Colorado Springs Utilities
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August 14, 2013

Board of Directors
Lower Arkansas Valley Water Conservancy District
801 Swink Avenue
Rocky Ford. CO 81067

RE: Pueblo Chieftain Water Quality Article

Dear LAVWCD Board of Directors:

Colorado Springs Utilities (Springs Utilities) read with interest the Pueblo Chieftain July 18, 2013 story regarding flow, sediment and *E. coli* data for Fountain Creek. It is our understanding that the conclusions contained in the story were drawn from an analysis of data found in the 2012 MS4 (stormwater) permit report filed by the City of Colorado Springs with the Colorado Department of Public Health and Environment (CDPHE). We have reviewed the MS4 report and plotted the data found therein as well as any additional relevant data we could locate, and have been unable to replicate the numbers reported in the newspaper story. We have requested the analysis that led to the conclusions in the story but have not received it at this time. Based on our analysis, we do not believe the data in the report supports any correlation between an increase in flows and/or pollutant concentrations in Fountain Creek and the dissolution of the Colorado Springs Stormwater Enterprise (SWENT) in 2010.

We would like to share our analysis with you and hope to begin a dialogue that will allow us to reach a shared understanding of what the raw data does, and does not, tell us, and what additional work, if any, may further inform the situation.

Using data from the USGS continuous recording stations along Fountain Creek, we found no increase in average or peak flows when comparing 2009 flows to 2012 flows, i.e., SWENT and post-SWENT years, as referenced in the Chieftain story. This is depicted in the three attached charts (Appendices 1-3), which, in fact, show a slight downward trend in average and peak flows.

Obviously, there will be a varying number of "peak days" recorded in any given year. This is simply based upon the random occurrence of storm events. However, Springs Utilities could not locate any evidence upon which a conclusion can be reached that a storm event in 2009 (during SWENT) of a given magnitude produced a significantly different flow than a comparable event in 2012 (post-SWENT) as a result of the absence of detention facilities that "may" have been built if SWENT had been in existence. Obviously, making such a comparison on a storm- by- storm basis is fraught with peril given the variable nature of Front Range summer "monsoon" events where isolated storm cells can drop significant precipitation at very specific locations that do not necessarily reflect the actual point of flow measurement.

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For example, a significant rainfall event in August of 2008 (1.48") resulted in a sustained peak flow at Security of approximately 6000 cfs, while only about one-half of that flow level was recorded at the Pueblo gauge. However, a single, short duration storm event in July 2010 of approximately 1.2" resulted in an instantaneous peak flow of almost 8000cfs at Security, but a peak of about only 1550 cfs at Pueblo. This would indicate that a number of factors are at work, including exactly where the storm event is centered, the intensity and duration of the storm, and even whether water rights are being exercised in the same manner during the storm occurrences.

Relative to *E. coli* densities, Springs Utilities has graphed the available data for the 2008-2012 period, and it demonstrates, if anything, a slight downward trend at the Security gauge during the summer months of these years (Appendix 4). The graphs also demonstrate that *E. coli* densities are not well correlated with flow levels (Appendices 5-6, Fountain Creek at Highway 50 and Fountain Creek at Pinon). Naturally, many factors may influence *E. coli* densities in a particular stream reach, including land use activities unrelated to a stormwater regulatory program, and the presence of waterfowl and other bird species. That said, point sources, including Springs Utilities' wastewater reclamation facilities, must always be prepared to meet their E. coli permit effluent limitations.

Drawing any conclusions from the sediment data is even more complex. The 2007-2012 time series at the Security gauge (Appendix 7) would appear to show a small upward trend beginning in 2010. However, upon closer examination, this simply reflects the fact that there were higher peak events in 2010-2012, i.e., more intense storms, which naturally move more sediment. In fact, when the 2007-2012 sediment data are plotted against flow (Appendices 8 and 9), the 2010-2012 data are actually concentrated below the approximate trend line for the 2007-2009 data. That is to say, for the 2010-2012 period, there is a lower sediment concentration associated with a given flow rate when compared to the 2007-2009 data.

