is given to BMPs that reduce E. coli and phosphorus loads and address water quality for biota.

E.COLI/BIOTA

1. WEBSD will use its website to provide the public with information regarding pet waste (SEMCOG links). Additionally, SEMCOG pet waste posters are placed at various school buildings.
2. WEBSD will prohibit illicit discharges, inspect and monitor suspected illicit discharges, and enforce elimination of the illicit discharges and connections.
3. WEBSD has reviewed all facilities for cross-connections between the sanitary and storm sewer systems.
4. WEBSD will conduct bimonthly inspections of parking lot and curb areas and hand clean as needed.
5. WEBSD has established programs for soil erosion and sediment control from new or redevelopment construction. Such developments require permits and inspections for practices to keep exposed soils on site or controlled from runoff.
6. WEBSD has implemented routine visual inspections of stormwater structural controls.

7. WEBSD will remove excessive sediments from structural sediment removal systems to maintain the maximum designed performance. Sediments will be disposed of offsite in accordance with Parts 115 or 121.

ALL TMDLs

1. WEBSD will continue to use its website to provide the public information regarding local TMDL issues (phosphorous, E.coli, and biota TMDL Best Management Practice).
2. WEBSD will continue to educate staff, faculty, and students using various venues including the **"Seven Simple Steps to Clean Water"** program educational materials developed by the various watershed groups specifically related to these issues on the stormwater management webpage.
3. The district passed a post-construction stormwater board resolution to require implementation of the stormwater standards for construction.
4. Adequately maintains vegetation around stormwater facilities, ditches, and ponds.
5. Provide training to applicable staff and confirm training from contractors including restrictions on the use of phosphorous containing fertilizers, soaps, cleaners and other chemicals that could impact the separate storm drain system.

WeBSD strives to be good stewards of the land within their jurisdiction and to use appropriate Best Management Practices (BMPs) to contribute to the improvement of water quality. WeBSD is committed to practicing sound stormwater management practices; including observance and adherence to all local, state, and federal stormwater statutes, rules, and regulations.

Attachments: TMDL Screening Inspection Log
Storm Sewer System Site Map
Analytical Results & Chain of Custody
Dry Weather Screening Report

cc: AE190001 project file

TMDL Screening Inspection Log

Building:	Orchard Lake Middle School		**Client:**	West Bloomfield School District
Samplers:	Carly Doulos	Kellie Miller	**Date**	5/7/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**OLK-02.MH.DP.TMDL**	Structure Type	Manhole	Lat:	42.550163	Long:	83.361221
Type:	Discharge Point	Location:	East of the building, NE of OLK-01.SCC, close to sidewalk				
Outfall Dimensions	48”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	OLK-01.SCC
Velocity of Flow:	Substantial
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

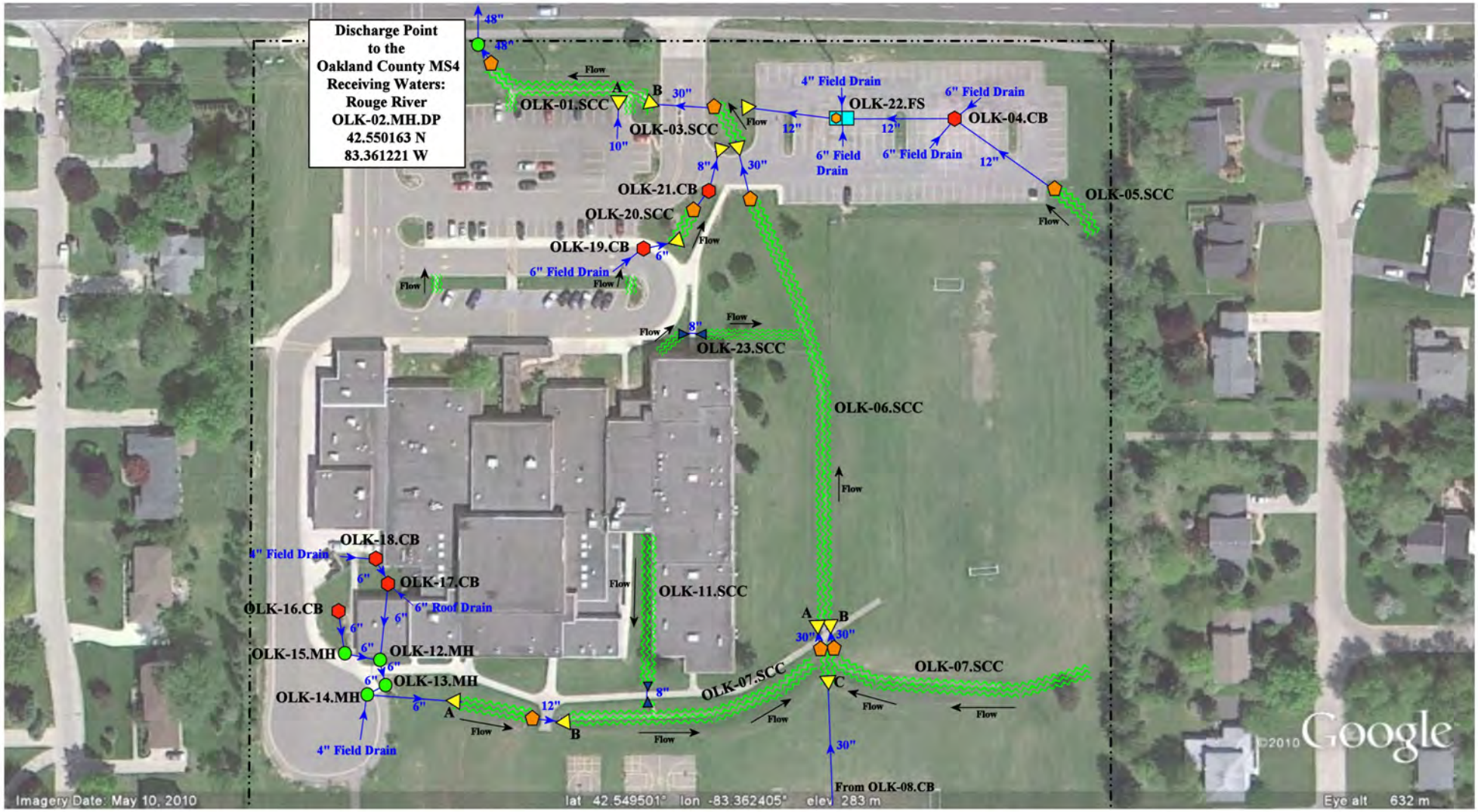
Geese and other animal feces from the grassy fields and upstream stormwater conveyance channels are a likely source of e. coli levels.

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Thres**	**Units:**
Sample ID:	OLK-02.MH.DP.TMDL	pH:	8	6.5 - 9	pH units
Time Collected:	1:00	Temperature:	10.8	N/A	Celsius
Last Rain Event:	< 48 Hours	E. coli:	1,299.70	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	N/A	N/A	ug/L
Screening Location Type:	Manhole	Other:			
Total Rainfall (Inches):	.9"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com



= Catch Basin
= Manhole
= Drainage Receptor
= Flow Splitter
= Stormwater Conveyance Channel
= Culvert
= Open Pipe Outlet
= Property Boundary

North

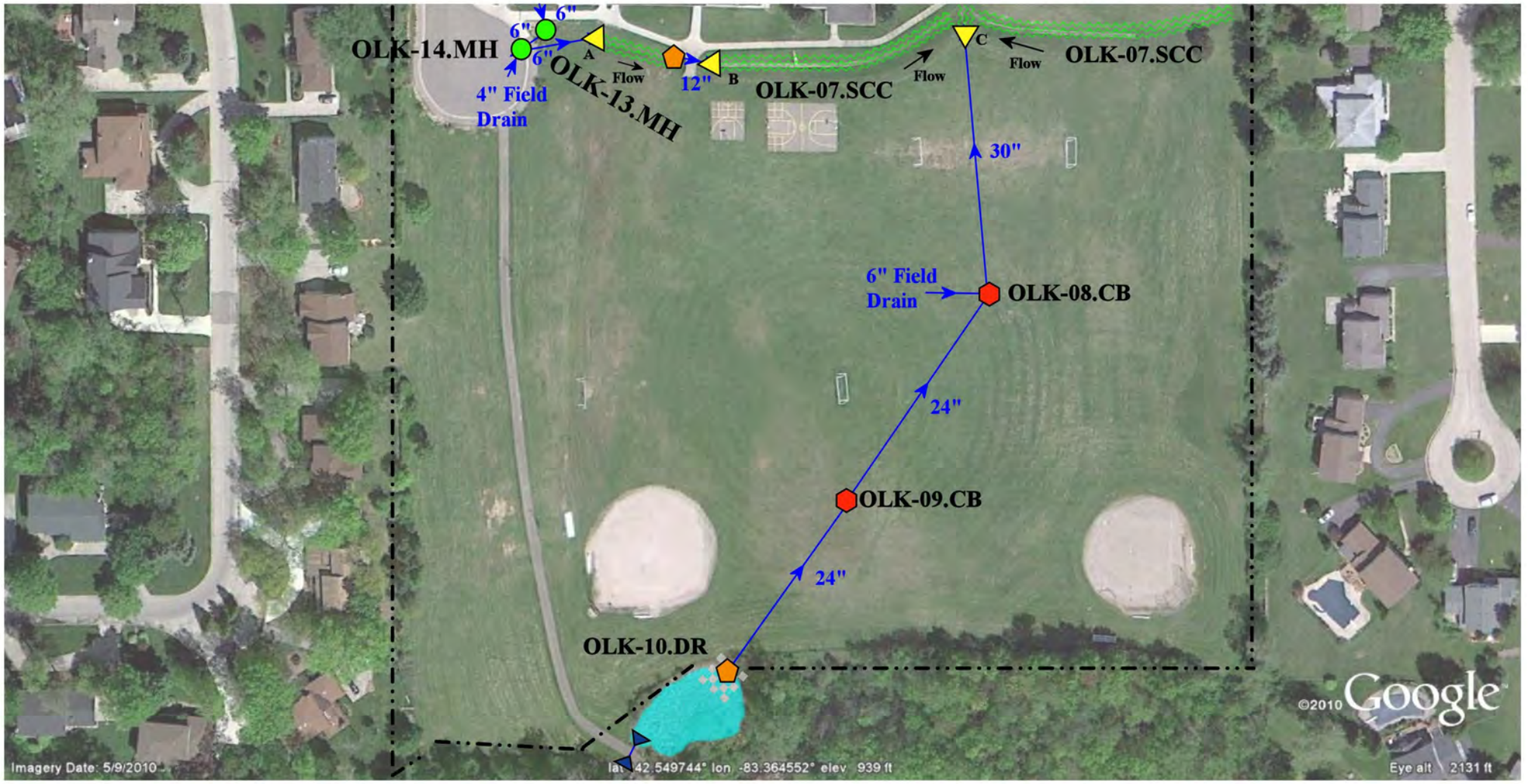
6000 Orchard Lake Road, West Bloomfield, Michigan 48322

Orchard Lake Middle School

West Bloomfield School District

environmental group
37720 Interchange Drive
Farmington Hills, MI 48335
Phone: 248-426-0165
Fax: 248-427-0305

Revision Date :	4/16/2018
Drawn by:	ACK
Reviewed:	AP
Page #:	1 of 2
Scale:	Not to Scale



6000 Orchard Lake Road, West BLoomfield, Michigan 48322

= Catch basin

= Drainage Receptor

= Open Pipe Outlet

= Stormwater Conveyance Channel

= Rip Rap

= Offsite Stormwater Wetland

= Culvert

= Property Boundary

North

Orchard Lake Middle School

West Bloomfield School District

mdh environmental group
37720 Interchange Drive
Farmington Hills, MI 48335
Phone: 248-426-0165
Fax: 248-427-0305

Revision Date :	4/16/2018
Drawn by:	ACK
Reviewed:	AP
Page #:	2 of 2
Scale:	Not to Scale

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 08, 2019

Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

Subject: Orchard Lake Middle School
AE190001-WeBSD

Dear Ms. Sendra :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/07/2019 for the above mentioned project. NELAP/TNI Accredited Analysis and MDEQ Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 57825 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57825**
BA Sample ID: **CK01089**
Project Name: **Orchard Lake Middle School**
Project Number: **AE190001-WeBSD**
Sample ID: **OLK-02.MH.DP TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**1299.7**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57826**
BA Sample ID: **CK01093**
Project Name: **Doherty Elementary School TMDL**
Project Number: **AE190001-WeBSD**
Sample ID: **Blank-TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**0**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: 57825

PROJECT NAME: Orchard Lake Middle School
PROJECT NUMBER: AE190001
P.O. NUMBER: West Bloomfield School District
Sample collected by: Kellie DaS

