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January 31, 2020

Andrea Klopenstein, P.E.  
Assistant Director, Storm Water Engineer  
City of Peoria Public Works Department  
3505 N. Dries Ln  
Peoria, IL 61604

Dear Ms. Klopenstein:

RE: Review of Storm Water Samples Collected for the Separate Storm Sewer System (MS4) Permit for the calendar year 2019.

The following is a summary report for storm water samples collected in 2019 from sample points P1 through P4. Include in this summary report are:

- ◆ Goals of the MS4 Permit, Sample Point Location and Descriptions
- ◆ Summary of Procedures Utilized to Collect Storm Water Samples
- ◆ Figure showing Sample Point Locations
- ◆ Analytical Data Summary Including Trends and Potential Areas of Concern
- ◆ Laboratory Analytical Data

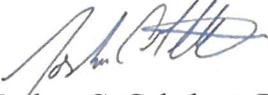
Four sample locations (P1 through P4) were selected that would be representative of runoff from storm events, to meet requirements of the MS4 Permit and determine whether surface water quality is improving, remaining stable, or decreasing. The sample point locations are located outside of the known Combined Sewer System (CSO) system and should be only storm water flowing within the City of Peoria boundaries. Sampling point 1 is located the farthest to the north and encompasses a mix of residential, industrial and commercial properties. Sampling point 2 covers the northwest and some of the middle parts of the city with a mix of residential, commercial and industrial properties. Sampling point 3 is a mix of residential and commercial properties, and sample point 4 encompasses the eastern part of the city and is predominately residential. The four sample point locations are shown on attached Figure 1.

Per General NPDES Permit ILR40, storm water samples must be collected within 48 hours of a precipitation event greater than or equal to one quarter inch of precipitation in a 24 hour period. Only one Storm water sample per location is required to be collected per quarter. If there is insufficient precipitation during a quarter, storm water samples would not be collected. Storm water samples were collected every quarter in 2019 beginning with the first set of samples collected on February 6, 2019. All four locations

were sampled on the same day. Storm water samples were grab samples and were collected directly from the stream. Flow rate is not factored in sample collection as flow monitoring devices are not installed at the sampling point. Field observation sheets noting precipitation amount, weather conditions, sample appearance, etc. were completed at each sampling point every quarter, and are attached in Appendix A. There were no observed factors that appeared to bias sample results. Some of those factors (if present) could be sheens, discoloration, smell, animal carcass/feces, etc. The parameters analyzed are required under General NPDES Permit ILR40 Part V.(A)(2)(c) and are shown in the attached Tables 1 through 4 and graphically in Figures 2 through 8. A graph was not generated for the parameter grease and oil because concentration levels were less than the laboratory reporting limit (not detected). As shown in the figures, the sample locations exhibited similar trends from quarter to quarter. The majority of the highest concentrations reported at each sampling point occurred during the 2<sup>nd</sup> quarter sampling event, which also had the highest recorded precipitation prior to sampling. As shown in Figure 8, the fecal coliform concentration was consistent across all four sampling points in 2019. The only exception was the 2<sup>nd</sup> quarter 2019 concentration reported at sample point 4, located near the CSO boundaries (N. Sheridan Rd. and Richmond Ave.) The fecal coliform concentration at sample point 4 returned to levels consistent with the other sampling points for the following 3<sup>rd</sup> and 4<sup>rd</sup> quarter samples. The fecal coliform concentration at all sampling points will be closely monitored in 2020 and potential sources will be investigated.

2019 was the first year of sampling and during the next couple of years, baseline concentrations for the individual sampling points will be determined. Analytical parameters will be analyzed looking for trends, in particular, the fecal coliform concentration. Future analytical results will be compared to these baseline values to determine whether surface water quality is improving, remaining stable, or decreasing.

Sincerely,  
Foth Infrastructure & Environment, LLC

  
Joshua C. Gabehart, P.E.  
*Lead Environmental Engineer*  
Licensed in IL, IA, AR, GA

  
Mark A. Williams  
*Lead Environmental Scientist*

Enclosures:

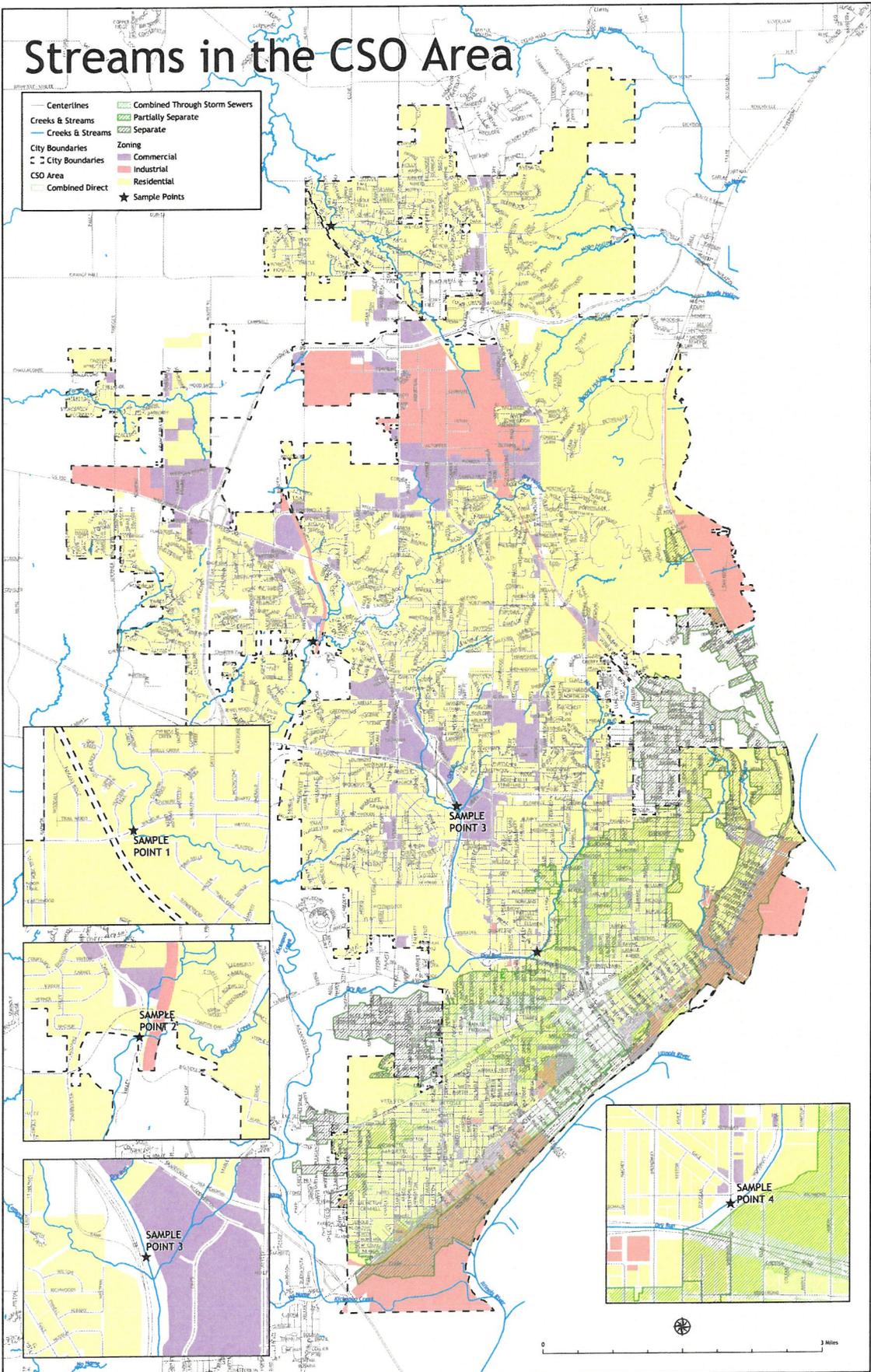
- Figure 1 - Map of Sample Point Locations
- Figure 2 - Total Chloride Concentration Graph
- Figure 3 - Total Suspended Solids Concentration Graph