The majority of the above observations are based on data collected at the Security gauge, which is the farthest downstream gauge used in the MS4 report. However, it may be valuable to examine more closely the "Pueblo" USGS monitoring records, as these may be of greater direct interest to the Pueblo area and downstream communities. Unfortunately, a preliminary analysis of this site by Springs Utilities revealed that sediment and *E. coli* measurements were not necessarily taken at the same frequency or on the same dates as they were at the Security gauge. This makes it difficult to draw any conclusions.

The observations above should be considered in the context of the soon to be released USGS "Fountain Creek Peak Flow and Sediment Study," which was funded by the SDS participants. Though it is estimated that the final version of the study will not to be available until this December, the USGS has presented preliminary results to the Fountain Creek Watershed Flood Control and Greenway District (FCWFCGD). Representatives of Springs Utilities were present for the presentation. As noted in the USGS presentation, the study objective was "to assess the effectiveness of various management strategies to attenuate storm flows and to control the erosional and depositional effects of sediment transport." The USGS developed a fairly complex model encompassing the Fountain Creek basin and ran thirteen (13) separate "scenarios" in which varying numbers of detention facilities were constructed in an effort to reduce peak flows and sediment transport "in Pueblo". Scenario #1 had seven detention facilities (3,520 a/f total), all in El Paso County, while scenario #8 had forty-four detention facilities (30,500 a/f total), six of which were in Pueblo County. Scenario #12 had only ten detention facilities (13,250 a/f), but six of the ten were within Pueblo County. What is most telling and interesting relative to potential future

planning, is that the modeling indicates that the FCWFCGD could construct as many as thirty-four facilities in El Paso County and not have the type of significant effect on peak flows (24.9% reduction) and sediment (8.6% reduction) that the USGS was attempting to identify. Yet, with scenario #12 and the ten facilities, where the majority of facilities are constructed in Pueblo County, there was a significant reduction in both peak flows (47.7%) and sediment loading (62.1%).

The above USGS modeling effort further supports the conclusion that no valid correlation can be drawn between any increase in flows or sediment loading, even if such increases were recorded, and the existence or non-existence of SWENT during the years referenced in the Chieftain story. That is to say, while local infrastructure investments within Colorado Springs outside the context of any permit requirements may have benefited Colorado Springs' residents, the few actual detention facilities that "may" have been constructed by the Enterprise in those three years (2010-2012) would have had no significant impact on flows or sediment loads in Pueblo or below Pueblo. However, the preliminary USGS results do indicate that a dialogue over the future construction of detention facilities within Pueblo County, under the auspices of the FCWFCGD, is a concept that merits future investigation.

Springs Utilities would like to reiterate that it takes stormwater control and water quality within the Fountain Creek basin very seriously, as the basin represents one of Springs Utilities' water supply sources and a community amenity. While the Pueblo County 1041 permit for the Southern Delivery System does not require any set monetary amount of stormwater control investments or the construction of any identified list of infrastructure projects, the SDS participants must ensure that once the SDS project is operational there must be in place "controls and other regulations intended to ensure that Fountain Creek peak flows resulting from new development served by the SDS project within the Fountain Creek basin are no greater than existing conditions." Springs Utilities and its partners shall meet that commitment.

Finally, Springs Utilities has been an active participant in the formation of the Arkansas Fountain Coalition for Urban River Evaluation (AF Cure), a consortium of local entities, including the City of Pueblo, dedicated to water quality monitoring and water quality improvement in the Fountain Creek watershed. Springs Utilities has also indicated to the USGS its interest in funding, along with other interested parties, "post-fire/post storm event" water quality monitoring in order to evaluate the impacts of the Waldo Canyon and Black Forest fires. This is in addition to the continuation of the water quality monitoring activities established under the 1041 permit.

Springs Utilities hopes that this material proves of benefit to the Lower District in evaluating the stormwater/water quality/water quantity nexus. Springs Utilities would be glad to attend the District's September Board meeting and provide both any further explanation of the data we have examined, and an update on local Stormwater Steering Committee activities. In addition, Springs Utilities staff would be available to meet with any of the District's water quality consultants in the interim should you believe that would be useful.

Thank you for your attention to the matter.