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab)
RUSH: 2 Business days
RUSH: 3 Business days
RUSH SURCHARGE
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Sampling Time	Sampling Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE H_2SO_4	HDPE NAOH Sterilized bacterial	AMBER GLASS	AMBER GLASS H_2SO_4	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	E. coli- CFU
1) 20-89	OLK-02.MH.DP TMDL	1:00	5-7-19							X					L	X
2)																
3)																
4)																
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

PAGE: ___ OF ___

REPORT RESULTS TO: Arch Environmental Group

Attn:
PHONE:
FAX:
EMAIL: labs@archenvgroup.com

Sample received within holding time? yes ☐ no ☐
Temperature of samples °C on ice
pH verified in login? yes ☐ no ☐
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☐
Sample containers and COC match? yes ☐ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☐
Chlorinatec Water Suppy? yes ☐ no ☐
MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1	KellieDaS	[illegible]	5.7.19	1515	3				
2					4				

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: S7826

PROJECT NAME: (48 SPACES MAXIMUM) Doherty Elementary School TMDL

PROJECT NUMBER: (25 SPACES MAXIMUM) AE190001

P.O. NUMBER: West Bloomfield Public Schools

Sample collected by: Kellie Das

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab) 1 ☐
RUSH: 2 Business days 2 ☐
RUSH: 3 Business days 3 ☐
RUSH SURCHARGE 4 ☐
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Sampling Time	Sampling Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE H_2SO_4	HDPE NAOH	AMBER GLASS	AMBER GLASS H_2SO_4	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	e.Coli CFU
1) 90	DOH-07.OP.OF TMDL	9:50	5/7/19						X						L	X
2) 91	DOH-08.OP.OF TMDL	10:05	5/7/19						X						L	X
3) 92	DOH-09.CB.DP TMDL	10:25	5/7/19						X						L	X
4) 93	Blank-TMDL	9:40	5-7-19						X						L	X
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

PAGE: ___ OF ___

REPORT RESULTS TO:
Arch Environmental Group

Attn:
PHONE:
FAX:
EMAIL: labs@archenvgroup.com

Sample received within holding time? yes ☐ no ☐
Temperature of samples °C: on ice
pH verified in login? yes ☐ no ☐
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☑
Sample containers and COC match? yes ☐ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☐
Chlorinated Water Supply? yes ☐ no ☐

MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1	Kellie Das	[signature]	5-7-19	1515	3				
2					4				

September 25, 2017

Mr. Ted Stinson
Supervisor of Facility Operations, Energy, Maintenance, and Sustainability
West Bloomfield School District
3340 Orchard Lake Road
West Bloomfield, Michigan 48324

RE: **AEG Project # AE170001 WeBSD**
Dry Weather Field Screening
Orchard Lake Middle School

Dear Mr. Stinson

Arch Environmental Group, Inc. conducted a subsequent round of dry weather screening at discharge point OLK-02.MH.DP on September 11, 2017 at the Orchard Lake Middle School in accordance with the applicable NPDES General Permit requirements. Dry weather screening is used to detect illicit discharges into the stormwater system by inspecting the stormwater outfalls/discharge points at least 48 hours after a precipitation event. A report regarding the findings of this round of dry weather screening is attached.

If you have questions regarding this report, please feel free to contact Jenna Sendra [Office - (248) 426-0165 ext. "314"; Mobile - (734) 239-1424] or Christine Caddick [Office – (248) 426-0165 ext. "316"; Mobile - (248) 792-1775].

Sincerely,

Arch Environmental Group, Inc.
Environmental Services

Andrew Kelly
Certified Industrial Site Stormwater Operator, I-14787

Attachments: Dry Weather Screening Inspection Report

cc: AE170001 project file

DRY WEATHER FIELD SCREENING REPORT ILLICIT DISCHARGE ELIMINATION PROGRAM

Orchard Lake Middle School
6000 Orchard Lake Road
West Bloomfield, Michigan 48322

Prepared For:
West Bloomfield School District
3340 Orchard Lake Road
West Bloomfield, Michigan 48324

Prepared By:
Arch Environmental Group, Inc.
37720 Interchange Drive
Farmington Hills, Michigan 48335

Project #: AE170001 WeBSD
Project Date(s): September 11, 2017
Report Date: September 25, 2017

TABLE OF CONTENTS

1.0 Project Summary
2.0 Dry Weather Screening Inspection
3.0 Summary of Dry Weather Screening Inspection
4.0 Conclusion

Appendices

A Dry Weather Screening Inspection Log(s) - Outfall/Discharge Point Locations
B Storm Sewer System Site Map

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) conducted a subsequent round of dry weather screening at discharge location OLK-02.MH.DP at Orchard Lake Middle School on September 19, 2017 in accordance with the applicable NPDES Permit requirements. Dry weather screening is used to detect illicit discharges into the stormwater system by inspecting the stormwater outfall/discharge point (OF/DP) at least 48 hours after a precipitation event. Typically, no water flow would be present at an OF/DP after this period of time following a precipitation event. Water flow in dry weather may indicate that a substance other than stormwater is present in the stormwater system. In addition to inspecting water flow, OF/DPs are visually inspected for damage and sediment. If standing or flowing water is present, it is inspected for color, odor, and abnormal growth.

If dry weather flow is observed at the time of the inspection and the source is not obvious, the inspector who identified the discharge shall continue and conduct an upstream source investigation to determine the origin of the flow. The initial investigation includes visual and olfactory observations upstream from the OF/DP. If necessary, relevant indicator field screening or dye tracing will be conducted.

If the origin of the flow is not identified during the visual upstream investigation, a grab sample is collected from the discharge for indicator field screening analysis. Indicator monitoring/field screening is the secondary tool utilized for dry weather flow without obvious indicators such as very high turbidity, strong odors or visible discharge. Screening may include some or all of the indicator parameters:

- Temperature
- pH
- Detergents (i.e., surfactants)
- Chlorine
- Ammonia (NH3-N)
- Turbidity
- Conductivity

Indicator parameters used to assess the dry weather flow shall be determined by the visual and olfactory observations and upstream source investigation. Additional grab samples may be collected and delivered for external laboratory analysis, only if additional test parameters are required for the source investigation.

2.0 / Dry Weather Screening Inspection

Structure ID:	Structure Type:	Location: East of the building, just south of the main entrance drive in the lawn.
OLK-02.MH.DP	Manhole	

Inspection Observations at OLK-02.MH.DP

No flow or signs of an illicit discharge were observed at this location.

3.0 / Summary of Dry Weather Screening Inspection

AEG did not identify flow of any kind entering or leaving OLK-02.MH.DP during the dry weather field screening investigation at Orchard Lake Middle School. Additionally, the visual inspection did not identify any odors, colors, or other characteristics indicative of an illicit discharge or connection.

4.0 / Conclusion

It is the opinion of Arch Environmental Group, Inc. that the dry weather screening investigation does not indicate an unidentified illicit discharge or illicit connection at Orchard Lake Middle School. No further screening or

inspection is suggested for this round of dry weather screening. Dry weather screening will be conducted once every five years to continue to monitor for illicit discharges in accordance with the NPDES Permit Illicit Discharge Elimination requirements.

APPENDIX A

Dry Weather Screening Inspections Logs

Screening Inspection Log

Building:	Orchard Lake Middle School		**Client:**	West Bloomfield School District
Inspectors:	Andrew Kelly	Benjamin Mark	**Date**	9/11/2017
			Inspection Type:	Dry Weather Screening

Structure Information:

ID Number:	**OLK-02.MH.DP**	Structure Type	Manhole	Lat:	42.550163	Long:	83.361221
Type:	Discharge Point	Location:	East of the building, just south of the main entrance drive in the lawn.				
Outfall Dimensions	48”						

Observations:

Standing Water Characteristics

Standing Water:	No
Color:	N/A
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	No
Source of Flow:	N/A
Velocity of Flow:	N/A
Color of Flow:	N/A
Flow Odor	N/A

Maintenance

Cleaning:	No
Blockages	No
Structural Issues	None
Structural Trend	Stable
Stenciling:	N/A

Additional Comments:

Sample ID And Information

Sample Collected?	No
Round:	1st Round
Last Rain Event:	>72 Hours
Current Weather:	Sun
Screening Location Type:	Manhole
Other Screening Activities Conducted:	No
Outfall Characterization:	Unlikely
Sample sent to Lab:	N/A

Field Analysis:	Results:	Units:	Initials:
pH:	N/A	pH units	N/A
Temperature:	N/A	Celsius	N/A
Surfactants:	N/A	mg/L	N/A
Ammonia:	N/A	mg/L	N/A
Chlorine:	N/A	mg/L	N/A
Turbidity:	N/A	NTU	N/A
Conductivity:	N/A	uohm/cm	N/A

Equipment Calibration:

Date: N/A Cal. By: N/A

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

June 12, 2019

Mr. Ted Stinson
Supervisor of Facility Operations, Maintenance, and Sustainability
West Bloomfield School District
3340 Orchard Lake Road
Bloomfield Hills, Michigan 48324
Theodore.stinson@wbsd.org

RE: **Project # AE190001 WeBSD**
Total Maximum Daily Load (TMDL) Sampling Report
Scotch Elementary School

Dear Mr. Stinson:

Arch Environmental Group, Inc. recently conducted a round of TMDL Wet Weather Sampling at discharge point/outfalls SCH-10.CB.DP and SCH-12.MH.DP at Scotch Elementary School on May 22, 2019, in accordance with the applicable NPDES Permit requirements. TMDL sampling is used to determine the level of specific pollutants in the stormwater system by collecting samples from 50% of the district's stormwater outfalls/discharge points during a representative wet weather event. The sampling results are then evaluated to determine if a particular point source needs to be addressed to reduce the pollutant load of the receiving waters. A report regarding the findings of this round of TMDL Sampling is attached.

If you have questions regarding this report, please feel free to contact please feel free to contact the cleanWATER team at (248) 426-0165.

Sincerely,

Arch Environmental Group, Inc.
Environmental Services

Kellie Das

Kellie Das
Technician II

TABLE OF CONTENTS

1.0 Project Summary
2.0 TMDL Sampling Procedures
3.0 TMDL Sampling Results
4.0 Conclusion
5.0 Best Management Practices to Reduce TMDL Pollutant Loads

Attachments:

TMDL Screening Inspection Logs
Storm Sewer System Site Map
Analytical Results & Chain of Custody

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) recently conducted a round of Total Maximum Daily Load (TMDL) Sampling for phosphorus at discharge locations SCH-10.CB.DP and SCH-12.MH.DP at Scotch Elementary School on May 22, 2019, in accordance with the applicable National Pollutant Discharge Elimination System (NPDES) Permit requirements.

A TMDL describes the process used to determine how much of a pollutant a lake or stream can assimilate and sets pollutant reduction targets for that water body. NPDES Municipal Separate Storm Sewer System (MS4) permits require regulated public entities located within urbanized areas that discharge storm water to an MS4 which leads to a water body designated with a TMDL, to demonstrate progress toward meeting Water Quality Standards (WQS). If the TMDL was written for E. coli or Total Phosphorus (TP), the MS4 permits further require permittees to collect representative samples of storm water discharges from their points of discharge to MS4s which lead to the impacted water bodies.[1] Based on a review of the sampling results, Stormwater Best Management Practices (BMP) implementation will be reviewed and BMPs may be updated to ensure progress toward achieving TMDL pollutant load reductions.

The receiving water body of Scotch Elementary School is the Hayes Creek of the Huron River. The Hayes Creek is upstream of Strawberry Lake which has been designated with a TMDL of Phosphorus. Further details on the TMDL(s) listed can be found in the document "Total Maximum Daily Load (TMDL) for Phosphorus in Strawberry Lake" Some examples of potential sources of phosphorus in waterways include the use of phosphorus containing fertilizers, manure, decomposition, and organic wastes.

2.0 / TMDL Sampling Procedures

Applicable TMDL sampling was conducted with guidance from the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Sampling was conducted at designated outfalls/discharge points after a dry period of approximately 48-72 hours and during a rain event of approximately .25 inches or more. Please see the attached TMDL Screening Inspection Logs for specific rainfall amounts. Sampling was conducted on May 22, 2019 and the last significant rain event was on May 19, 2019. The weather history for the rain event is available upon request.

When a dip-cup or similar sampling device was needed to collect the sample, a blank sample was collected to ensure no contamination was coming from the sampling device. The blank collected during this round of TMDL sampling came back at "Not Detected" for phosphorus indicating that the sampling device used was not contaminated. The lab results of the blank sample are attached. Furthermore, all sampling devices were decontaminated with distilled water between each sampling location according to the protocol laid out in the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Each location sampled was analyzed for pH and temperature while on-site and the sampled outfall/discharge point (OF/DP) was inspected for color, odor, and abnormal vegetative growth. The collected samples were delivered to an external laboratory for analysis.

