

May 22, 2014

Monitoring Data Analysis for March 27, 2014 – May 5, 2014

### Kinley Creek Monitoring Sites

During this monitoring period, the Kinley Creek data showed typical diurnal fluctuations, with peak DO, water temperature, and pH levels occurring in mid-afternoon. The KINA and KINB sites had average DO levels for the monitoring period greater than 7 mg/L, respectively. While these average values were well above the regulatory minimum, the DO levels dipped as low as 4.7 mg/L at both monitoring locations. At both sites, these low values were recorded on 2 occasions, for only several hours at a time. These low DO levels were because of extremely low flow conditions creating stagnant water near the monitoring station.

Like the Gills Creek Watershed, the Kinley Creek Watershed saw 6 storms in this monitoring period. The Kinley Creek sites showed a very rapid storm response, with stage and turbidity values spiking very shortly after the start of rain events, and specific conductivity becoming diluted very quickly. In the Gills Creek watershed, pH is generally observed to decrease during a storm event; at the Kinley Creek sites, the pH did decrease during a majority of storm events, but during some events the pH increased slightly.

This monitoring period corresponded to the height of the pollen season in the Columbia area. As a result, on several occasions, the Kinley Creek sondes required brief field maintenance to remove accumulated pollen from the sonde probes. As the sonde probes became fouled, this was noted on the City's monitoring website, and field maintenance was performed efficiently, allowing for a more accurate and complete dataset to be collected. Fortunately, with minor drift corrections, the data collected during the periods of mild fouling were able to be salvaged. Beyond this, the first sonde deployment at the Kinley sites experienced no significant issues.

A number of illicit discharges were observed at the Kinley Creek stations during this monitoring period. With the real time telemetry communicating updated data to the City's monitoring website, these illicit events could be noted and in some cases tracked. At KINA, illicit discharges were observed on April 1st, April 24th, and May 1st. The event on April 1st was considerable, with the pH values increasing to 8.6. All three of these suspected illicit discharges also caused increases in the specific conductivity readings and ammonium readings (not shown in the attached report) and occurred on weekdays during the afternoon. These events may have had the same source, but without further observations and field visits, the exact source cannot be identified.