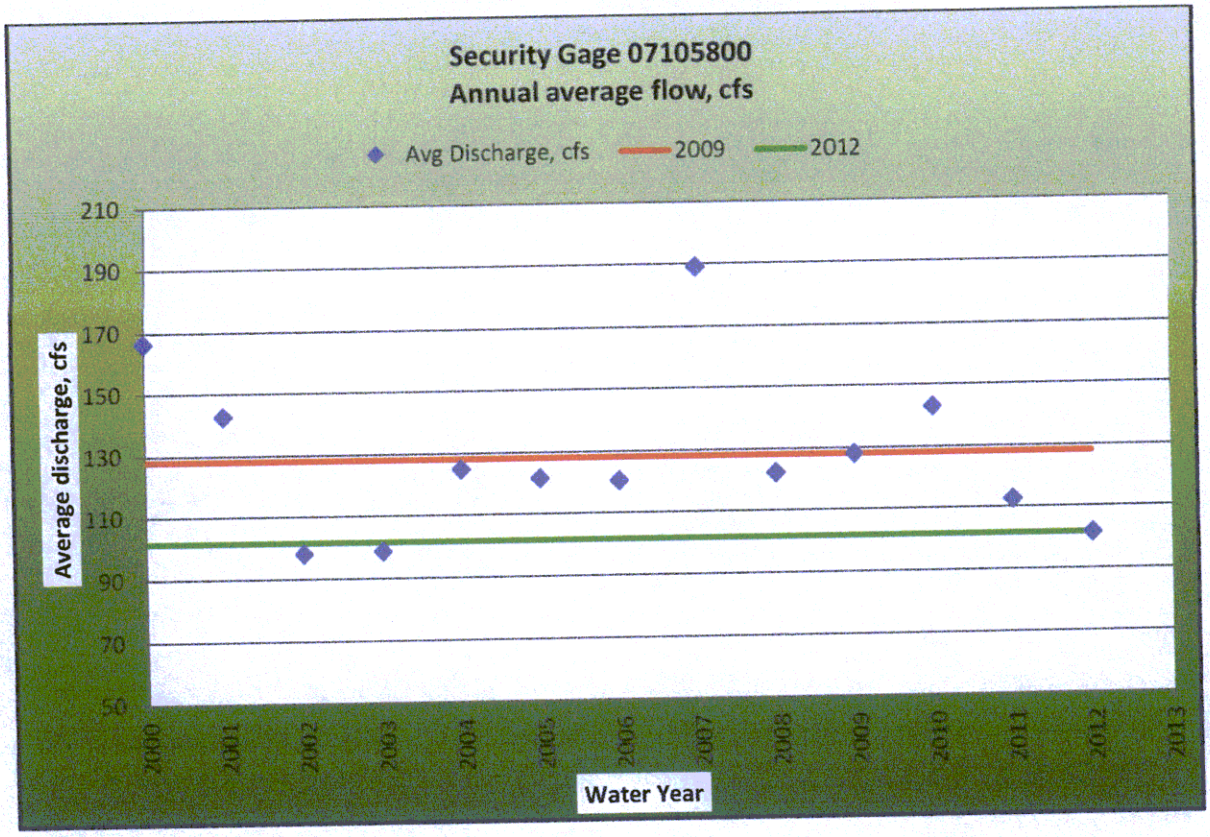
Sincerely,

Mark Pifher
SDS Permitting Manager