3.0 / TMDL Sampling Results

<u>TMDL Benchmark Standards for Phosphorus:</u>

- Phosphorus: The WQS for phosphorus is the maximum amount of total phosphorus that is allowable in a designated waterway. Each receiving water has its own designated maximum. This means that the daily

[1] Storm Water Sampling Guidance for Total Phosphorus & *E. coli.* November 24, 2009. DEQ

maximum for one waterbody may be different from that of another waterbody. Hayes Creek is upstream of Strawberry Lake which has the designated phosphorous TMDL of 25 ug/L. [2]

Structure ID: SCH-10.CB.DP	Structure Type: Catch Basin	Location: East end of SCC by bus loop

At the time of the sampling, clear water flow was noted, and SCH-10.CB.DP was free of odors, and abnormal vegetative growth. AEG collected a grab sample from SCH-10.CB.DP and the sample was screened for temperature and pH in the field. A phosphorus grab sample was delivered to an external laboratory for analysis. Results from the sampling are summarized below. A more detailed TMDL Screening Inspection Log is also attached at the end of the report.

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8.23	6.5 - 9	pH Units
Temperature	12.3	N/A	Celsius
Total Phosphorus	41	25	ug/L

The sample results for SCH-10.CB.DP did not identify elevated levels of pH above the TMDL Benchmark Standards. However, highlighted values in the tables above indicate that for outfall location SCH-10.CB.DP, the reported levels for total phosphorus (41 ug/L) are just above Michigan Department of Environmental Quality daily maximum of 25 ug/L for Strawberry Lake.

Structure ID: SCH-12.MH.DP	Structure Type: Manhole	Location: West of bus loop on top of hill

At the time of the sampling, clear water flow was noted, and SCH-12.MH.DP was free of odors, and abnormal vegetative growth. AEG collected a grab sample from SCH-12.MH.DP and the sample was screened for temperature and pH in the field. A phosphorus grab sample was delivered to an external laboratory for analysis. Results from the sampling are summarized below. A more detailed TMDL Screening Inspection Log is also attached at the end of the report.

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8.06	6.5 - 9	pH Units
Temperature	12.3	N/A	Celsius
Total Phosphorus	Not Detected	25	ug/L

The sample results for SCH-12.MH.DP did not identify elevated levels of pH or phosphorus above the TMDL Benchmark Standards. The reported levels for total phosphorus are below the Michigan Department of Environmental Quality daily maximum of 25 ug/L for Strawberry Lake.

[2] "Total Maximum Daily Load for Phosphorus in Strawberry Lake" May 2000. MDEQ

4.0 / Conclusion

AEG did not identify any elevated levels of pH above the TMDL Benchmark Standards for discharge locations SCH-10.CB.DP and SCH-12.MH.DP sampled at Scotch Elementary School on May 22, 2019. However, AEG did identify elevated levels of phosphorus above the TMDL Benchmark Standards for discharge location SCH-10.CB.DP. AEG did not identify any elevated levels of phosphorus above the TMDL Benchmark Standards for discharge location SCH-12.MH.DP

Arch Environmental Group, Inc. recommends that the elevated location SCH-10.CB.DP be re-assessed each permit cycle to ascertain whether greater or reduced potential for phosphorus TMDL contribution has occurred. Additionally, these sites will be monitored annually during regularly scheduled Routine Storm sewer Structural Inspections for changes in conditions or site activities.

Some potential sources of phosphorus in waterways are phosphorus containing fertilizers, manure, decomposing matter (such as wildlife feces), erosion, and organic wastes.[3] Elevated levels of phosphorus typically occur at sites which have large populations of wild or domesticated animals, and/or that use phosphorus containing fertilizers. Phosphorus originating from the breakdown of other organic materials may be present in stormwater runoff as well. In an effort to determine the cause of the benchmark exceedance of phosphorus, Arch Environmental Group reviewed the layout of the school storm water system and surrounding area land use. The most recent Dry Weather Screening inspection conducted on September 11, 2017 at Scotch Elementary did not identify any signs of an illicit connection at this facility. The Dry Weather Screening report is available upon request. The surrounding land is used for residential use, as well as a close by golf course. The potential sources of phosphorus near the school are fertilizers, decomposing matter (such as wildlife feces), erosion, and organic wastes.

5.0 / Best Management Practices to Reduce TMDL Pollutant Loads

The West Bloomfield School District Stormwater Management Plan (SWMP) identifies and defines the districts BMPs to comply with the Six Minimum Measures that are the front line in the nationwide effort to reducing polluted stormwater discharges to our lake, rivers and streams. The Michigan Department of Environmental Quality (MDEQ) recognizes that having a Stormwater Management Plan in place built around the Six Minimum Measures specified in the NPDES General Jurisdictional Permit have the potential to significantly contribute to the reduction of TMDL Pollutants in the surface waters of the state. A link to the districts current SWMP can be found on the district's website at https://www.wbsd.org/Page/3784. The Six Minimum Measures are listed below:

- Public Education and Outreach Program (PEP)
- Public Involvement and Participation Program (PIP)
- Illicit Discharge Elimination Program (IDEP)
- Post Construction Stormwater Management Program
- Construction Site Stormwater Runoff Control Program
- Pollution Prevention/Good Housekeeping Program.

The following is a list of prioritized TMDL best management practices from the districts SWMP that West Bloomfield School District should continue to implement in order to improve water quality impairments associated with the Phosphorus TMDL of the Hayes Creek. Prioritization of BMPs is based on West Bloomfield School District targeted TMDL pollutants. Priority is given to BMPs that reduce E. coli and phosphorus loads and address water quality for biota and dissolved oxygen.

[3] "Phosphate in Surface Waters Streams Lakes" – Water Research Center – Brian Oram (PG) https://www.water-research.net/index.php/phosphate-in-water

PHOSPHOROUS

1. The use of Phosphorous containing fertilizers is restricted for use at all WEBSD facilities (unless soil testing indicates the necessity of adding phosphorous). In addition, all fertilizer use is restricted to athletic fields and/or areas designated as "curb appeal".
2. WEBSD will continue to use its website to provide the public information regarding pesticide use, pollution prevention, soil testing, stream buffers, and lawn fertilizers.
3. WEBSD will continue to use its website to provide the public with information on "school" carwashes.
4. WEBSD will continue to use its website to provide the public with information regarding pet waste. Additionally, SEMCOG pet waste posters are placed at various school buildings.
5. WEBSD has established programs for soil erosion and sediment control from new or redevelopment construction. Such developments require permits and inspections for practices to keep exposed soils on site or controlled from runoff. WEBSD conducts routine visual inspections of stormwater structural controls. WEBSD will remove excessive sediments from structural sediment removal systems to maintain the maximum designed performance. Sediments will be disposed of offsite in accordance with Parts 115 or 121.

ALL TMDLs

1. WEBSD will continue to use its website to provide the public information regarding local TMDL issues (phosphorous, E. coli, and biota TMDL Best Management Practice).
2. WEBSD will continue to educate staff, faculty, and students using various venues including the **"Seven Simple Steps to Clean Water"** program educational materials developed by the various watershed groups specifically related to these issues on the stormwater management webpage.
3. The district passed a post-construction stormwater board resolution to require implementation of the stormwater standards for construction.
4. Adequately maintains vegetation around stormwater facilities, ditches, and ponds.
5. Provide training to applicable staff and confirm training from contractors including restrictions on the use of phosphorous containing fertilizers, soaps, cleaners and other chemicals that could impact the separate storm drain system.

WeBSD strives to be good stewards of the land within their jurisdiction and to use appropriate Best Management Practices (BMPs) to contribute to the improvement of water quality. WeBSD is committed to practicing sound stormwater management practices; including observance and adherence to all local, state, and federal stormwater statutes, rules, and regulations.

Attachments: TMDL Screening Inspection Logs
Storm Sewer System Site Map
Analytical Results & Chain of Custody

cc: AE190001 project file

TMDL Screening Inspection Log

Building:	Scotch Elementary School		**Client:**	West Bloomfield School District
Samplers:	Kellie Das	Steven Ripley	**Date**	5/22/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**SCH-10.CB.DP**	Structure Type	Catch Basin	Lat:	42.588905	Long:	83.40034
Type:	Discharge Point	Location:	East end of SCC by bus loop				
Outfall Dimensions	8”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	Upstream structures
Velocity of Flow:	Slow
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

Phosphorus above TMDL threshold likely from decaying organic matter and potentially fertilizer.

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Threshold:**	**Units:**
Sample ID:	SCH-10.CB.DP TMDL	pH:	8.23	6.5 - 9	pH units
Time Collected:	11:25	Temperature:	12.3	N/A	Celsius
Last Rain Event:	>72 Hours	E. coli:	N/A	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	41	25	ug/L
Screening Location Type:	Catch Basin	Other:			
Total Rainfall (Inches):	0.28"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

TMDL Screening Inspection Log

Building:	Scotch Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Kellie Das	Steven Ripley	**Date**	5/22/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**SCH-12.MH.DP**	Structure Type	Manhole	Lat:	42.588614	Long:	83.400802
Type:	Discharge Point	Location:	West of bus loop on top of hill				
Outfall Dimensions	8”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	Upstream structures
Velocity of Flow:	Slow
Color of Flow:	Clear
Flow Odor	No

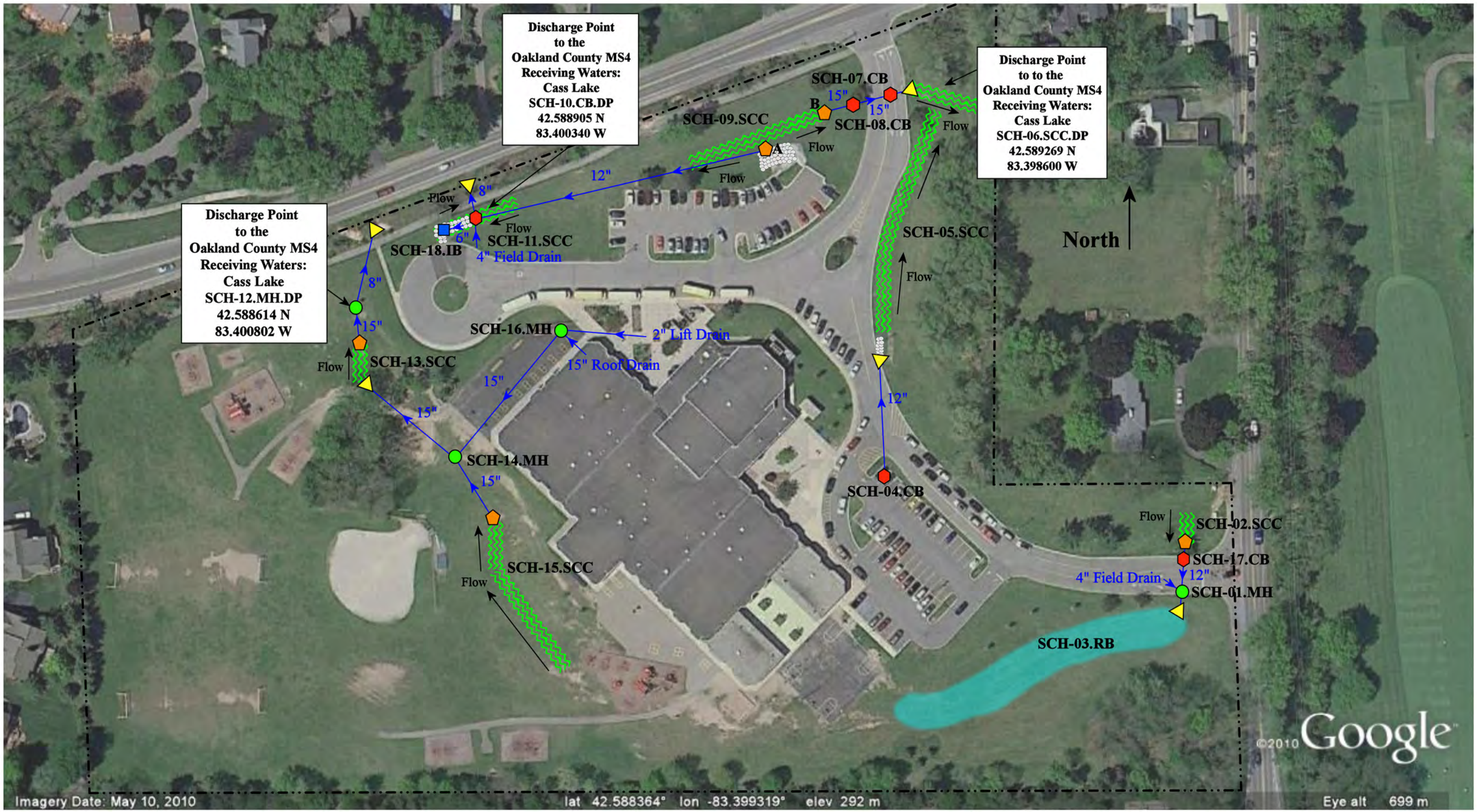
Additional Comments:

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Threshold:**	**Units:**
Sample ID:	SCH-12.MH.DP TMDL	pH:	8.06	6.5 - 9	pH units
Time Collected:	11:30	Temperature:	12.3	N/A	Celsius
Last Rain Event:	>72 Hours	E. coli:	N/A	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	ND	25 ug/L	ug/L
Sample Location Type:	Manhole	Other:			
Total Rainfall (Inches)	0.28"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com



= Catch Basin

= Open Pipe Outlet

= Drainage Receptor

= Stormwater Conveyance Channel

= Riprap

= Retention Basin

= Property Boundary

North

5959 Commerce Road, West Bloomfield, Michigan 48324

Scotch Elementary School

West Bloomfield School District

37720 Interchange Drive
Farmington Hills, MI 48335
Phone: 248-426-0165
Fax: 248-427-0305

Revision Date :	01/05/2018
Drawn by:	ACK
Reviewed:	Initials
Page #:	1 of 1
Scale:	Not to Scale

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 30, 2019

Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

Subject: Scotch Elementary - TMDL
AE190001 WeBSD

Dear Ms. Sendra :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/22/2019 for the above mentioned project. NELAP/TNI Accredited Analysis and MDEQ Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 58647 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/22/2019
Submit Date: 05/22/2019
Report Date: 05/30/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **58647**
BA Sample ID: **CK02172**
Project Name: **Scotch Elementary - TMDL**
Project Number: **AE190001 WeBSD**
Sample ID: **SCH-10 CB DP-TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Inorganic Analysis						
Phosphorus (total)	**41**	ug/L	10	SM4500 PE	MB	05/30/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/30/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/22/2019
Submit Date: 05/22/2019
Report Date: 05/30/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **58647**
BA Sample ID: **CK02173**
Project Name: **Scotch Elementary - TMDL**
Project Number: **AE190001 WeBSD**
Sample ID: **SCH-12 MH DP TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Inorganic Analysis						
Phosphorus (total)	**Not detected**	ug/L	10	SM4500 PE	MB	05/30/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/30/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/22/2019
Submit Date: 05/22/2019
Report Date: 05/30/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **58648**
BA Sample ID: **CK02174**
Project Name: **Administration Building TMDL**
Project Number: **AE190001 WeBSD**
Sample ID: **Dip Cup Blank TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Inorganic Analysis						
Phosphorus (total)	**Not detected**	ug/L	10	SM4500 PE	MB	05/30/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/30/2019

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: 58647

PAGE: 1 OF 1

PROJECT NAME: (48 SPACES MAXIMUM)	Scotch Elementary - TMDL
PROJECT NUMBER: (25 SPACES MAXIMUM)	AG190001 WCBSP
P.O. NUMBER:	West Bloomfield School District
Sample collected by:	Steven Ripley

ABBREVIATIONS FOR SAMPLE MATRIX

S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab)
RUSH: 2 Business days
RUSH: 3 Business days
RUSH SURCHARGE
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

	V
1	☐
2	☐
3	☐

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Sampling Time	Sampling Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE $H2SO_4$	HDPE NAOH	AMBER GLASS	AMBER GLASS $H2SO_4$	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	Total Phosphorus
CKO 2172	SCH-10.CB.DP-TMDL	11:25A	5/22						X						L	X
2) 73	SCH-12.MH.DP TMDL	11:30A	11						X						1	X
3)																
4)																
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

REPORT RESULTS TO: Arch Environmental Group

Attn:	
PHONE:	
FAX:	
EMAIL:	labs@archenvgroup.com

Sample received within holding time? yes ☐ no ☐ Temperature of samples °C: 4.3
pH verified in login? yes ☐ no ☐
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☐
Sample containers and COC match? yes ☐ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:

Fax to LCHD? yes ☐ no ☐
Chlorinated Water Supply? yes ☐ no ☐
MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1			5-22-19	1:00p	3				
2			5/22-19	1400	4				

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: 58648

PAGE: 1 OF 1

PROJECT NAME: (48 SPACES MAXIMUM) Administration Building TMDL

PROJECT NUMBER: (25 SPACES MAXIMUM) AE190001

P.O. NUMBER: West Bloomfield School District

Sample collected by: Kellie DaS

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab) ☐
RUSH: 2 Business days ☐
RUSH: 3 Business days ☐
RUSH SURCHARGE
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Time	Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE $H2SO_4$	HDPE NAOH	AMBER GLASS	AMBER GLASS $H2SO_4$	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	Phosphorus (Total)
1X02174	Dipcup Blank TMDL	10:36	5/22/19						X						L	X
2) 75	AMS-08.OP.OF TMDL	11:00	5/22/19						X						L	X
3) 76	AMS-02.MH TMDL	11:11	5/22/19						X						L	X
4)																
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

REPORT RESULTS TO:
Arch Environmental group

Attn:
PHONE:
FAX:
EMAIL: labs@archenvgroup.com

Sample received within holding time? yes ☑ no ☐
Temperature of samples °C 3
pH verified in login? yes ☑ no ☐
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☑
Sample containers and COC match? yes ☑ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☑
Chlorinated Water Supply? yes ☐ no ☑

MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1	Kellie DaS		5-22-19	1:00p	3				
2		5-22-19	1400		4				

Brighton Analytical L.L.C.

BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL

Accuracy & Precision

Analyst: MB **Parameter:** PHOS

Analysis Date: 5/30/2019 **Method Reference:** SM4500PE

SPIKE - ACCURACY					
Laboratory Identification	**Spike Conc. (µg/L)**	**Background (µg/L)**	**Percent Recoveries**	**Acceptable Range (%)**	**Method Blank Concentration**
CK2172	500	41	100/98	90-110	<10

SPIKE - PRECISION					
Laboratory Identification	**Observed A (µg/L)**	**Observed B (µg/L)**	**RPD**	**Acceptable Range**	
CK2172	538	529	1.69	≤ 20%	

MISCELLANEOUS			
	Standard ID #	**%Recovery**	
Independent Secondary Reference Material:	WP 270	99%	
Method Standard (Laboratory Control Spike):			

COMMENTS: _____

June 10, 2019

Mr. Ted Stinson
Supervisor of Operations and Maintenance
West Bloomfield School District
3340 Orchard Lake Road
Bloomfield Hills, Michigan 48324
Theodore.stinson@wbsd.org

RE: **Project # AE190001 WeBSD**
Total Maximum Daily Load (TMDL) Sampling Report
Sheiko Elementary

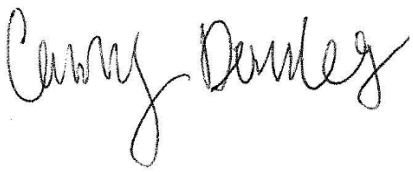
Dear Mr. Stinson:

Arch Environmental Group, Inc. recently conducted a round of TMDL Wet Weather Sampling at discharge point/outfall GRN-08.MH.DP at Sheiko Elementary on May 7, 2019 in accordance with the applicable NPDES Permit requirements. TMDL sampling is used to determine the level of specific pollutants in the stormwater system by collecting samples from 50% of the district's stormwater outfalls/discharge points during a representative wet weather event. The sampling results are then evaluated to determine if a particular point source needs to be addressed to reduce the pollutant load of the receiving waters. A report regarding the findings of this round of TMDL Sampling is attached.

If you have questions regarding this report, please feel free to contact please feel free to contact the cleanWATER team at (248) 426-0165.

Sincerely,

Arch Environmental Group, Inc.
Environmental Services



Carly Doulos
Technician II

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1.0 Project Summary
2.0 TMDL Sampling Procedures
3.0 TMDL Sampling Results
4.0 Conclusion
5.0 Best Management Practices to Reduce TMDL Pollutant Loads

Attachments:

TMDL Screening Inspection Log
Storm Sewer System Site Map
Analytical Results & Chain of Custody
Dry Weather Screening Report

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) recently conducted a round of Total Maximum Daily Load (TMDL) Sampling for E. coli at discharge location GRN-08.MH.DP at Sheiko Elementary on May 7, 2019, in accordance with the applicable National Pollutant Discharge Elimination System (NPDES) Permit requirements.

A TMDL describes the process used to determine how much of a pollutant a lake or stream can assimilate and sets pollutant reduction targets for that water body. NPDES Municipal Separate Storm Sewer System (MS4) permits require regulated public entities located within urbanized areas that discharge storm water to an MS4 which leads to a water body designated with a TMDL, to demonstrate progress toward meeting Water Quality Standards (WQS). If the TMDL was written for E. coli or Total Phosphorus (TP), the MS4 permits further require permittees to collect representative samples of storm water discharges from their points of discharge to MS4s which lead to the impacted water bodies.[1] Based on a review of the sampling results, Stormwater Best Management Practices (BMP) implementation will be reviewed and BMPs may be updated to ensure progress toward achieving TMDL pollutant load reductions.

Monitoring is not required for Biota/Sediment TMDLs under the MS4 permits.[2]

The receiving water body of Sheiko Elementary is the Franklin Branch of the Rouge River. The Franklin Branch of the Rouge River has been designated with TMDL's of E. coli and Biota/Sediment. Further details on the TMDL's listed can be found in the documents "Total Maximum Daily Load for Biota for the River Rouge Watershed**"** and "Total Maximum Daily Load for E. Coli for the Rouge River". Some examples of potential sources of E. coli in waterways include fecal material from livestock, humans, wildlife, waterfowl such as geese, and sanitary systems. Some examples of potential sources of sediment include erosion and construction activities.

2.0 / TMDL Sampling Procedures

Applicable TMDL sampling was conducted with guidance from the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Sampling was conducted at designated outfalls/discharge points during a rain event of approximately .25 inches or more. Please see the attached TMDL Screening Inspection Log for specific rainfall amounts. Sampling was conducted on May 7, 2019 and the last significant rain event above .25 inches was on May 1, 2019. The weather history for the rain event is available upon request.

When a dip-cup or similar sampling device was needed to collect the sample, a blank sample was collected to ensure no contamination was coming from the sampling device. The blank collected during this round of TMDL sampling came back at zero (0) CFU for E. coli indicating that the sampling device used was not contaminated. The lab results of the blank sample are attached. Furthermore, all sampling devices were decontaminated with bleach water distilled water between each sampling location according to the protocol laid out in the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Each location sampled was analyzed for pH and temperature while on-site and the sampled outfall/discharge point (OF/DP) was inspected for color, odor, and abnormal vegetative growth. The collected samples were delivered to an external laboratory for analysis.

[1] Storm Water Sampling Guidance for Total Phosphorus & *E. coli.* November 24, 2009. DEQ

[2] Addressing Biota TMDLs in Municipal Separate Storm Sewer System Permits" April 5, 2010. DNRE

3.0 / TMDL Sampling Results

TMDL Benchmark Standards for E. coli:

- E. coli: The WQS for E. coli is the maximum amount of E. coli that is allowable in surface waters of the state. These standards are known as total body contact and partial body contact standards. Total body contact is a more conservative standard used during the summer to protect swimmers during total body contact and has the daily maximum of 300 CFU per 100 milliliters (mL). This applies to the warmer months of May 1st -October 31stand is the standard being used in this report. Partial body contact is the daily maximum of 1,000 CFU per 100 mL and applies to the waterways year-round. [3]

Structure ID: GRN-08.MH.DP	Structure Type: Manhole	Location: Southwest of the building at the southwest corner of the property just east of the main southwest entrance drive

At the time of the sampling, clear water flow was noted, and GRN-08.MH.DP was free of odors, and abnormal vegetative growth. AEG collected a grab sample from GRN-08.MH.DP and the sample was screened for temperature and pH in the field. An E. coli grab sample was delivered to an external laboratory for analysis. Results from the sampling are summarized below. A more detailed TMDL Screening Inspection Log is also attached at the end of the report.

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	7.77	6.5 - 9	pH Units
Temperature	10.7	N/A	Celsius
E. coli	1,299.7	300	CFU per 100mL

The sample results for GRN-08.MH.DP did not identify elevated levels of pH above the TMDL Benchmark Standards. However, highlighted values in the table above indicates that for outfall location GRN-08.MH.DP, the reported levels for E. coli (1,299.7 CFU) are above the Michigan Public Health Department standards for Total Body Contact (E. coli >300 CFU).

4.0 / Conclusion

AEG did not identify any elevated levels of pH above the TMDL Benchmark Standards for discharge location GRN-08.MH.DP sampled at Sheiko Elementary on May 7, 2019. However, AEG did identify elevated levels of E. coli above the TMDL Benchmark Standards for discharge location GRN-08.MH.DP.