Figure 4 - Total Nitrogen Concentration Graph  
Figure 5 - Total Nitrate Concentration Graph  
Figure 6 - Total Phosphorous Concentration Graph  
Figure 7 - TKN Ammonia Concentration Graph  
Figure 8 - Total Fecal Coliform Concentration Graph  
Table 1 – Sampling Point 1 Laboratory Analytical Results  
Table 2 – Sampling Point 2 Laboratory Analytical Results  
Table 3 – Sampling Point 3 Laboratory Analytical Results  
Table 4 – Sampling Point 4 Laboratory Analytical Results

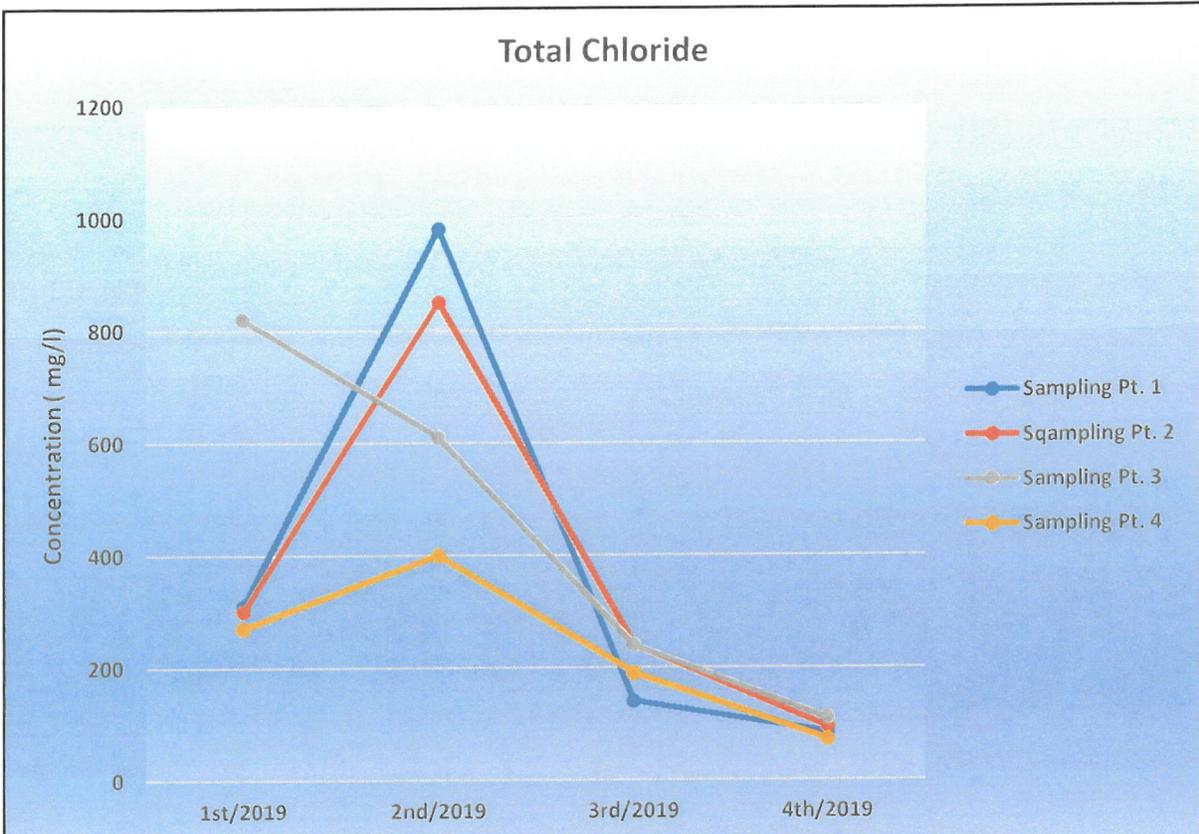
Appendix A - Field Observation Sheets

# Streams in the CSO Area

- Centerlines
- Creeks & Streams
- Creeks & Streams
- City Boundaries
- City Boundaries
- CSO Area
- Combined Direct
- Combined Through Storm Sewers
- Partially Separate
- Separate
- Zoning
- Commercial
- Industrial
- Residential
- ★ Sample Points