Colorado Springs Utilities

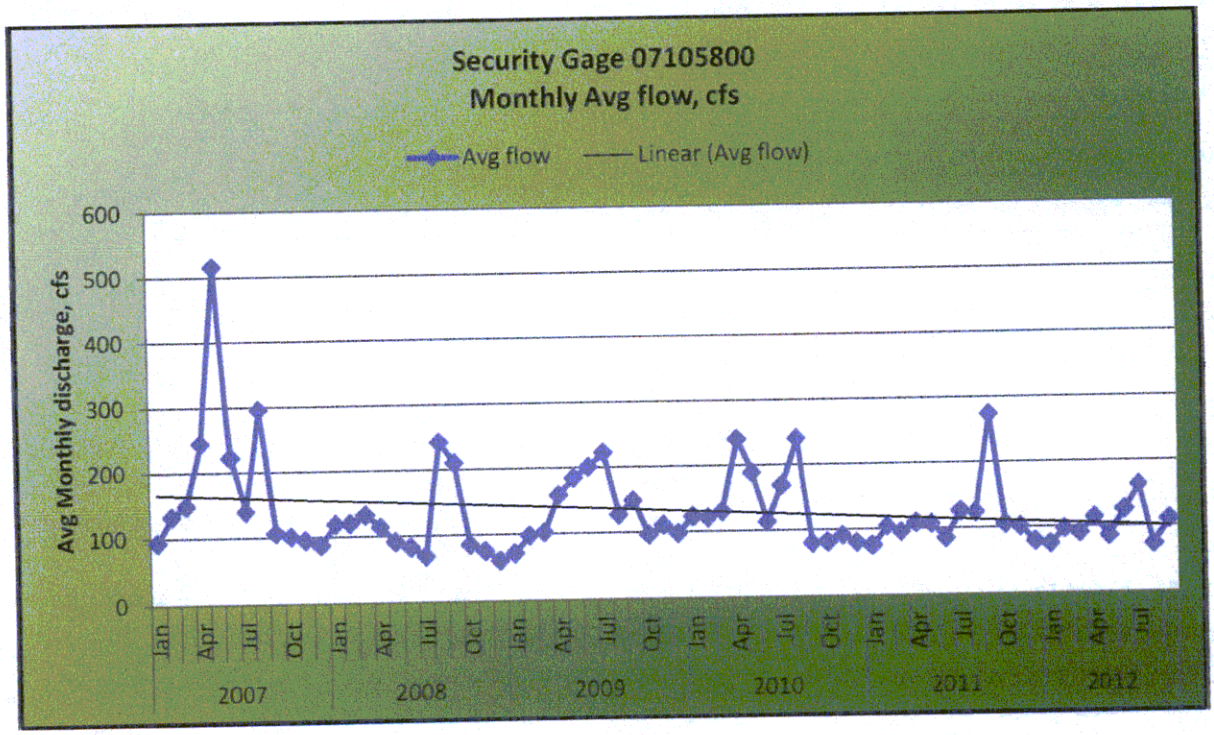
Attachments: Appendices 1 through 9