Arch Environmental Group, Inc. recommends that the elevated location GRN-08.MH.DP be re-assessed each permit cycle to ascertain whether greater or reduced potential for E. coli TMDL contribution has occurred. Additionally, these sites will be monitored annually during regularly scheduled BMP structural inspections for changes in conditions or site activities.

Geese, gulls and ducks are speculated to be a major bacterial source in urban areas, particularly where large populations congregate. E. coli (*Escherichia Coli)* is a sub-group of the fecal coliform group and can be used as an

[3] "Michigan's E. Coli Water Quality Standard Guidance" May, 2016. MDEQ

indicator of fecal contamination. E. coli bacteria exist in animal and human fecal matter.[4] Elevated levels of E. coli typically occur at sites which have leaking sanitary sewer systems, failed septic systems, or populations of wild or domesticated animals. E. coli originating from birds, raccoons and other wildlife may be present in large numbers in stormwater runoff. In an effort to determine the cause of the benchmark exceedance of E. coli, Arch Environmental Group reviewed the layout of the school storm water system. Based on field observations of the flow, sanitary sewer contamination from Sheiko Elementary is not suspected. The most recent Dry Weather Screening inspection conducted on September 11, 2017 at Sheiko Elementary did not identify any signs of an illicit connection at this facility. The Dry Weather Screening report is attached. The source of E. coli is likely natural sources, such as the presence of wild animals from the grassed area surrounding the manhole, and/or E. coli contamination from the 12" line coming from off-site.

5.0 / Best Management Practices to Reduce TMDL Pollutant Loads

The West Bloomfield School District Stormwater Management Plan (SWMP) identifies and defines the districts BMPs to comply with the Six Minimum Measures that are the front line in the nationwide effort to reducing polluted stormwater discharges to our lake, rivers and streams. The Michigan Department of Environmental Quality (MDEQ) recognizes that having a Stormwater Management Plan in place built around the Six Minimum Measures specified in the NPDES General Jurisdictional Permit have the potential to significantly contribute to the reduction of TMDL Pollutants in the surface waters of the state. A link to the districts current SWMP can be found on the district's website at https://www.wbsd.org/Page/3784. The Six Minimum Measures are listed below:

- Public Education and Outreach Program (PEP)
- Public Involvement and Participation Program (PIP)
- Illicit Discharge Elimination Program (IDEP)
- Post Construction Stormwater Management Program
- Construction Site Stormwater Runoff Control Program
- Pollution Prevention/Good Housekeeping Program.

The following is a list of prioritized TMDL best management practices from the districts SWMP that West Bloomfield School District should continue to implement in order to improve water quality impairments associated with the E. coli and Biota/Sediment TMDL of the Franklin Branch of the Rouge River. Prioritization of BMPs is based on West Bloomfield School District targeted TMDL pollutants. Priority is given to BMPs that reduce E. coli loads and address water quality for biota and dissolved oxygen.

E. COLI/BIOTA

1. WEBSD will use its website to provide the public with information regarding pet waste (SEMCOG links). Additionally, SEMCOG pet waste posters are placed at various school buildings.
2. WEBSD will prohibit illicit discharges, inspect and monitor suspected illicit discharges, and enforce elimination of the illicit discharges and connections.
3. WEBSD has reviewed all facilities for cross-connections between the sanitary and storm sewer systems.
4. WEBSD will conduct bimonthly inspections of parking lot and curb areas and hand clean as needed.

[4] Sources of E. coli In Surface Water" - Great Lakes Water Institute, University of Wisconsin, Milwaukee http://www.glwi.uwm.edu/research/genomics/ecoli/sources_of_ecoli_in_water.php

5. WEBSD has established programs for soil erosion and sediment control from new or redevelopment construction. Such developments require permits and inspections for practices to keep exposed soils on site or controlled from runoff.
6. WEBSD has implemented routine visual inspections of stormwater structural controls.
7. WEBSD will remove excessive sediments from structural sediment removal systems to maintain the maximum designed performance. Sediments will be disposed of offsite in accordance with Parts 115 or 121.

ALL TMDLs

1. WEBSD will continue to use its website to provide the public information regarding local TMDL issues (phosphorous, E.coli, and biota TMDL Best Management Practice).
2. WEBSD will continue to educate staff, faculty, and students using various venues including the **"Seven Simple Steps to Clean Water"** program educational materials developed by the various watershed groups specifically related to these issues on the stormwater management webpage.
3. The district passed a post-construction stormwater board resolution to require implementation of the stormwater standards for construction.
4. Adequately maintains vegetation around stormwater facilities, ditches, and ponds.
5. Provide training to applicable staff and confirm training from contractors including restrictions on the use of phosphorous containing fertilizers, soaps, cleaners and other chemicals that could impact the separate storm drain system.

WeBSD strives to be good stewards of the land within their jurisdiction and to use appropriate Best Management Practices (BMPs) to contribute to the improvement of water quality. WeBSD is committed to practicing sound stormwater management practices; including observance and adherence to all local, state, and federal stormwater statutes, rules, and regulations.

Attachments: TMDL Screening Inspection Log
Storm Sewer System Site Map
Analytical Results & Chain of Custody
Dry Weather Screening Report

cc: AE190001 project file

TMDL Screening Inspection Log

Building:	Sheiko Elementary School		**Client:**	West Bloomfield School District
Samplers:	Carly Doulos	Kellie Miller	**Date**	5/7/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**GRN-08.MH.DP**	Structure Type	Manhole	Lat:	42.557426	Long:	83.368122
Type:	Discharge Point	Location:	Southwest of the building at the southwest corner of the property just east of the main southwest entrance drive.				
Outfall Dimensions	15”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	12" line from Off-site
Velocity of Flow:	Moderate
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

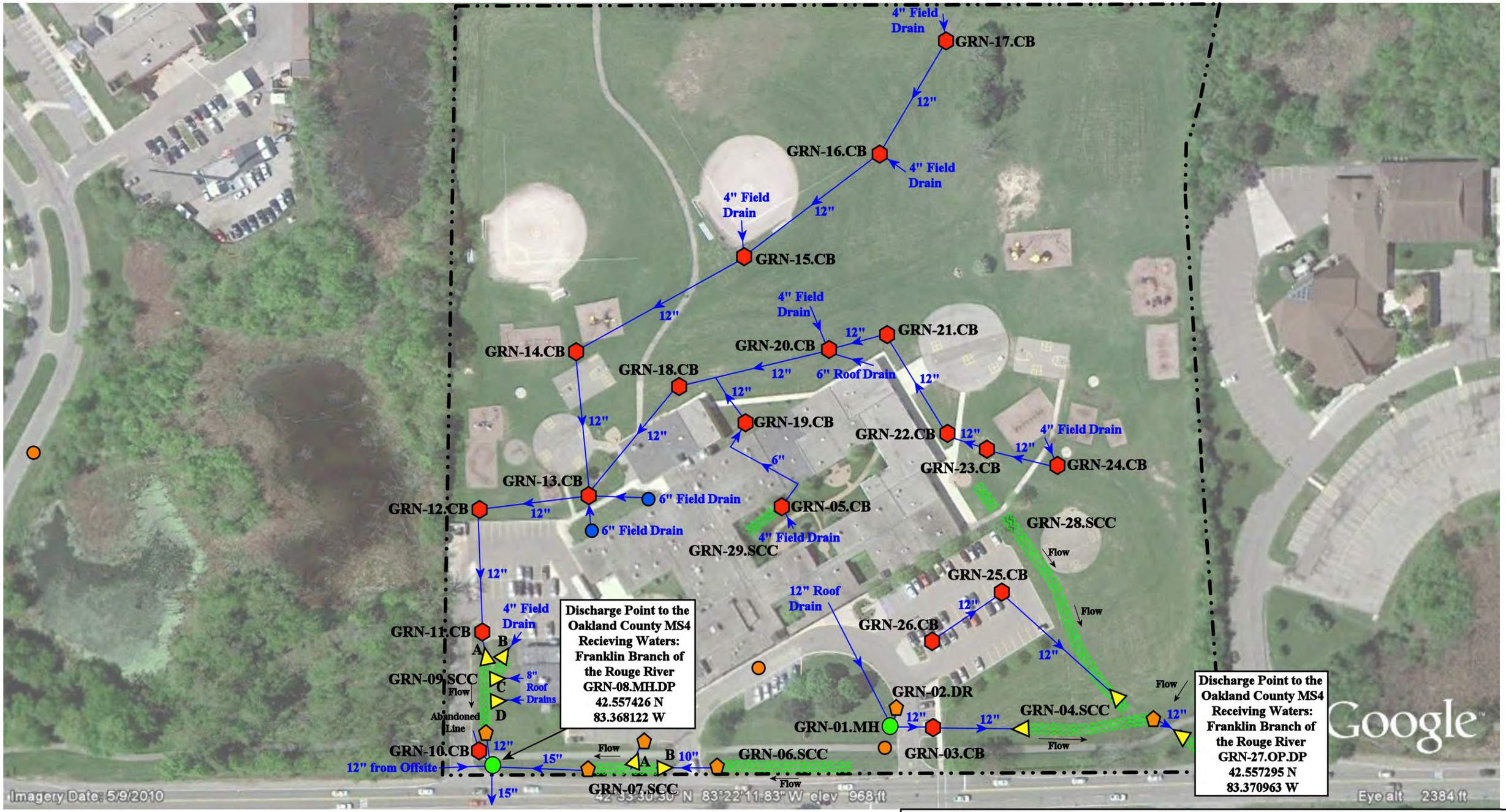
The source of E. coli is likely geese/animal feces in surrounding grassy areas. The rainwater is coming from the schools stormwater system and a 12" line that originates from off-site. The 12" line from off-site is also a potential source of E. coli.

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Threshold:**	**Units:**
Sample ID:	GRN-08.MH.DP.TMDL	pH:	7.77	6.5 - 9	pH units
Time Collected:	12:30	Temperature:	10.7	N/A	Celsius
Last Rain Event:	< 48 Hours	E. coli:	1,299.70	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	N/A	N/A	ug/L
Screening Location Type:	Manhole	Other:			
Total Rainfall (Inches):	0.9"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:					

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com



= Catch Basin
= Manhole
= Drainage Receptor
= Stormwater Conveyance Channel
= Landscape Drain
= Open Pipe Outlet
= Property Line
= Sanitary Sewer

North

4500 Walnut Lake Road, West Bloomfield Township, MI 48323

Sheiko Elementary School

West Bloomfield School District

37720 Interchange Drive
Farmington Hills, MI 48335
Phone: 248-426-0165
Fax: 248-427-0305

Revision Date:	4/10/19
Drawn by:	JP
Reviewed:	LK
Page #:	1 of 1
Scale:	Not to Scale

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 08, 2019

Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

Subject: Sheiko Elementary School-TMDL Sampling
AE190001-WeBSD

Dear Ms. Sendra :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/07/2019 for the above mentioned project. NELAP/TNI Accredited Analysis and MDEQ Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 57824 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To: Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57824**
BA Sample ID: **CK01088**
Project Name: **Sheiko Elementary School-TMDL Sampling**
Project Number: **AE190001-WeBSD**
Sample ID: **GRN-08-MH-DP TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**1299.7**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57826**
BA Sample ID: **CK01093**
Project Name: **Doherty Elementary School TMDL**
Project Number: **AE190001-WeBSD**
Sample ID: **Blank-TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**0**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: 57824

PROJECT NAME: (48 SPACES MAXIMUM): Sheito Elementary School - TMDL sampling

PROJECT NUMBER: (25 SPACES MAXIMUM): AE190001 WeBSD

P.O. NUMBER: West Bloomfield School District

Sample collected by: Kellie Das

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab)
RUSH: 2 Business days
RUSH: 3 Business days
RUSH SURCHARGE
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Sampling Time	Sampling Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE H2SO4 Sterilized Bacteria	HDPE NAOH	AMBER GLASS	AMBER GLASS H_2SO_4	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	E. coli (CFU)
1) 1088	GRN-08.MH.DP TMDL	12:30	5-7						X						L	X
2)																
3)																
4)																
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

PAGE: ___ OF ___

REPORT RESULTS TO:
Arch Environmental Group

Attn:

PHONE: 248-426-0165

FAX:

EMAIL: labs@archenvgroup.com

Sample received within holding time? yes ☑ no ☐
Temperature of samples °C: Unk
pH verified in login? yes ☐ no ☑
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☑
Sample containers and COC match? yes ☑ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☐
Chlorinated Water Supply? yes ☐ no ☐

MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1			5-7-19	1515	3				
2					4				

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: S7826

PROJECT NAME: (48 SPACES MAXIMUM) Doherty Elementary School TMDL

PROJECT NUMBER: (25 SPACES MAXIMUM) AE190001

P.O. NUMBER: West Bloomfield Public Schools

Sample collected by: Kellie Das

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab) 1 ☐
RUSH: 2 Business days 2 ☐
RUSH: 3 Business days 3 ☐
RUSH SURCHARGE 4 ☐
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Sampling Time	Sampling Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE H_2SO_4	HDPE NAOH	AMBER GLASS	AMBER GLASS H_2SO_4	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	e.Coli CFU
1) 90	DOH-07.OP.OF TMDL	9:50	5/7/19						X						L	X
2) 91	DOH-08.OP.OF TMDL	10:05	5/7/19						X						L	X
3) 92	DOH-09.CB.DP TMDL	10:25	5/7/19						X						L	X
4) 93	Blank-TMDL	9:40	5-7-19						X						L	X
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

PAGE: ___ OF ___

REPORT RESULTS TO:
Arch Environmental Group

Attn:
PHONE:
FAX:
EMAIL: labs@archenvgroup.com

Sample received within holding time? yes ☐ no ☐
Temperature of samples °C: on ice
pH verified in login? yes ☐ no ☐
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☑
Sample containers and COC match? yes ☐ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☐
Chlorinated Water Supply? yes ☐ no ☐

MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1	Kellie Das	[signature]	5-7-19	1515	3				
2					4				

September 27, 2017

Mr. Ted Stinson
Supervisor of Facility Operations
West Bloomfield School District
3340 Orchard Lake Road
West Bloomfield, Michigan 48324
Theodore.stinson@wbsd.org

RE: **AEG Project # AE170001 WeBSD**
Dry Weather Field Screening
Sheiko Elementary School

Dear Mr. Stinson:

Arch Environmental Group, Inc. conducted a subsequent round of dry weather screening at discharge point/outfalls GRN-08.MH.DP and GRN-27.OP.DP at Sheiko Elementary School on September 11, 2017, in accordance with the applicable NPDES General Permit requirements. Dry weather screening is used to detect illicit discharges into the stormwater system by inspecting the stormwater outfalls/discharge points at least 48 hours after a precipitation event. A report regarding the findings of this round of dry weather screening is attached.