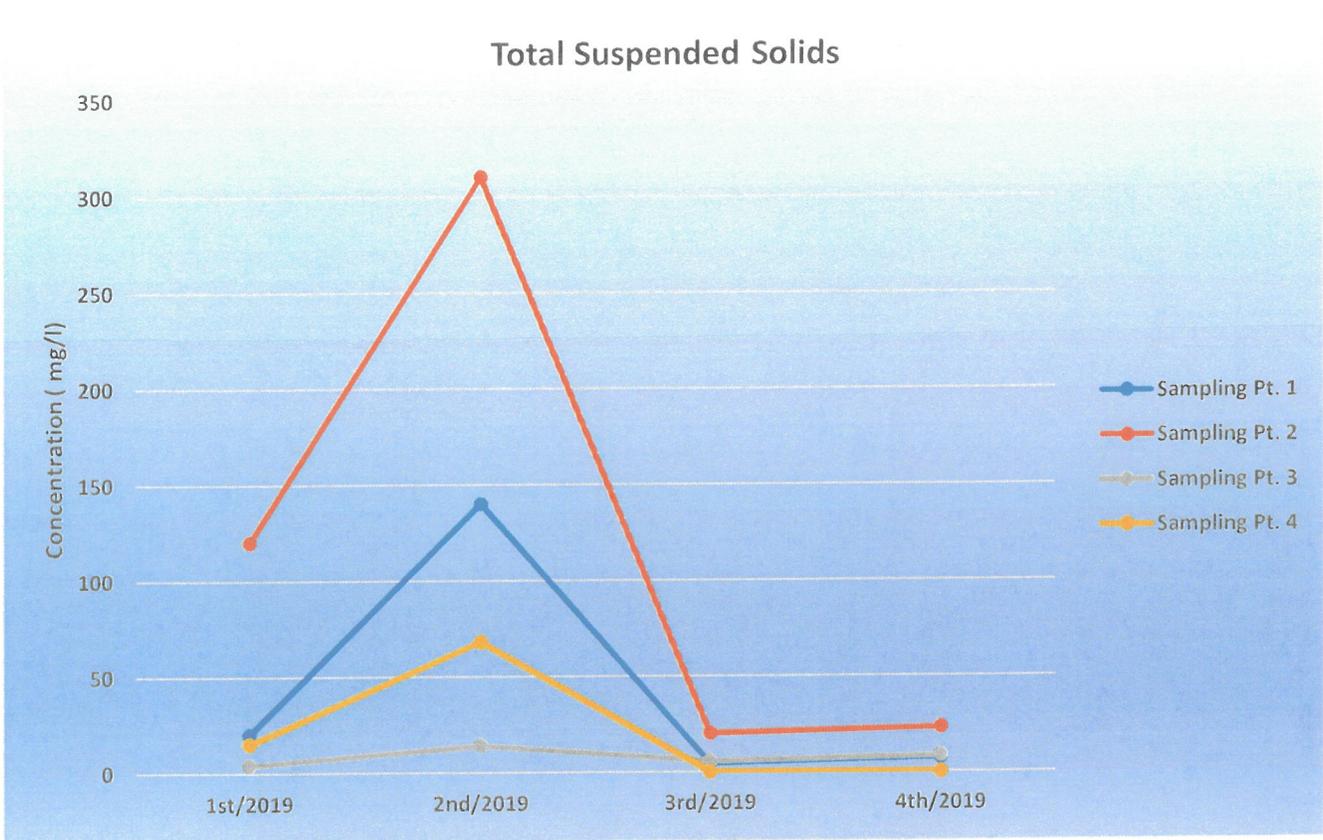


**Figure 2**  
**Total Chloride**  
**1Q19-4Q19**



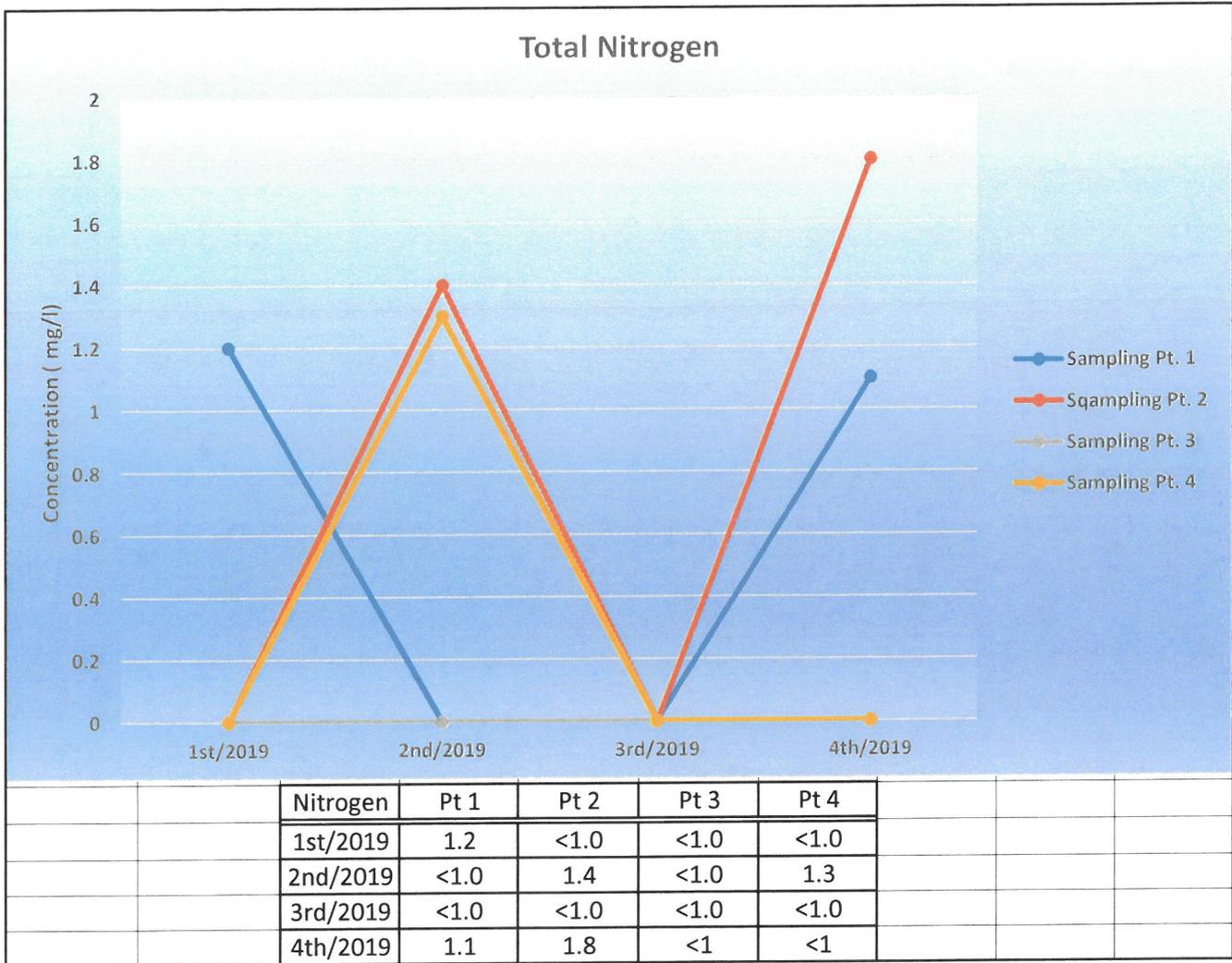
	Chloride	Pt 1	Pt 2	Pt 3	Pt 4
1st/2019		310	300	820	270
2nd/2019		980	850	610	400
3rd/2019		140	240	240	190
4th/2019		85	94	110	72