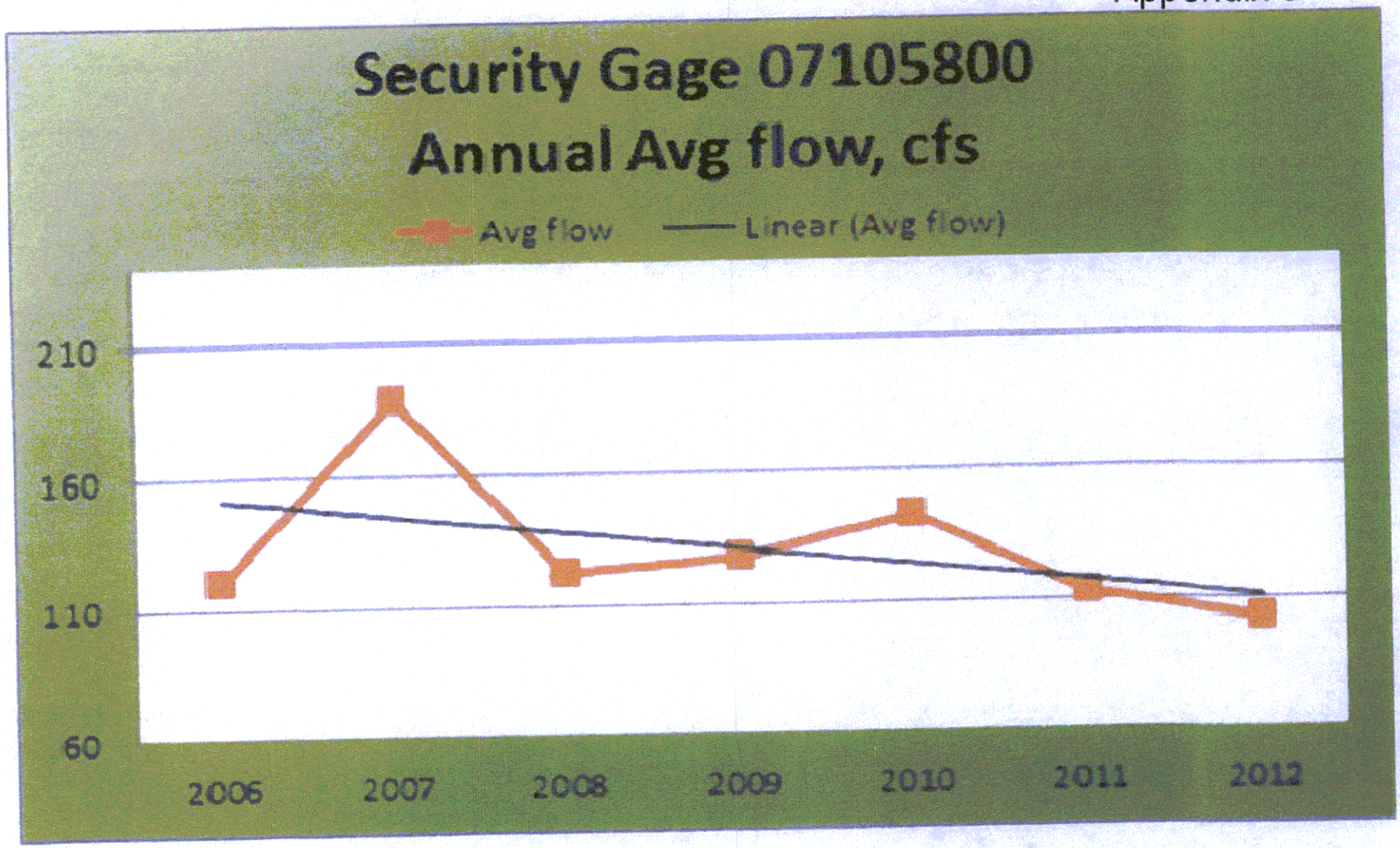
cc: Jay Winner, Executive Director LAVWCD
Peter Nichols, Attorney