If you have questions regarding this report, please feel free to contact Jenna Sendra [Office - (248) 426-0165 ext. "314"; Mobile - (734) 239-1424] or Christine Caddick [Office – (248) 426-0165 ext. "316"; Mobile - (248) 792-1775].

Sincerely,

Arch Environmental Group, Inc.
Environmental Services

Andrew Kelly
Certified Industrial Site Stormwater Operator, I-14787

Attachments: Dry Weather Screening Inspection Report

cc: AE170001 project file

DRY WEATHER FIELD SCREENING REPORT ILLICIT DISCHARGE ELIMINATION PROGRAM

Sheiko Elementary School
4500 Walnut Lake Road
West Bloomfield Township, Michigan 48323

Prepared For:
West Bloomfield School District
3340 Orchard Lake Road
West Bloomfield, Michigan 48324

Prepared By:
Arch Environmental Group, Inc.
37720 Interchange Drive
Farmington Hills, Michigan 48335

Project #:	AE170001 WeBSD
Project Date(s):	September 11, 2017
Report Date:	September 27, 2017

TABLE OF CONTENTS

1.0 Project Summary
2.0 Dry Weather Screening Inspection
3.0 Summary of Dry Weather Screening Inspection
4.0 Conclusion

Appendices

A Dry Weather Screening Inspection Log(s) - Outfall/Discharge Point Locations
B Storm Sewer System Site Map

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) conducted a subsequent round of dry weather screening at discharge locations GRN-08.MH.DP and GRN-27.OP.DP at Sheiko Elementary School on September 11, 2017, in accordance with the applicable NPDES Permit requirements. Dry weather screening is used to detect illicit discharges into the stormwater system by inspecting the stormwater outfall/discharge point (OF/DP) at least 48 hours after a precipitation event. Typically, no water flow would be present at an OF/DP after this period of time following a precipitation event. Water flow in dry weather may indicate that a substance other than stormwater is present in the stormwater system. In addition to inspecting water flow, OF/DPs are visually inspected for damage and sediment. If standing or flowing water is present, it is inspected for color, odor, and abnormal growth.

If dry weather flow is observed at the time of the inspection and the source is not obvious, the inspector who identified the discharge shall continue and conduct an upstream source investigation to determine the origin of the flow. The initial investigation includes visual and olfactory observations upstream from the OF/DP. If necessary, relevant indicator field screening or dye tracing will be conducted.

If the origin of the flow is not identified during the visual upstream investigation, a grab sample is collected from the discharge for indicator field screening analysis. Indicator monitoring/field screening is the secondary tool utilized for dry weather flow without obvious indicators such as very high turbidity, strong odors or visible discharge. Screening may include some or all of the indicator parameters:

- Temperature
- pH
- Detergents (i.e., surfactants)
- Chlorine
- Ammonia (NH3-N)
- Turbidity
- Conductivity

Indicator parameters used to assess the dry weather flow shall be determined by the visual and olfactory observations and upstream source investigation. Additional grab samples may be collected and delivered for external laboratory analysis, only if additional test parameters are required for the source investigation.

2.0 / Dry Weather Screening Inspection

Structure ID:	Structure Type:	Location:
GRN-08.MH.DP	Manhole	Southwest of the building at the southwest corner of the property just east of the main southwest entrance drive.

Inspection Observations at GRN-27.OP.DP

At the time of the inspection, clear water flow was observed at GRN-08.MH.DP, entering from the 12” concrete pipe from the west from offsite. The discharge point (DP) discharges from a 15” metal pipe to the Oakland County MS4. Clear standing water was noted during the inspection, and the DP was free of odors and blockages. The structure of the DP was observed in good condition. A grab sample was not collected at the time of the inspection as the source of the flow is offsite and not indicative of an illicit discharge or an illicit connection originating from onsite.

Structure ID: GRN-27.OP.DP	Structure Type: Open Pipe Outlet	Location: Southeast of the building at the southeast end of the property just east of the sidewalk.

Inspection Observations at GRN-27.OP.DP

No flow or signs of an illicit discharge were observed at this location.

3.0 / Summary of Dry Weather Screening Inspection

AEG did not identify flow of any kind entering or leaving GRN-27.OP.DP during the dry weather field screening investigation at Sheiko Elementary School. AEG did identify flow entering and leaving GRN-08.MH.DP, however, the source of the flow was a 12" concrete pipe from offsite. Additionally, the visual inspection did not identify any odors, colors, or other characteristics indicative of an illicit discharge or connection.

4.0 / Conclusion

It is the opinion of Arch Environmental Group, Inc. that the dry weather screening investigation and upstream investigation do not indicate an unidentified illicit discharge or illicit connection at Sheiko Elementary School. No further screening or inspection is suggested for this round of dry weather screening. Dry weather screening will be conducted once every five years to continue to monitor for illicit discharges in accordance with the NPDES Permit Illicit Discharge Elimination requirements.

APPENDIX A

Dry Weather Screening Inspections Logs

Screening Inspection Log

Building:	Sheiko Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Andrew Kelly	Benjamin Mark	**Date**	9/11/2017
			Inspection Type:	Dry Weather Screening

Structure Information:

ID Number:	**GRN-08.MH.DP**	Structure Type	Manhole	Lat:	42.557426	Long:	83.368122
Type:	Discharge Point	Location:	Southwest of the building at the southwest corner of the property just east of the main southwest entrance drive.				
Outfall Dimensions	15”						

Observations:

Standing Water Characteristics

Standing Water:	No
Color:	N/A
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	Offsite 12”
Velocity of Flow:	Trickle
Color of Flow:	Clear
Flow Odor	No

Maintenance

Cleaning:	No
Blockages	No
Structural Issues	None
Structural Trend	Stable
Stenciling:	Update

Additional Comments:

Flow observed entering the manhole from offsite and discharging from the discharge pipe - no sign of illicit discharge or connection originating from the Sheiko Elementary School property.

Sample ID And Information

Sample Collected?	No
Round:	1st Round
Last Rain Event:	>72 Hours
Current Weather:	Sun
Screening Location Type:	Manhole
Other Screening Activities Conducted:	No
Outfall Characterization:	Unlikely
Sample sent to Lab:	No

Field Analysis:	Results:	Units:	Initials:
pH:	N/A	pH units	N/A
Temperature:	N/A	Celsius	N/A
Surfactants:	N/A	mg/L	N/A
Ammonia:	N/A	mg/L	N/A
Chlorine:	N/A	mg/L	N/A
Turbidity:	N/A	NTU	N/A
Conductivity:	N/A	uohm/cm	N/A

Equipment Calibration:

Date: N/A Cal. By: N/A

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

Screening Inspection Log

Building:	Sheiko Elementary School		**Client:**	West Bloomfield School District
Inspectors:	Andrew Kelly	Benjamin Mark	**Date**	9/11/2017
			Inspection Type:	Dry Weather Screening

Structure Information:

ID Number:	**GRN-27.OP.DP**	Structure Type	Open Pipe Outlet	Lat:	42.557295	Long: 83.370963
Type:	Discharge Point	Location:	Southeast of the building at the southeast end of the property just east of the sidewalk.			
Outfall Dimensions	12”					

Observations:

Standing Water Characteristics

Standing Water:	No
Color:	N/A
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	No
Source of Flow:	N/A
Velocity of Flow:	N/A
Color of Flow:	N/A
Flow Odor	N/A

Maintenance

Cleaning:	Significant
Blockages	No
Structural Issues	None
Structural Trend	Stable
Stenciling:	N/A

Additional Comments:

Sample ID And Information

Sample Collected?	No
Round:	1st Round
Last Rain Event:	>72 Hours
Current Weather:	Sun
Sample Location Type:	Open Pipe Outlet
Other Screening Activities Conducted:	No
Outfall Characterization:	Unlikely
Sample sent to Lab:	No

Field Analysis:	Results:	Units:	Initials:
pH:	N/A	pH units	N/A
Temperature:	N/A	Celsius	N/A
Surfactants:	N/A	mg/L	N/A
Ammonia:	N/A	mg/L	N/A
Chlorine:	N/A	mg/L	N/A
Turbidity:	N/A	NTU	N/A
Conductivity:	N/A	uohm/cm	N/A

Equipment Calibration:

Date: N/A Cal. By: N/A

Photo ID:

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

June 10, 2019

Mr. Ted Stinson
Supervisor of Operations and Maintenance
West Bloomfield School District
3340 Orchard Lake Road
Bloomfield Hills, Michigan 48324
Theodore.stinson@wbsd.org

RE: **Project # AE190001 WeBSD**
Total Maximum Daily Load (TMDL) Sampling Report
West Bloomfield High School

Dear Mr. Stinson:

Arch Environmental Group, Inc. recently conducted a round of TMDL Wet Weather Sampling at discharge point/outfall WTB-53.OP.OF and WTB-54.OP.OF at West Bloomfield High School on May 7, 2019 in accordance with the applicable NPDES Permit requirements. TMDL sampling is used to determine the level of specific pollutants in the stormwater system by collecting samples from 50% of the district's stormwater outfalls/discharge points during a representative wet weather event. The sampling results are then evaluated to determine if a particular point source needs to be addressed to reduce the pollutant load of the receiving waters. A report regarding the findings of this round of TMDL Sampling is attached.

If you have questions regarding this report, please feel free to contact please feel free to contact the cleanWATER team at (248) 426-0165.

Sincerely,

Arch Environmental Group, Inc.
Environmental Services

Carly Doulos
Technician II

TABLE OF CONTENTS

1.0 Project Summary
2.0 TMDL Sampling Procedures
3.0 TMDL Sampling Results
4.0 Conclusion
5.0 Best Management Practices to Reduce TMDL Pollutant Loads

Attachments:

TMDL Screening Inspection Log
Storm Sewer System Site Map
Analytical Results & Chain of Custody

1.0 / Project Summary

Arch Environmental Group, Inc. (AEG) recently conducted a round of Total Maximum Daily Load (TMDL) Sampling for E. coli at discharge location WTB-53.OP.OF and WTB-54.OP at West Bloomfield High School on May 7, 2019, in accordance with the applicable National Pollutant Discharge Elimination System (NPDES) Permit requirements.

A TMDL describes the process used to determine how much of a pollutant a lake or stream can assimilate and sets pollutant reduction targets for that water body. NPDES Municipal Separate Storm Sewer System (MS4) permits require regulated public entities located within urbanized areas that discharge storm water to an MS4 which leads to a water body designated with a TMDL, to demonstrate progress toward meeting Water Quality Standards (WQS). If the TMDL was written for E. coli or Total Phosphorus (TP), the MS4 permits further require permittees to collect representative samples of storm water discharges from their points of discharge to MS4s which lead to the impacted water bodies.[1] Based on a review of the sampling results, Stormwater Best Management Practices (BMP) implementation will be reviewed and BMPs may be updated to ensure progress toward achieving TMDL pollutant load reductions.