**Figure 3**  
**Total Suspended Solids**  
**1Q19-4Q19**

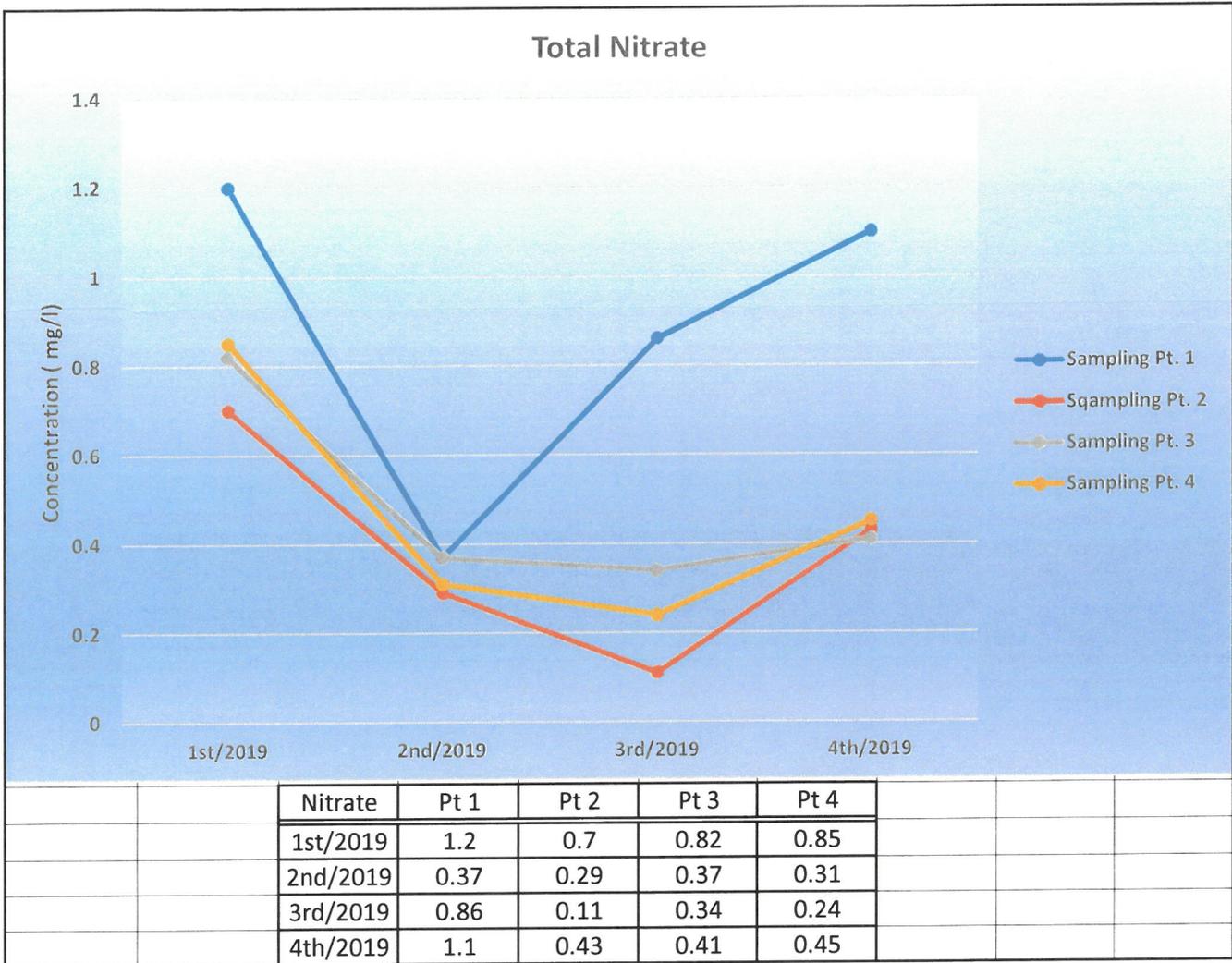


TSS	Pt 1	Pt 2	Pt 3	Pt 4
1st/2019	20	120	4	15
2nd/2019	140	310	14	68
3rd/2019	4.4	20	5.6	<4
4th/2019	7.2	23	8.4	<4