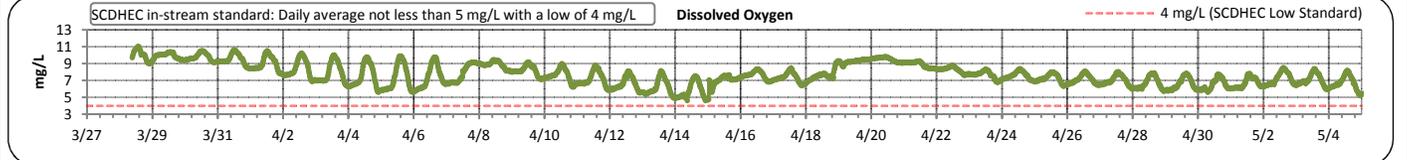
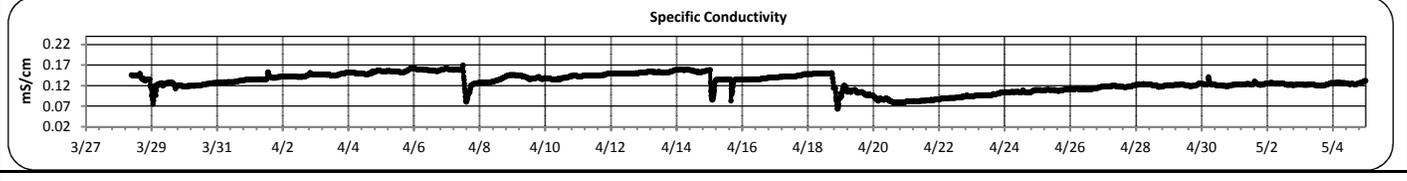
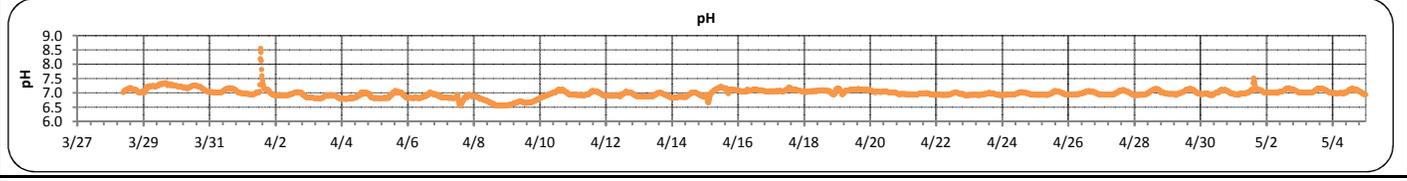
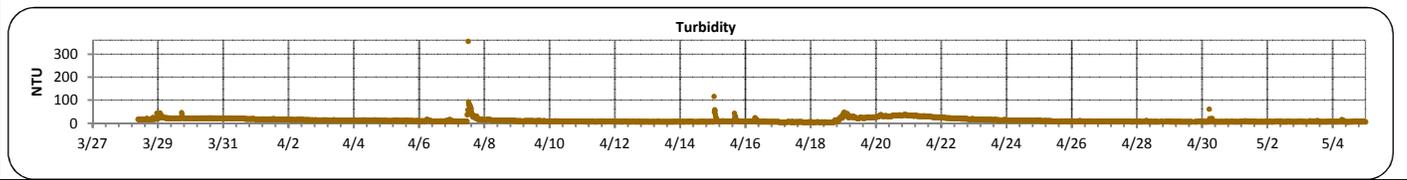
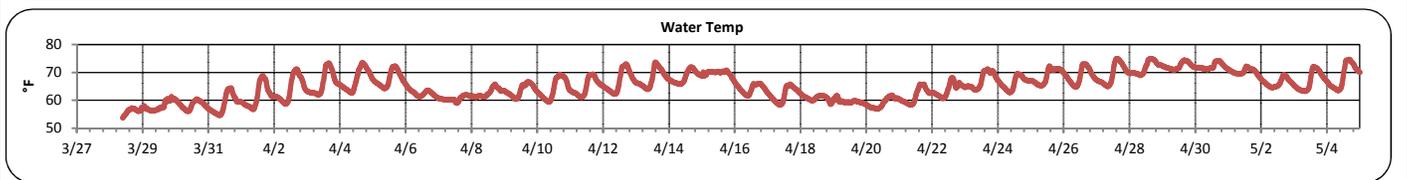
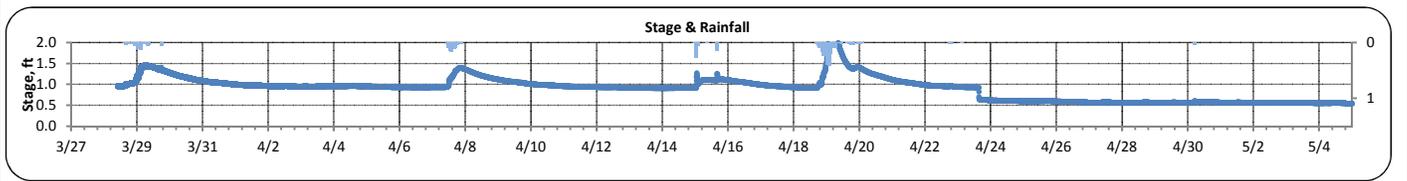
The KINB station also recorded a number of suspected illicit discharges. For many of the days of this monitoring period, a slight stage increase and slight specific conductivity increase were observed. This discharge is fairly predictable, and may be from a source such as irrigation, which occurs almost daily. Additional potential illicit events were observed on April 1st, May 1st, May 3rd, and May 4th on the real

time monitoring website. None of these possible illicit discharges caused significant water quality impacts in the parameters monitored at the KINB station, but all were clearly noticeable.

One final observation of note was made when examining the first month of collected data from the Kinley Creek Watershed. The collected stage data at the KINA station showed unusual behavior on April 23rd, when the stage abruptly decreased by over half a foot. One likely explanation for this is the presence of a controlled lake upstream of the KINA site. The lake has a control structure which may have been operated in such a way that the flow on April 23rd was abruptly decreased.

**Kinley Creek A (Mar 27 -- May 5, 2014)**

PARAMETER	DESCRIPTION	CONTINUOUS WATER QUALITY PARAMETERS:	SUMMARY STATISTICS				
			MINIMUM OBSERVED	MAXIMUM OBSERVED	MEDIAN OBSERVED	MEAN OBSERVED	STANDARD DEVIATION
STREAM NAME:	Kinley Creek	STAGE (FT):	1.0	1.5	1.2	1.2	0.2
LOCATION:	Longhorn Steakhouse	TEMPERATURE (°F):	54	78	65	65	5
ADDRESS:	171 Harbison Blvd Columbia, SC 29212	TURBIDITY (NTU):	4	356	9	13	10
COORDINATES:	34.069897, -81.164592	pH:	6.6	8.6	7.0	7.0	0.1
TMDL/IMPAIRMENT:	Fecal Coliform	SPECIFIC CONDUCTIVITY (mS/cm):	0.063	0.17	0.128	0.128	0.021
NEIGHBORING LANDUSE:	Residential and commercial	DISSOLVED OXYGEN (mg/L):	4.7	11.1	7.6	7.7	1.3
SPATIAL LOCATION:	Most upstream site						
TOTAL NO. STORMS OVER 0.1 INCH:	6						
MAX. DAILY RAINFALL:	1.4 inches						
TOTAL RAINFALL (FOR PERIOD):	4.8 inches						