Appendix 1

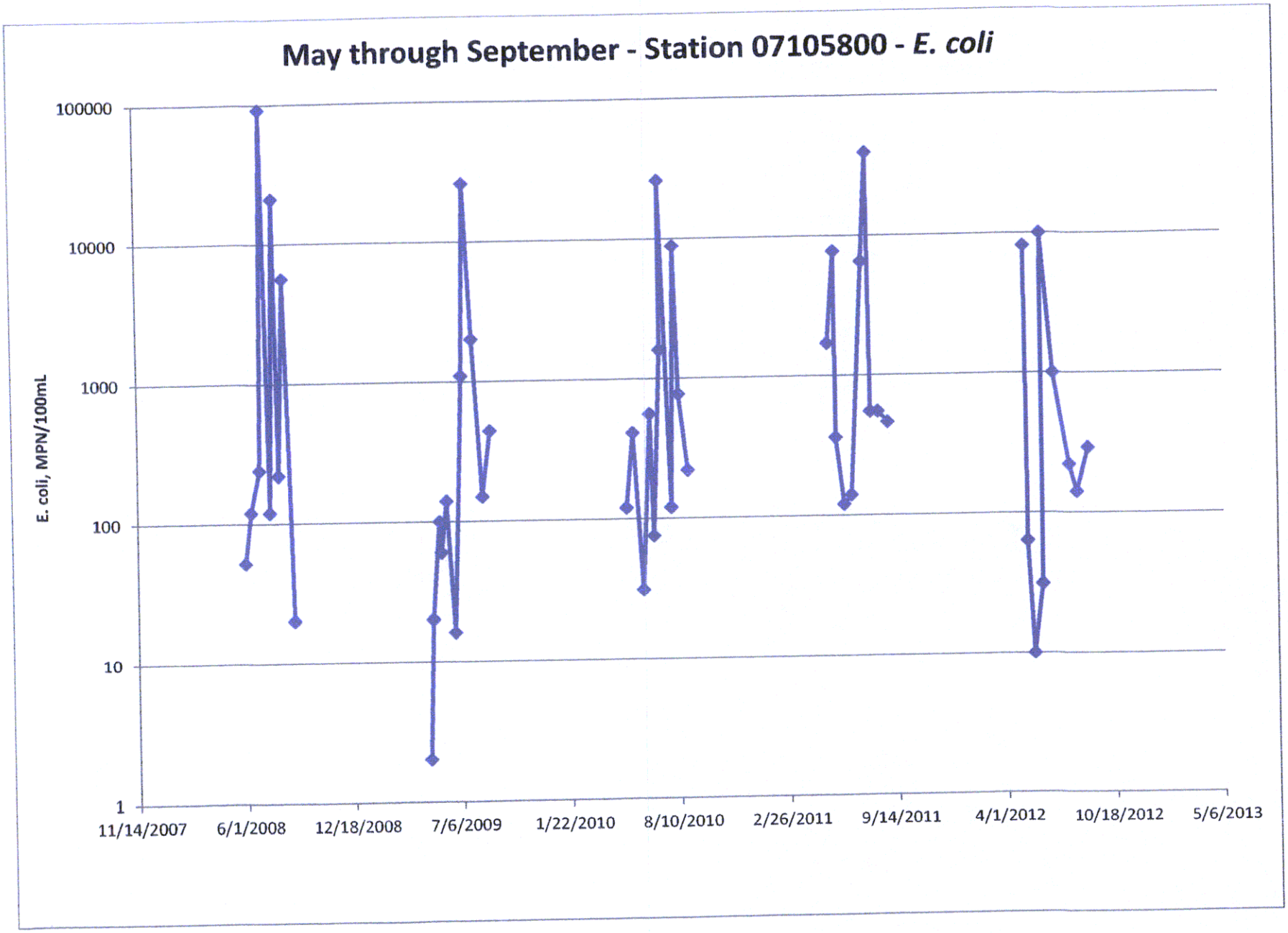


Appendix 2



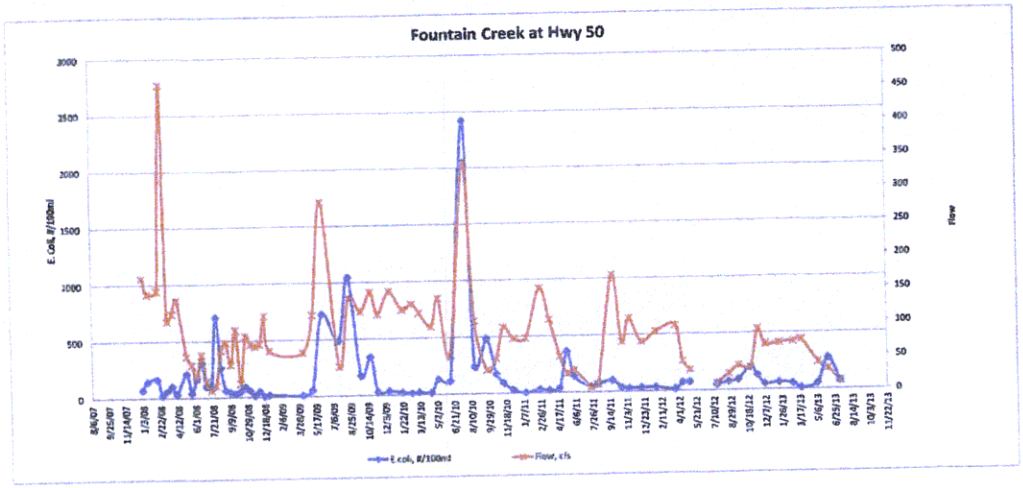

Security Gage 07105800
Annual Avg flow, cfs
Avg flow
Linear (Avg flow)
210
160
110
60
2006
2007
2008
2009
2010
2011
2012

Appendix 4


May through September - Station 07105800 - E. coli
E. coli, MPN/100mL
100000
10000
1000
100
10
1
11/14/2007
6/1/2008
12/18/2008
7/6/2009
1/22/2010
8/10/2010
2/26/2011
9/14/2011
4/1/2012
10/18/2012
5/6/2013