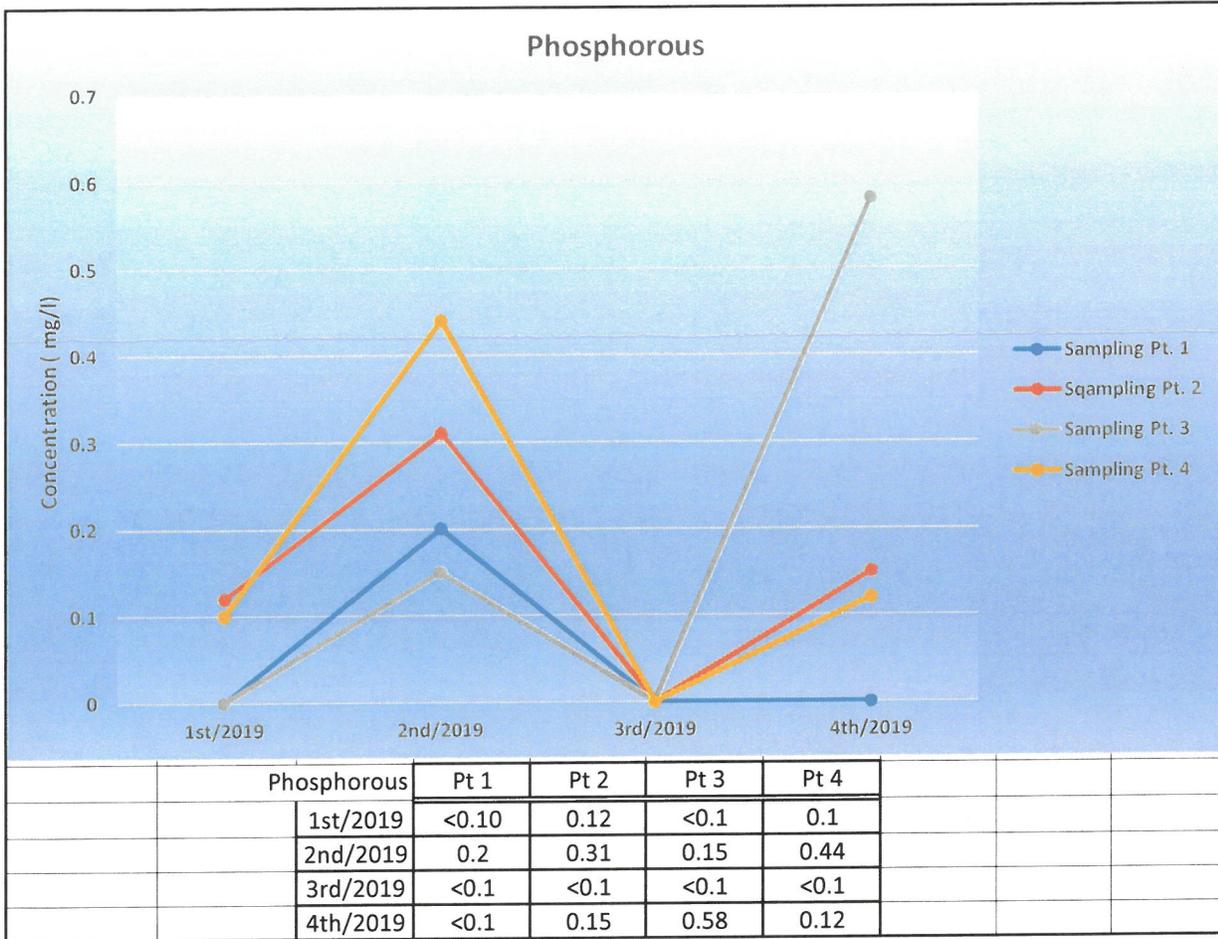
**Figure 4**  
**Total Nitrogen**  
**1Q19-4Q19**



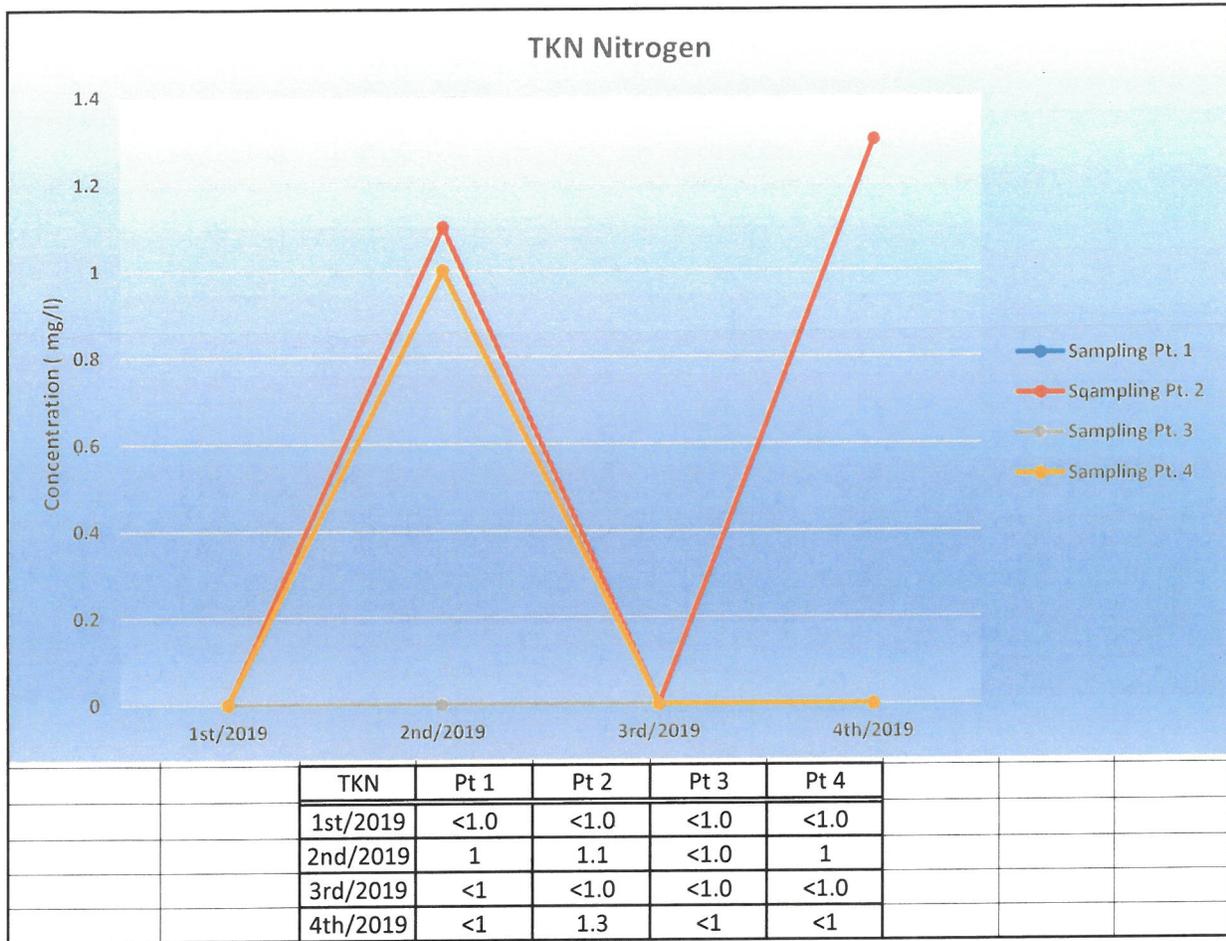
**Figure 5**  
**Total Nitrate**  
**1Q19-4Q19**