Note: Data gaps appear when the sonde is removed for calibration or when the flow depth is below the sensors

**Explanation of Statistics:**

<b>MINIMUM OBSERVED</b>	The minimum of the values recorded by the datasonde in 15 minute intervals.
<b>MAXIMUM OBSERVED</b>	The maximum of the values recorded by the datasonde in 15 minute intervals.
<b>MEDIAN OBSERVED</b>	The median of all the values recorded by the datasonde in 15 minute intervals.
<b>MEAN OBSERVED</b>	The average of all the values recorded by the datasonde in 15 minute intervals.
<b>STANDARD DEVIATION</b>	The standard deviation of all the values recorded by the datasonde in 15 minute intervals.

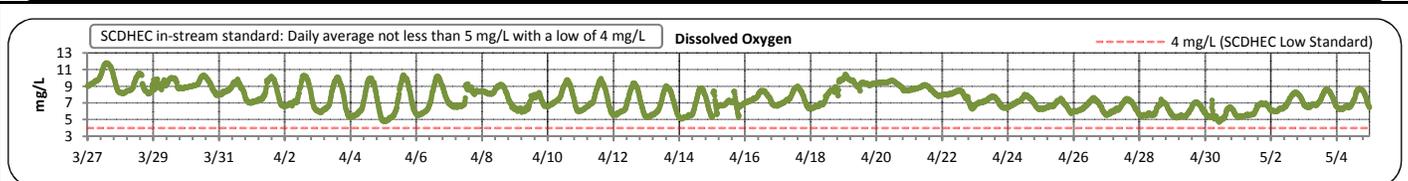
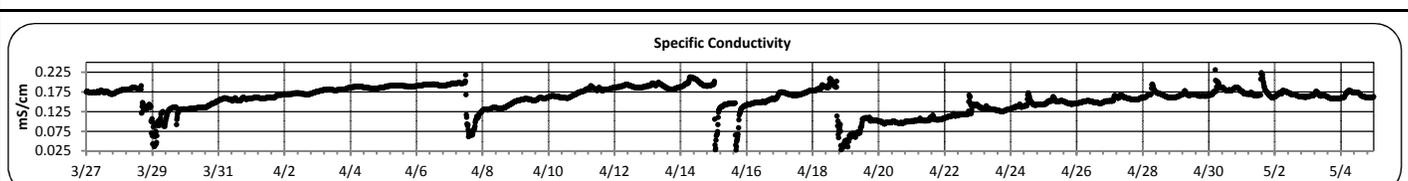
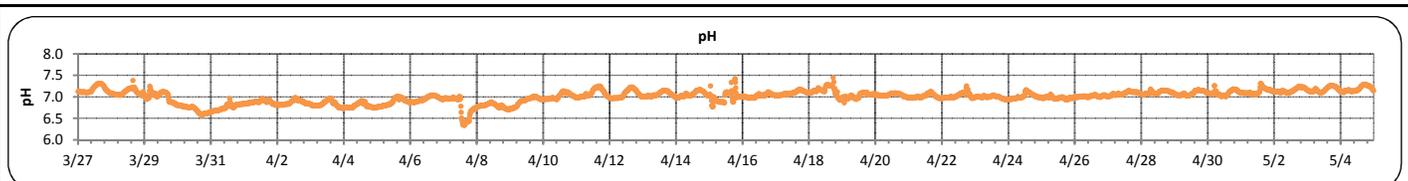
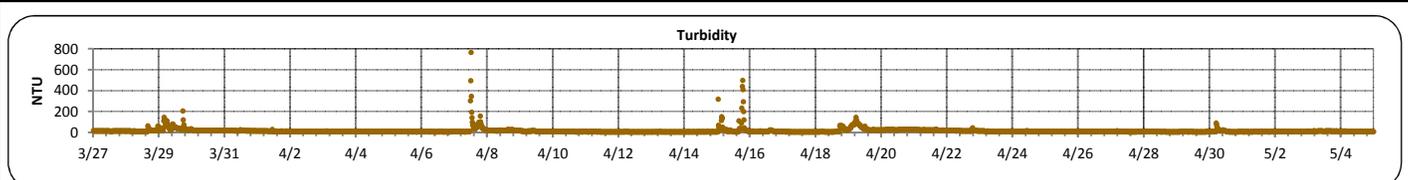
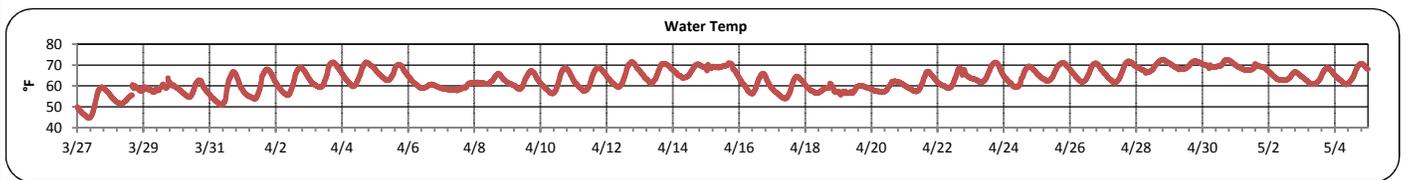
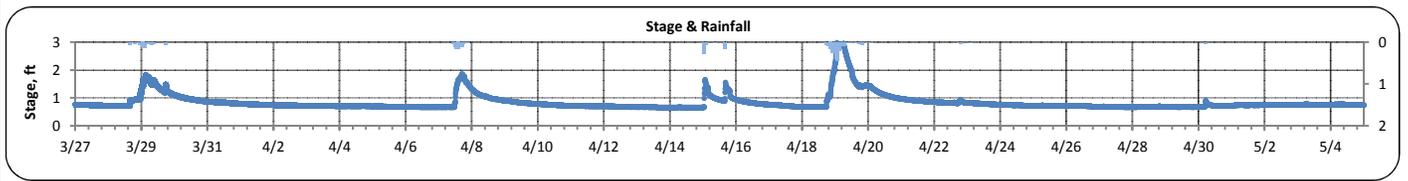
**Grab Sample Data:**