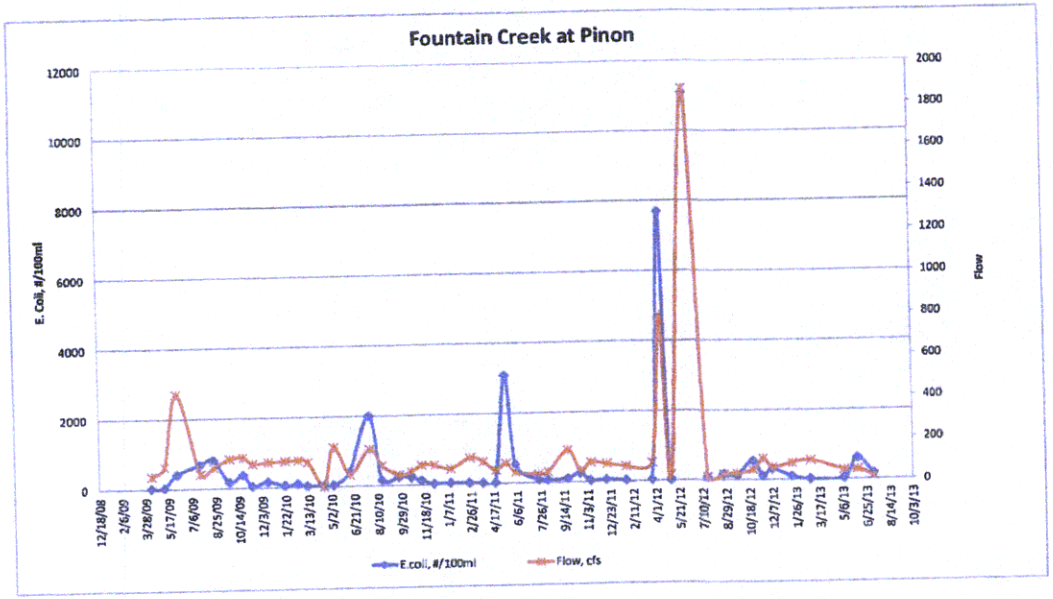
Appendix 5

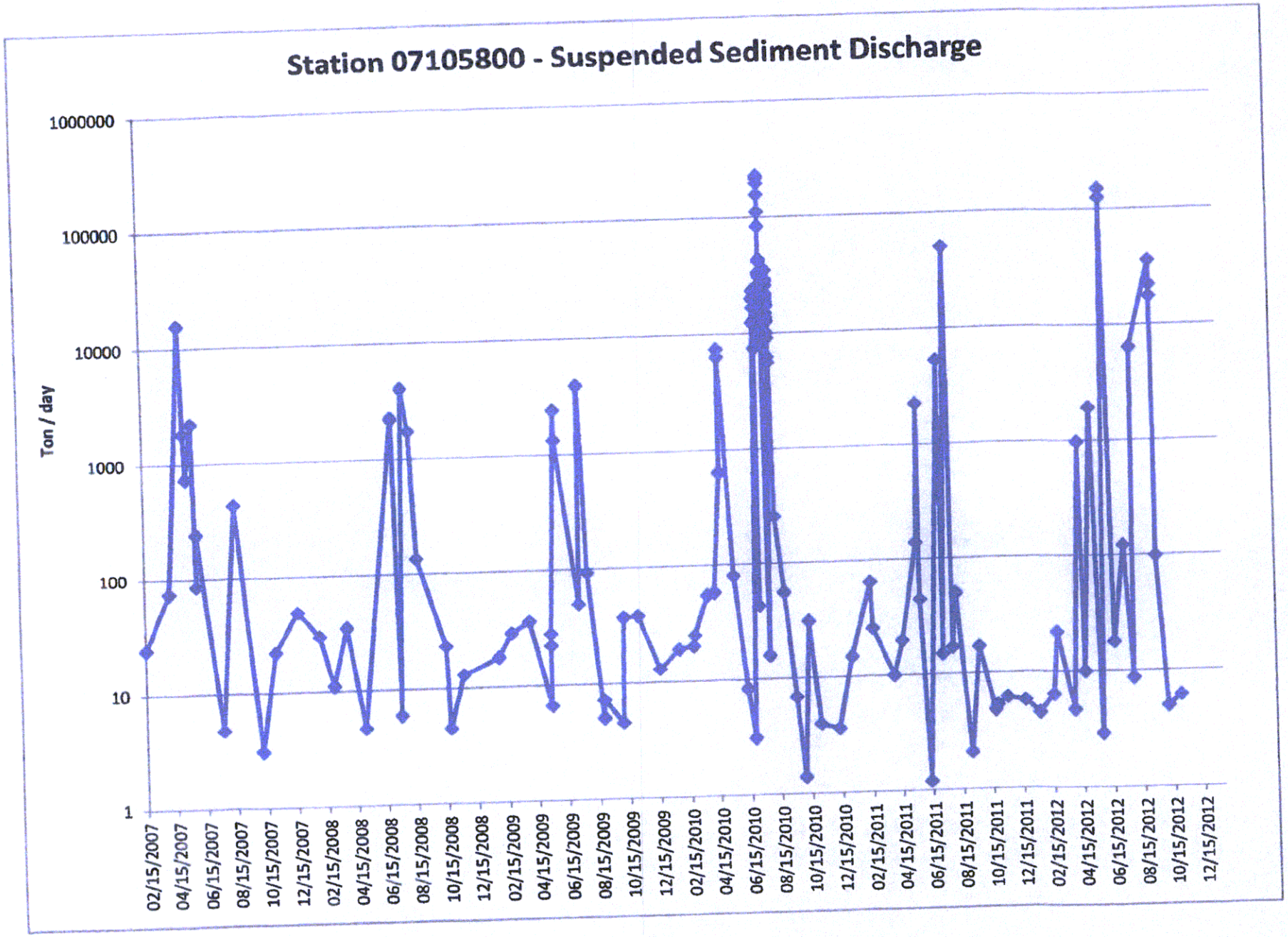
Sample No	Description	Date Sampled	E. Coli, Colilert, #/100 ml	Flow, cfs	Method
1033-08	Fountain Creek at Hwy 50	1/2/08	67.7	177	9223 B
1051-08	Fountain Creek at Hwy 50	1/16/08	142	153	9223 B
1098-08	Fountain Creek at Hwy 50	2/13/08	161	158	9223 B
1119-08	Fountain Creek at Hwy 50	2/27/08	18.3	462	9223 B
1138-08	Fountain Creek at Hwy 50	3/12/08	60.2	113	9223 B
1158-08	Fountain Creek at Hwy 50	3/26/08	101	124	9223 B
1176-08	Fountain Creek at Hwy 50	4/9/08	34.1	144	9223 B
1216-08	Fountain Creek at Hwy 50	5/7/08	214	61	9223 B
1233-08	Fountain Creek at Hwy 50	5/21/08	40.4	48	9223 B
1253-08	Fountain Creek at Hwy 50	6/4/08	172	28	9223 B
1270-08	Fountain Creek at Hwy 50	6/18/08	308	65	9223 B
1290-08	Fountain Creek at Hwy 50	7/2/08	101	23	9223 B