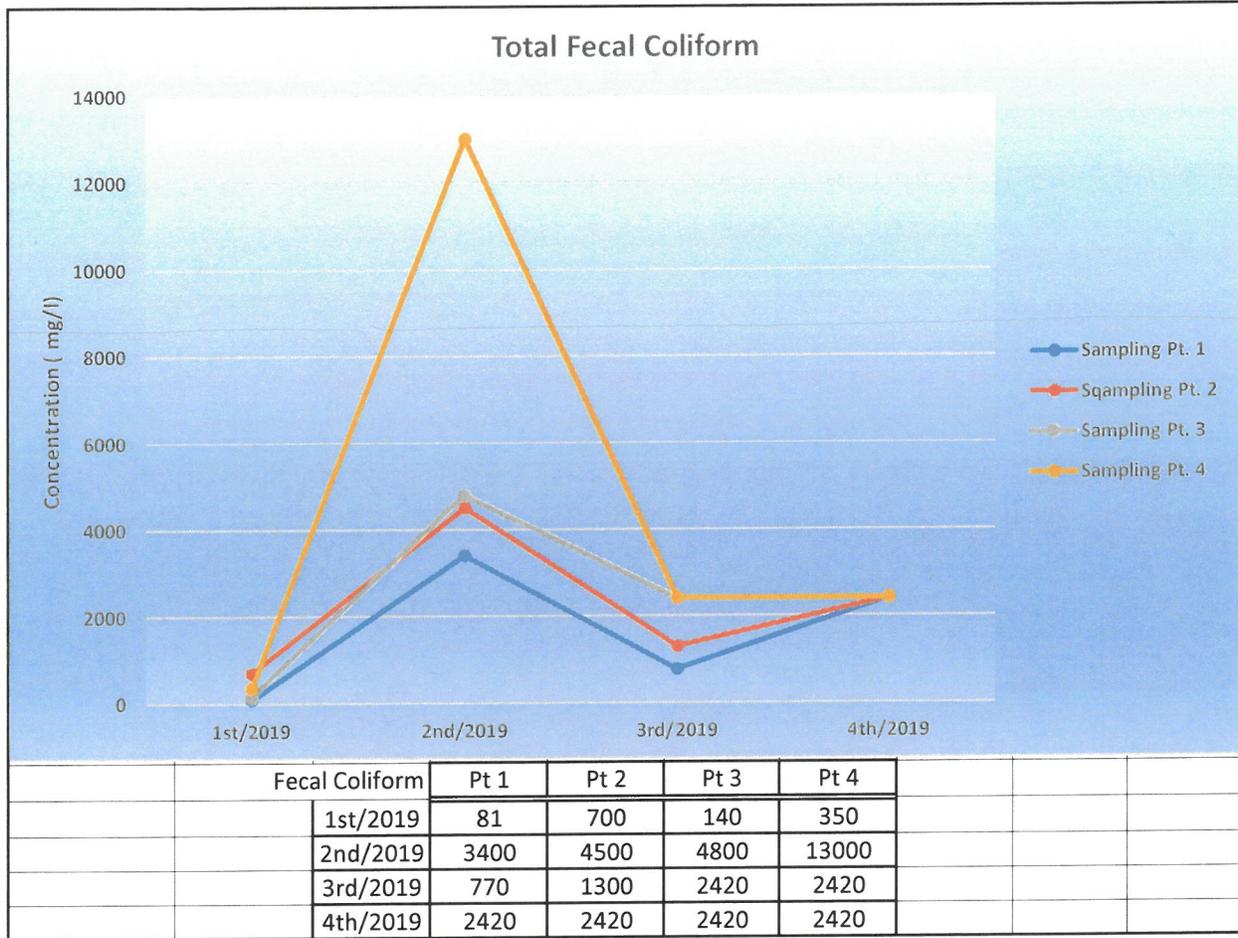
**Figure 6**  
**Total Phosphorous**  
**1Q19-4Q19**



**Figure 7**  
**TKN Ammonia**  
**1Q19-4Q19**



**Figure 8**  
**Total Fecal Coliform**  
**1Q19-4Q19**



## Tables

**Table 1**  
**Sample Point 1 Analytical Results from**  
**1Q19-4Q19**

<b>Parameters</b>	<b>Units</b>	<b>1Q2019</b>	<b>2Q2019</b>	<b>3Q2019</b>	<b>4Q2019</b>
Chloride	mg/l	310	980	140	85
Oil and Grease	mg/l	<5.3	<5.8	<6.1	<6.6
Total Suspended Solids (TSS)	mg/l	20	140	4.4	7.2
Total Nitrogen	mg/l	1.2	<1.0	<1.0	1.1
Fecal Coliform	CFU/100 ml	81	3400	770	2420
Nitrate/Nitrite	mg/l	1.2	0.37	0.86	1.1
Phosphorous Total as P	mg/l	<0.10	0.2	<0.1	<0.1
Total Kjeldahl-Nitrogen (TKN)	mg/l	<1.0	1	<1	<1
<b>Precipitation</b>					
Last 24 hours	inch	0.3	1	0.29	0.65
Last 48 hours	inch	0.31	1.03	0.29	0.65

**Table 2**  
**Sample Point 2 Analytical Results**  
**1Q/2019-4Q2019**

<b>Parameters</b>	<b>Units</b>	<b>1Q2019</b>	<b>2Q2019</b>	<b>3Q2019</b>	<b>4Q2019</b>
Chloride	mg/l	300	850	240	94
Oil and Grease	mg/l	<5.3	<5.5	<6.3	<6.3
Total Suspended Solids (TSS)	mg/l	120	310	20	23
Total Nitrogen	mg/l	<1.0	1.4	<1.0	1.8
Fecal Coliform	CFU/100 ml	700	4500	1300	>2420
Nitrate/Nitrite	mg/l	0.7	0.29	0.11	0.43
Phosphorous Total as P	mg/l	0.12	0.31	<0.1	0.15
Total Kjeldahl-Nitrogen (TKN)	mg/l	<1.0	1.1	<1.0	1.3
<b>Precipitation</b>					
Last 24 hours	inch	0.3	1	0.29	0.65
Last 48 hours	inch	0.31	1.03	0.29	0.65

**Table 3**  
**Sample Point 3 Analytical Results**  
**1Q2019-4Q2019**

<b>Parameters</b>	<b>Units</b>	<b>1Q2019</b>	<b>2Q2019</b>	<b>3Q2019</b>	<b>4Q2019</b>
Chloride	mg/l	820	610	240	110
Oil and Grease	mg/l	<5.3	<5.6	<6.3	<6.3
Total Suspended Solids (TSS)	mg/l	4	14	5.6	8.4
Total Nitrogen	mg/l	<1.0	<1.0	<1.0	<1
Fecal Coliform	CFU/100 ml	140	4800	>2420	>2420
Nitrate/Nitrite	mg/l	0.82	0.37	0.34	0.41
Phosphorous Total as P	mg/l	<0.1	0.15	<0.1	0.58
Total Kjeldahl-Nitrogen (TKN)	mg/l	<1.0	<1.0	<1.0	<1
<b>Precipitation</b>					
Last 24 hours	inch	0.3	1	0.29	0.65
Last 48 hours	inch	0.31	1.03	0.29	0.65