Analyte (units)	Sample 1		Sample 2		Sample 3	
	4/28/2014					
	Time	Result	Time	Result	Time	Result
<i>Escherichia coli</i> (MPN/100mL)	16:06	1722.0				
Total Suspended Solids (mg/L)						
Total Phosphorus (mg/L)						
Total Nitrogen (mg/L)						

Note: One sample of *E. coli* was collected to establish baseline conditions for the stream.

**Kinley Creek B (Mar 27 -- May 5, 2014)**

PARAMETER	DESCRIPTION	CONTINUOUS WATER QUALITY PARAMETERS:	SUMMARY STATISTICS				
			MINIMUM OBSERVED	MAXIMUM OBSERVED	MEDIAN OBSERVED	MEAN OBSERVED	STANDARD DEVIATION
STREAM NAME:	Kinley Creek	STAGE (FT):	0.7	1.8	0.7	0.9	0.3
LOCATION:	Broken Hill Rd	TEMPERATURE (°F):	45	74	63	63	5
ADDRESS:	609 Broken Hill Rd Columbia, SC 29212	TURBIDITY (NTU):	5	764	10	15	26
COORDINATES:	34.06635, -81.159986	pH:	6.3	7.5	7.0	7.0	0.1
TMDL/IMPAIRMENT:	Fecal Coliform	SPECIFIC CONDUCTIVITY (mS/cm):	0.027	0.231	0.164	0.158	0.031
NEIGHBORING LANDUSE:	Residential and commercial	DISSOLVED OXYGEN (mg/L):	4.7	11.8	7.3	7.5	1.4
SPATIAL LOCATION:	Most downstream site						
TOTAL NO. STORMS OVER 0.1 INCH:	6						
MAX. DAILY RAINFALL:	1.4 inches						
TOTAL RAINFALL (FOR PERIOD):	4.8 inches						



Note: Data gaps appear when the sonde is removed for calibration or when the flow depth is below the sensors

**Explanation of Statistics:**

<b>MINIMUM OBSERVED</b>	The minimum of the values recorded by the datasonde in 15 minute intervals.
<b>MAXIMUM OBSERVED</b>	The maximum of the values recorded by the datasonde in 15 minute intervals.
<b>MEDIAN OBSERVED</b>	The median of all the values recorded by the datasonde in 15 minute intervals.
<b>MEAN OBSERVED</b>	The average of all the values recorded by the datasonde in 15 minute intervals.
<b>STANDARD DEVIATION</b>	The standard deviation of all the values recorded by the datasonde in 15 minute intervals.

**Sampled Data:**

Analyte (units)	Sample 1		Sample 2		Sample 3	
	Time	Result	Time	Result	Time	Result
<i>Escherichia coli</i> (MPN/100mL)	15:43	836				
Total Suspended Solids (mg/L)						
Total Phosphorus (mg/L)						
Total Nitrogen (mg/L)						

Note: One sample of *E. coli* was collected to establish baseline conditions for the stream.