Monitoring is not required for Biota/Sediment TMDLs under the MS4 permits.[2]

The receiving water body of West Bloomfield High School is the Franklin Branch of the Rouge River. The Franklin Branch of the Rouge River has been designated with TMDL's of E. coli and Biota/Sediment. Further details on the TMDL's listed can be found in the documents "Total Maximum Daily Load for Biota for the River Rouge Watershed**"** and "Total Maximum Daily Load for E. Coli for the Rouge River". Some examples of potential sources of E. coli in waterways include fecal material from livestock, humans, wildlife, waterfowl such as geese, and sanitary systems. Some examples of potential sources of sediment include erosion and construction activities.

2.0 / TMDL Sampling Procedures

Applicable TMDL sampling was conducted with guidance from the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Sampling was conducted at designated outfalls/discharge points during a rain event of approximately .25 inches or more. Please see the attached TMDL Screening Inspection Log for specific rainfall amounts. Sampling was conducted on May 7, 2019 and the last significant rain event above .25 inches was on May 1, 2019. The weather history for the rain event is available upon request.

When a dip-cup or similar sampling device was needed to collect the sample, a blank sample was collected to ensure no contamination was coming from the sampling device. The blank collected during this round of TMDL sampling came back at zero (0) CFU for E. coli indicating that the sampling device used was not contaminated. The lab results of the blank sample are attached. Furthermore, all sampling devices were decontaminated with bleach water distilled water between each sampling location according to the protocol laid out in the "Storm Water Sampling Guidance for Total Phosphorus & E. coli." Each location sampled was analyzed for pH and temperature while on-site and the sampled outfall/discharge point (OF/DP) was inspected for color, odor, and abnormal vegetative growth. The collected samples were delivered to an external laboratory for analysis.

[1] Storm Water Sampling Guidance for Total Phosphorus & *E. coli.* November 24, 2009. DEQ

[2] Addressing Biota TMDLs in Municipal Separate Storm Sewer System Permits" April 5, 2010. DNRE

3.0 / TMDL Sampling Results

TMDL Benchmark Standards for E. coli:

- E. coli: The WQS for E. coli is the maximum amount of E. coli that is allowable in surface waters of the state. These standards are known as total body contact and partial body contact standards. Total body contact is a more conservative standard used during the summer to protect swimmers during total body contact and has the daily maximum of 300 CFU per 100 milliliters (mL). This applies to the warmer months of May 1st -October 31stand is the standard being used in this report. Partial body contact is the daily maximum of 1,000 CFU per 100 mL and applies to the waterways year-round. [3]

Structure ID: WTB-53.OP.OF	**Structure Type: Open Pipe**	**Location: East of the building, east of the baseball field, off of the nature trail**
Structure ID: WTB-54.OP.OF	**Structure Type: Open Pipe**	**Location: East of the building, east of the baseball field, off of the nature trail**

At the time of the sampling, clear water flow was noted, and WTB-53.OP.OF and WTB-54.OP were free of odors, and abnormal vegetative growth. AEG collected grab samples WTB-53.OP.OF and WTB-54.OP and the sample was screened for temperature and pH in the field. An E. coli grab sample was delivered to an external laboratory for analysis. Results from the sampling are summarized below. A more detailed TMDL Screening Inspection Log is also attached at the end of the report.

WTB-53.OP.OF

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	7.81	6.5 - 9	pH Units
Temperature	10	N/A	Celsius
E. coli	0	300	CFU per 100mL

WTB-54.OP.OF

Parameter:	Results:	TMDL Benchmark Standard:	Units:
pH	8.5	6.5 - 9	pH Units
Temperature	10.5	N/A	Celsius
E. coli	218.7	300	CFU per 100mL

The sample results for WTB-53.OP.OF and WTB-54.OP did not identify elevated levels of pH or E. coli above the TMDL Benchmark Standards. The reported levels for E. coli (0 and 218.7 CFU) are below the Michigan Public Health Department standards for Total Body Contact (E. coli >300 CFU).

4.0 / Conclusion

AEG did not identify any elevated levels of pH or E. coli above the TMDL Benchmark Standards for discharge locations WTB-53.OP.OF and WTB-54.OP sampled at West Bloomfield High School on May 7, 2019.

[3] "Michigan's E. Coli Water Quality Standard Guidance" May, 2016. MDEQ

It is the opinion of Arch Environmental Group, Inc. that the TMDL sampling results indicate good use of BMPs in maintaining TMDL pollutant load reductions at West Bloomfield High School. A list of those BMPs is provided below in section 5.0. TMDL sampling will be conducted twice per permit cycle to continue to monitor for TMDL pollutant load levels in accordance with the NPDES Permit requirements.

5.0 / Best Management Practices to Reduce TMDL Pollutant Loads

The West Bloomfield School District Stormwater Management Plan (SWMP) identifies and defines the districts BMPs to comply with the Six Minimum Measures that are the front line in the nationwide effort to reducing polluted stormwater discharges to our lake, rivers and streams. The Michigan Department of Environmental Quality (MDEQ) recognizes that having a Stormwater Management Plan in place built around the Six Minimum Measures specified in the NPDES General Jurisdictional Permit have the potential to significantly contribute to the reduction of TMDL Pollutants in the surface waters of the state. A link to the districts current SWMP can be found on the districts website at https://www.wbsd.org/Page/3784. The Six Minimum Measures are listed below:

- Public Education and Outreach Program (PEP)
- Public Involvement and Participation Program (PIP)
- Illicit Discharge Elimination Program (IDEP)
- Post Construction Stormwater Management Program
- Construction Site Stormwater Runoff Control Program
- Pollution Prevention/Good Housekeeping Program.

The following is a list of prioritized TMDL best management practices from the districts SWMP that West Bloomfield School District should continue to implement in order to improve water quality impairments associated with the E. coli and Biota/Sediment TMDL of the Franklin Branch of the Rouge River. Prioritization of BMPs is based on West Bloomfield School District targeted TMDL pollutants. Priority is given to BMPs that reduce E. coli loads and address water quality for biota and dissolved oxygen.

E. COLI/BIOTA

1. WEBSD will use its website to provide the public with information regarding pet waste (SEMCOG links). Additionally, SEMCOG pet waste posters are placed at various school buildings.
2. WEBSD will prohibit illicit discharges, inspect and monitor suspected illicit discharges, and enforce elimination of the illicit discharges and connections.
3. WEBSD has reviewed all facilities for cross-connections between the sanitary and storm sewer systems.
4. WEBSD will conduct bimonthly inspections of parking lot and curb areas and hand clean as needed.
5. WEBSD has established programs for soil erosion and sediment control from new or redevelopment construction. Such developments require permits and inspections for practices to keep exposed soils on site or controlled from runoff.
6. WEBSD has implemented routine visual inspections of stormwater structural controls.
7. WEBSD will remove excessive sediments from structural sediment removal systems to maintain the maximum designed performance. Sediments will be disposed of offsite in accordance with Parts 115 or 121.

ALL TMDLs

1. WEBSD will continue to use its website to provide the public information regarding local TMDL issues (phosphorous, E.coli, and biota TMDL Best Management Practice).

2. WEBSD will continue to educate staff, faculty, and students using various venues including the **"Seven Simple Steps to Clean Water"** program educational materials developed by the various watershed groups specifically related to these issues on the stormwater management webpage.
3. The district passed a post-construction stormwater board resolution to require implementation of the stormwater standards for construction.
4. Adequately maintains vegetation around stormwater facilities, ditches, and ponds.
5. Provide training to applicable staff and confirm training from contractors including restrictions on the use of phosphorous containing fertilizers, soaps, cleaners and other chemicals that could impact the separate storm drain system.

WeBSD strives to be good stewards of the land within their jurisdiction and to use appropriate Best Management Practices (BMPs) to contribute to the improvement of water quality. WeBSD is committed to practicing sound stormwater management practices; including observance and adherence to all local, state, and federal stormwater statutes, rules, and regulations.

Attachments: TMDL Screening Inspection Log
Storm Sewer System Site Map
Analytical Results & Chain of Custody

cc: AE190001 project file

TMDL Screening Inspection Log

Building:	West Bloomfield High School		**Client:**	West Bloomfield School District
Samplers:	Carly Doulos	Kellie Miller	**Date**	5/7/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**WTB-53.OP.OF**	Structure Type	Open Pipe Outlet	Lat:	42.568199	Long:	83.358095
Type:	Outfall	Location:	East of the building, east of the baseball field, off of the nature trail				
Outfall Dimensions	24”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	WTB-25.CB, rainfall
Velocity of Flow:	Moderate
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Threshold:**	**Units:**	**Photo ID:**
Sample ID:	WTB-53.OP.OF.TMDL	pH:	7.81	6.5 - 9	pH units	
Time Collected:	11:25	Temperature:	10	N/A	Celsius	
Last Rain Event:	< 48 Hours	E. coli:	0	300	CFU per 100mL	
Current Weather:	Rain	Total Phosphorus:	N/A			
Screening Location Type:	Open Pipe Outlet	Other:				
Total Rainfall (Inches):	0.9"	Other:				
		Other:				
Outfall Characterization:	Unlikely					
Sample sent to Lab:	Yes					

Arch Environmental Group
37720 Interchange Drive,
Farmington Hills MI 48370

Phone: (248) 426-0135
Fax: (248) 426-0136
www.archenvgroup.com

TMDL Screening Inspection Log

Building:	West Bloomfield High School		**Client:**	West Bloomfield School District
Inspectors:	Carly Doulos	Kellie Miller	**Date**	5/7/2019
			Inspection Type:	TMDL Sampling

Structure Information:

ID Number:	**WTB-54.OP.OF**	Structure Type	Open Pipe Outlet	Lat:	42.568318	Long:	83.358225
Type:	Outfall	Location:	East of the building, east of the baseball field, off of the nature trail				
Outfall Dimensions	48”						

Observations:

Standing Water Characteristics

Standing Water:	Yes
Color:	Clear
Odor:	No
Suds:	No
Staining:	No
Oil Sheen:	No
Sewage:	No
Bacterial Sheen:	No
Algae:	No
Slimes:	No
Abnormal Growth:	No

Flow Characteristics

Flow Observed:	Yes, Continous
Source of Flow:	WTB-30.CB
Velocity of Flow:	Substantial
Color of Flow:	Clear
Flow Odor	No

Additional Comments:

Near baseball field, birds present.

Sample ID And Information		**Lab Analysis:**	**Results:**	**TMDL Threshold:**	**Units:**
Sample ID:	WTB-54.OP.OF.TMDL	pH:	8.5	6.5 - 9	pH units
Time Collected:	11:30	Temperature:	10.5	N/A	Celsius
Last Rain Event:	< 48 Hours	E. coli:	218.7	300	CFU per 100mL
Current Weather:	Rain	Total Phosphorus:	N/A		
Sample Location Type:	Open Pipe Outlet	Other:			
Total Rainfall (Inches)	0.9"	Other:			
		Other:			
Outfall Characterization:	Unlikely				
Sample sent to Lab:	Yes				

Photo ID:

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Farmington Hills MI 48370

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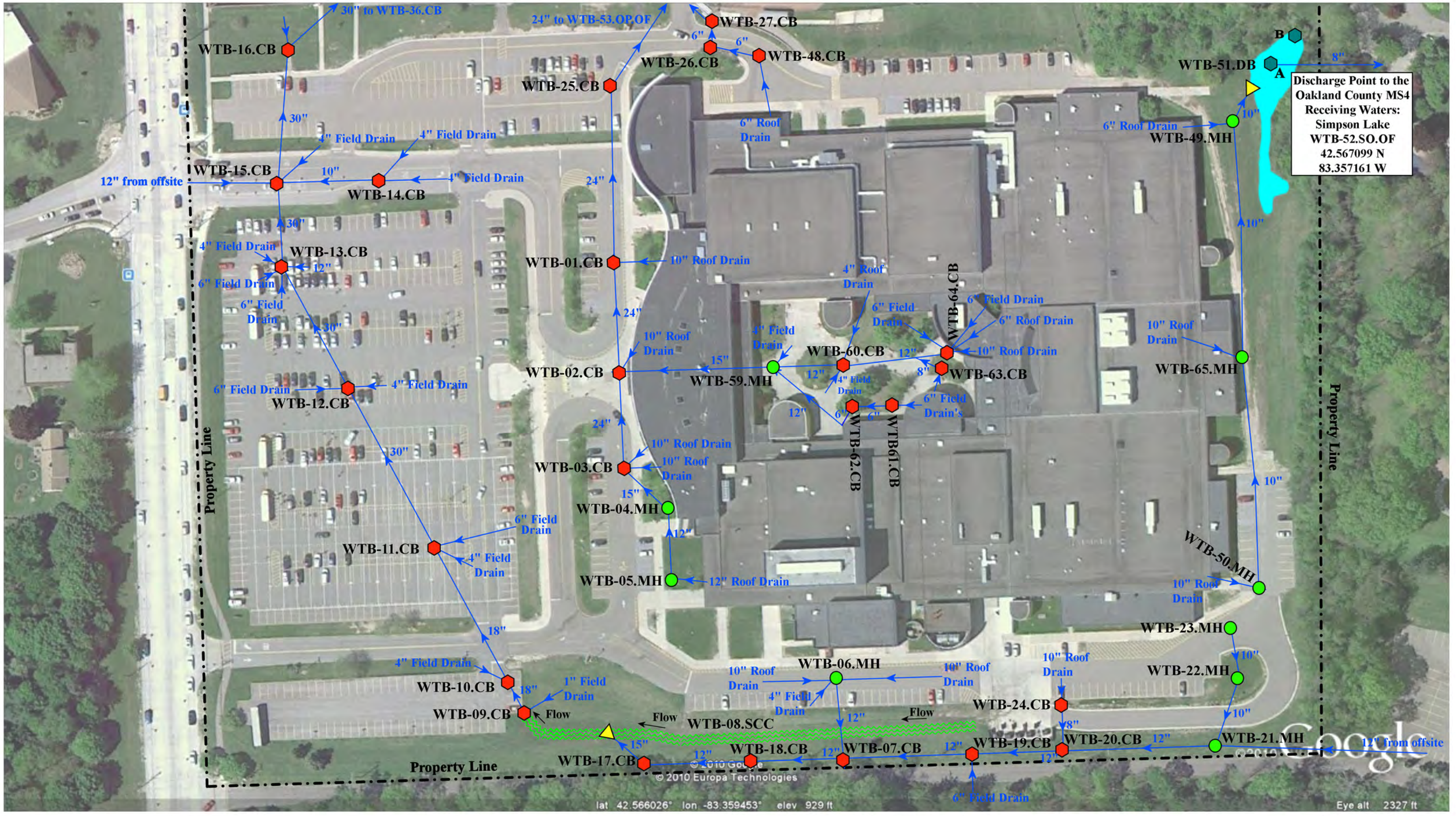


= Catch Basin

= Manhole

= Stabilized outlet

= Stormwater Conveyance Channel

= Open Pipe Outlet

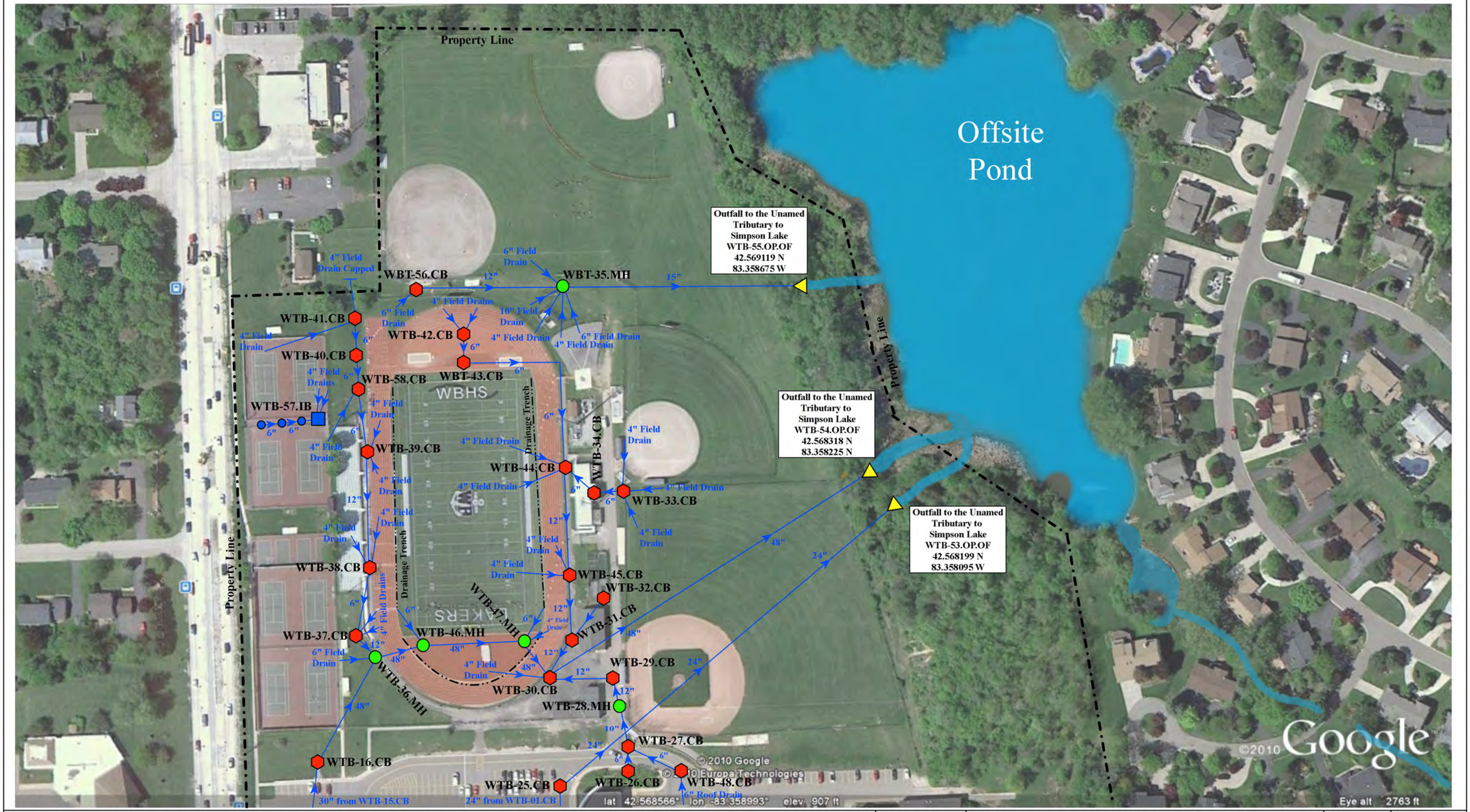
= Detention Basin

North

West Bloomfield High School
4925 Orchard Lake Rd., West Bloomfield Twp., Michigan 48323
West Bloomfield School District

environmental group

Date:	5/1/2019
Drawn by:	SB
Reviewed:	LK
Page #:	1 of 2
Scale:	Not to Scale



= Catch Basin

= Manhole

= Landscape Drain

= Trench Drain

= Open Pipe Outlet

= Infiltration Basin

North

West Bloomfield High School
4925 Orchard Lake Rd., West Bloomfield Twp., Michigan 48323

West Bloomfield School District

Date:	5/1/2019
Drawn by:	SB
Reviewed:	LK
Page #:	1 of 2
Scale:	Not to Scale

environmental group

Brighton Analytical L.L.C. TM

2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 08, 2019

Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

Subject: West Bloomfield HS TMDL Sampling
AE190001-WeBSD

Dear Ms. Sendra :

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/07/2019 for the above mentioned project. NELAP/TNI Accredited Analysis and MDEQ Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of $20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 57823 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely,
Brighton Analytical, L.L.C.

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57823**
BA Sample ID: **CK01086**
Project Name: **West Bloomfield HS TMDL Sampling**
Project Number: **AE190001-WeBSD**
Sample ID: **WTB-S3-OP-OF TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**0**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57823**
BA Sample ID: **CK01087**
Project Name: **West Bloomfield HS TMDL Sampling**
Project Number: **AE190001-WeBSD**
Sample ID: **WTB-S4-OP-OF TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**218.7**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical LLC
2105 Pless Drive
Brighton, Michigan 48114
Phone: (810)229-7575 (810)229-8650
e-mail:bai-brighton@sbcglobal.net
MDNRE Certified #9404
NELAC Accredited #176507

Sample Date: 05/07/2019
Submit Date: 05/07/2019
Report Date: 05/08/2019

To:
Arch Environmental Group
37720 Interchange Dr.
Farmington Hills, MI 48335

BA Report Number: **57826**
BA Sample ID: **CK01093**
Project Name: **Doherty Elementary School TMDL**
Project Number: **AE190001-WeBSD**
Sample ID: **Blank-TMDL**

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Microbiological Analysis						
E. coli (MF)	**0**	CFU/100 ml	1	SM9222B	WT	05/07/2019

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve MDNR designated target detection limits (TDL).

Released by

Date 5/8/2019

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: S7823

PAGE: ___ OF ___

PROJECT NAME: (48 SPACES MAXIMUM) West Bloomfield High School – TMDL Sampling

PROJECT NUMBER: (25 SPACES MAXIMUM) AE190001 WBSD

P.O. NUMBER: West Bloomfield School District

Sample collected by: Cary Meuleman

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab) 1 ☐
RUSH: 2 Business days 2 ☐
RUSH: 3 Business days 3 ☐
RUSH SURCHARGE
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID # (Lab):	Sample Description 35 Characters Limit	Sampling Time	Sampling Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE H_2SO_4 (Nitrite/Nitrate)	HDPE NAOH	AMBER GLASS	AMBER GLASS H_2SO_4	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	E. coli (CFU)
1) 1086	WTB-53.OP.OF TMDL	11:25	5-7						X						L	X
2) 87	WTB-54.OP.OF TMDL	11:36	5-7						X						L	X
3)																
4)																
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

REPORT RESULTS TO:
Arch Environmental Group

Attn:

PHONE: 248-426-0165

FAX: jabs@archenvgroup.com

EMAIL:

Sample received within holding time? yes ☑ no ☐
Temperature of samples °C on ice
pH verified in login? yes ☐ no ☑
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☑
Sample containers and COC match? yes ☑ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☐
Chlorinated Water Supply? yes ☐ no ☐

MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1			5.7.19	15:15	3				
2					4				

Brighton Analytical, L.L.C™

2105 Pless Drive
Brighton, MI 48114
Phone: 810-229-7575 Fax: 810-229-8650

BA PROJECT #: S7826

PROJECT NAME: (48 SPACES MAXIMUM) Doherty Elementary School TMDL

PROJECT NUMBER: (25 SPACES MAXIMUM) AE190001

P.O. NUMBER: West Bloomfield Public Schools

Sample collected by: Kellie Das

If RUSH approved by:

REQUESTED TURNAROUND:(X BOX WITH TAT NEEDED)
Default TAT Standard: 5 - 10 Business days
RUSH: 1 Business day (verify with lab) 1 ☐
RUSH: 2 Business days 2 ☐
RUSH: 3 Business days 3 ☐
RUSH SURCHARGE 4 ☐
1 DAY=3X COST 2 DAY = 2X COST 3 DAY = 1.5X COST

ABBREVIATIONS FOR SAMPLE MATRIX
S = Solid
L = Liquid
DW = Drinking H,0
WW = Wastewater
O = Oil
P = Wipe
A = Air (Tedlar Bag)
F = Filter
T = Tube
M = Misc GW=Groundwater
SW = Surface Water

Analysis Requested/Method

Container Type & Quantity

Brighton ID #	Sample Description (35 Characters Limit)	Sampling Time	Sampling Date	VOA'S (PRES)	VOA'S (UNPRES)	HDPE UNPRESERVED	HDPE HNO_3 FILTERED	HDPE HNO_3 UNFILTERED	HDPE H_2SO_4	HDPE NAOH	AMBER GLASS	AMBER GLASS H_2SO_4	GLASS, NO PRESERVATIVE	MEOH Preserved: (F)ield or (L)ab Preserved	Sample Matrix	e.Coli CFU
1) 90	DOH-07.OP.OF TMDL	9:50	5/7/19						X						L	X
2) 91	DOH-08.OP.OF TMDL	10:05	5/7/19						X						L	X
3) 92	DOH-09.CB.DP TMDL	10:25	5/7/19						X						L	X
4) 93	Blank-TMDL	9:40	5-7-19						X						L	X
5)																
6)																
7)																
8)																
9)																
10)																

Special Instructions: X

PAGE: ___ OF ___

REPORT RESULTS TO:
Arch Environmental Group

Attn:
PHONE:
FAX:
EMAIL: labs@archenvgroup.com

Sample received within holding time? yes ☐ no ☐
Temperature of samples °C: on ice
pH verified in login? yes ☐ no ☐
Headspace/bubbles in VOA'S? yes ☐ no ☐ n/a ☑
Sample containers and COC match? yes ☐ no ☐

BILLING ADDRESS (IF REQUIRED)

Drinking Water:
Fax to LCHD? yes ☐ no ☐
Chlorinated Water Supply? yes ☐ no ☐

MCL Failure yes ☐ no ☐
Client Notified (date/time/initials):

Please fill out the Chain of Custody completely and review. Incorrect or incomplete information will result in a "hold" on all analyses.

Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:	Trans. #	RELINQUISHED BY:	RECEIVED BY:	DATE:	TIME:
1	Kellie Das	[signature]	5-7-19	1515	3				
2					4				