**Table 4**  
**Sample Point 4 Analytical Results**  
**1Q2019-4Q2019**

<b>Parameters</b>	<b>Units</b>	<b>1Q2019</b>	<b>2Q2019</b>	<b>3Q2019</b>	<b>4Q2019</b>
Chloride	mg/l	270	400	190	72
Oil and Grease	mg/l	<5.2	<5.7	<6.1	<6.3
Total Suspended Solids (TSS)	mg/l	15	68	<4	<4
Total Nitrogen	mg/l	<1.0	1.3	<1.0	<1
Fecal Coliform	CFU/100 ml	350	13000	>2420	>2420
Nitrate/Nitrite	mg/l	0.85	0.31	0.24	0.45
Phosphorous Total as P	mg/l	0.1	0.44	<0.1	0.12
Total Kjeldahl-Nitrogen (TKN)	mg/l	<1.0	1	<1.0	<1
<b>Precipitation</b>					
Last 24 hours	inch	0.3	1	0.29	0.65
Last 48 hours	inch	0.31	1.03	0.29	0.65

## **Appendix A**

### **Field Observation Sheets**

**Field Sheet**  
**1<sup>st</sup> Quarter 2019**



## Storm Water Sample Collection Form

<b>Proj. Name:</b>	City of Peoria, IL - Storm Water Sampling
<b>Date:</b>	02/06/2019
<b>Sampling Location Point:</b>	Sample Pt # 1
<b>Sampling Personnel:</b>	Mark Williams / Dakota Ladwig

### Conditions of Sampling Point Location

<b>Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):</b>	Good Flow, No debris	
	Last 24 hours	Last 48 hours
<b>Precipitation:</b>	0.30"	0.31"
<b>Current Outdoor Air Temperature:</b>	34°	
<b>Current Weather Conditions:</b>	cloudy	

### Water Sample Observations

<b>Odor:</b>	None
<b>Appearance:</b>	
<b>Color:</b>	Lt - brown
<b>Turbidity:</b>	slight
<b>Other:</b>	

**Additional Information/Comments**

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### Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	02/06/2019	
Sampling Location Point:	Sample Pt # 2	
Sampling Personnel:	Mark Williams / Dakota Ludwig	

**Conditions of Sampling Point Location**

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	No debris, Good Flow	
Precipitation:	Last 24 hours	Last 48 hours
	0.30"	0.31"
Current Outdoor Air Temperature:	33°	
Current Weather Conditions:	33° cloudy	

**Water Sample Observations**

Odor:	earthy
Appearance:	
Color:	brown
Turbidity:	moderate
Other:	

**Additional Information/Comments**

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### Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	02/06/2019	
Sampling Location Point:	Sample pt # 3	
Sampling Personnel:	Mark Williams / Dakota Ludwig	

#### Conditions of Sampling Point Location

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	No debris, some dead cattails near sampling pt.	
	Last 24 hours	Last 48 hours
Precipitation:	0.30"	0.31"
Current Outdoor Air Temperature:	34°	
Current Weather Conditions:	Cloudy	

#### Water Sample Observations

Odor:	None
Appearance:	
Color:	Light brown
Turbidity:	
Other:	

**Additional Information/Comments**

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## Storm Water Sample Collection Form

<b>Proj. Name:</b>	City of Peoria, IL - Storm Water Sampling	
<b>Date:</b>	02/06/2019	
<b>Sampling Location Point:</b>	Sample pt # 4	
<b>Sampling Personnel:</b>	Mark William Dakota Ludwig	

### Conditions of Sampling Point Location

<b>Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):</b>	No debris, Good flow	
	<b>Last 24 hours</b>	<b>Last 48 hours</b>
<b>Precipitation:</b>	0.30"	0.31"
<b>Current Outdoor Air Temperature:</b>	34°	
<b>Current Weather Conditions:</b>	cloudy	

### Water Sample Observations

<b>Odor:</b>	None
<b>Appearance:</b>	
<b>Color:</b>	Light brown
<b>Turbidity:</b>	Slight
<b>Other:</b>	

**Additional Information/Comments**

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**Field Sheet**  
**2<sup>nd</sup> Quarter 2019**



## Storm Water Sample Collection Form

<b>Proj. Name:</b>	City of Peoria, IL - Storm Water Sampling
<b>Date:</b>	04 / 29 / 2019
<b>Sampling Location Point:</b>	Sample Pt # 1
<b>Sampling Personnel:</b>	Mark Williams & Dakota Ludwig

### Conditions of Sampling Point Location

<b>Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):</b>	No debris	
<b>Precipitation:</b>	Last 24 hours 1.00"	Last 48 hours 1.03"
<b>Current Outdoor Air Temperature:</b>	57°F	
<b>Current Weather Conditions:</b>	Cloudy / Calm	

### Water Sample Observations

<b>Odor:</b>	None
<b>Appearance:</b>	
<b>Color:</b>	light - medium brown
<b>Turbidity:</b>	Moderate Turbidity
<b>Other:</b>	Time of Sampling 14:40

**Additional Information/Comments**

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## Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	04/29/2019	
Sampling Location Point:	Sample Pt #2	
Sampling Personnel:	Mark Williams & Dakota Ludwig	

### Conditions of Sampling Point Location

<b>Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):</b>	No Debris - Swift flow	
	Last 24 hours	Last 48 hours
<b>Precipitation:</b>	1.00"	1.03"
<b>Current Outdoor Air Temperature:</b>	57°	
<b>Current Weather Conditions:</b>	Calm	

### Water Sample Observations

Odor:	None	
Appearance:		
Color:	Medium brown	
Turbidity:	Moderate	
Other:	Time of Sample 14.18	

**Additional Information/Comments**

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## Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	04/29/2019	
Sampling Location Point:	Sample Pt # 3	
Sampling Personnel:	Mark Williams & Dakota Ludwig	

### Conditions of Sampling Point Location

<b>Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):</b>	No Debris	
<b>Precipitation:</b>	Last 24 hours 1.00"	Last 48 hours 1.03"
<b>Current Outdoor Air Temperature:</b>	56°	
<b>Current Weather Conditions:</b>	Cloudy, calm wind	

### Water Sample Observations

Odor:	None	
Appearance:	light brown	
Color:	1. "	
Turbidity:	Slight Turbidity	
Other:	Time of Sampling 14:00	

**Additional Information/Comments**

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**Storm Water Sample Collection Form**

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	04/29/2019	
Sampling Location Point:	Sample Pt # 4	
Sampling Personnel:	Mark Williams & Dakota Ladwig	

**Conditions of Sampling Point Location**

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	No Debris swift flow	
Precipitation:	Last 24 hours	Last 48 hours
	1.00"	1.03"
Current Outdoor Air Temperature:	57°F	
Current Weather Conditions:	Cloudy, Calm wind	

**Water Sample Observations**

Odor:	None
Appearance:	Turbid. Strong
Color:	Brown
Turbidity:	yes - (Strong)
Other:	Time of sampling 13:40

**Additional Information/Comments**

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**Field Sheet**  
**3<sup>rd</sup> Quarter 2019**



## Storm Water Sample Collection Form

<b>Proj. Name:</b>	City of Peoria, IL - Storm Water Sampling
<b>Date:</b>	08/07/2019
<b>Sampling Location Point:</b>	Sample PE 1
<b>Sampling Personnel:</b>	Mark Williams & Dakota Ludwig

### Conditions of Sampling Point Location

<b>Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):</b>	No debris	
	low flow	
	Last 24 hours	Last 48 hours
<b>Precipitation:</b>	0.29"	0.29"
<b>Current Outdoor Air Temperature:</b>	82°F	
<b>Current Weather Conditions:</b>	Sunny	

### Water Sample Observations

<b>Odor:</b>	None
<b>Appearance:</b>	Clear
<b>Color:</b>	lt brown
<b>Turbidity:</b>	Slight
<b>Other:</b>	low flow

**Additional Information/Comments**

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## Storm Water Sample Collection Form

<b>Proj. Name:</b>	City of Peoria, IL - Storm Water Sampling
<b>Date:</b>	08/07/2019
<b>Sampling Location Point:</b>	Sample Pt 2
<b>Sampling Personnel:</b>	Mark Williams & Dakota Ladwig

### Conditions of Sampling Point Location

<b>Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):</b>	No debris	
	low flow	
<b>Precipitation:</b>	Last 24 hours	Last 48 hours
	0.29"	0.29"
<b>Current Outdoor Air Temperature:</b>	81°F	
<b>Current Weather Conditions:</b>	Sunny	

### Water Sample Observations

<b>Odor:</b>	None
<b>Appearance:</b>	Clear
<b>Color:</b>	lt brown
<b>Turbidity:</b>	Moderate
<b>Other:</b>	low flow

**Additional Information/Comments**

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### Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	08/07/2019	
Sampling Location Point:	Sample Pt 3	
Sampling Personnel:	Mark Williams & Dakota Ladwig	

#### Conditions of Sampling Point Location

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	no debris	
	low flow	
Precipitation:	Last 24 hours 0.29"	Last 48 hours 0.29"
Current Outdoor Air Temperature:	79°F	
Current Weather Conditions:	Sunny	

#### Water Sample Observations

Odor:	None
Appearance:	clear
Color:	lt brown
Turbidity:	slight
Other:	low flow

**Additional Information/Comments**

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### Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	08/07/2019	
Sampling Location Point:	Sample Pt 4	
Sampling Personnel:	Dakota Ladwig & Mark Williams	

#### Conditions of Sampling Point Location

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	No debris	
	Last 24 hours	Last 48 hours
Precipitation:	0.29"	0.29"
Current Outdoor Air Temperature:	79°F	
Current Weather Conditions:	Sunny	

#### Water Sample Observations

Odor:	None
Appearance:	lt brown
Color:	" "
Turbidity:	Slight
Other:	low flow

**Additional Information/Comments**

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**Field Sheet**  
**4<sup>th</sup> Quarter 2019**



18P577

Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	10/03/2019	
Sampling Location Point:	Sample Pt 1	
Sampling Personnel:	Dakota Ludwig & Mark Williams	

Conditions of Sampling Point Location

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	None	
Precipitation:	Last 24 hours 0.65"	Last 48 hours 0.65"
Current Outdoor Air Temperature:	64°F	
Current Weather Conditions:	Cloudy	

Water Sample Observations

Odor:	None
Appearance:	Clear
Color:	lt brown
Turbidity:	low - med
Other:	

Additional Information/Comments

Medium to high flow



18P577

Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	10/03/2019	
Sampling Location Point:	Sample Pt 2	
Sampling Personnel:	Daleeta Ludwig & Mark Williams	

Conditions of Sampling Point Location

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	None	
Precipitation:	Last 24 hours	Last 48 hours
	0.65"	0.65"
Current Outdoor Air Temperature:	64°F	
Current Weather Conditions:	Cloudy	

Water Sample Observations

Odor:	None
Appearance:	Clear
Color:	lt brn - brn
Turbidity:	Medium
Other:	

Additional Information/Comments

Medium to high flow



18P577

Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	10/03/2019	
Sampling Location Point:	Sample Pt 3	
Sampling Personnel:	Dakota Ludwig & Mark Williams	

Conditions of Sampling Point Location

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	None	
Precipitation:	Last 24 hours 0.65"	Last 48 hours 0.65"
Current Outdoor Air Temperature:	63°	
Current Weather Conditions:	Cloudy	

Water Sample Observations

Odor:	No
Appearance:	Clear
Color:	lt brown
Turbidity:	Low
Other:	

Medium Flow

Additional Information/Comments




18P577

Storm Water Sample Collection Form

Proj. Name:	City of Peoria, IL - Storm Water Sampling	
Date:	10/03/2019	
Sampling Location Point:	Sample Pt 4	
Sampling Personnel:	Dakota Ladwig & Mark Williams	

Conditions of Sampling Point Location

Observations of Sampling Point Location (e.g., debris, downed trees, erosion, excessive sediment, etc.):	None	
Precipitation:	Last 24 hours 0.65"	Last 48 hours 0.65"
Current Outdoor Air Temperature:	63	
Current Weather Conditions:	Cloudy	

Water Sample Observations

Odor:	None
Appearance:	Clear
Color:	lt brown
Turbidity:	low
Other:	

Medium flow

Additional Information/Comments