1315-08	Fountain Creek at Hwy 50	7/16/08	86	9.8	9223 B
1332-08	Fountain Creek at Hwy 50	7/30/08	712	17	9223 B
1353-08	Fountain Creek at Hwy 50	8/13/08	263	70	9223 B
1370-08	Fountain Creek at Hwy 50	8/27/08	63.1	81	9223 B
1391-08	Fountain Creek at Hwy 50	9/10/08	45	48	9223 B
1412-08	Fountain Creek at Hwy 50	9/24/08	29.2	99	9223 B
1431-08	Fountain Creek at Hwy 50	10/8/08	51.2	20	9223 B
1450-08	Fountain Creek at Hwy 50	10/22/08	88.2	90	9223 B
1468-08	Fountain Creek at Hwy 50	11/5/08	57.3	78	9223 B
1489-08	Fountain Creek at Hwy 50	11/19/08	13.4	75	9223 B
1509-08	Fountain Creek at Hwy 50	12/3/08	49.5	78	9223 B
1533-08	Fountain Creek at Hwy 50	12/17/08	5.2	120	9223 B
1550-08	Fountain Creek at Hwy 50	12/31/08	14.6	88	9223 B
1684-05	Fountain Creek at Hwy 50	4/9/09	8.4	65	9223 B
1725-05	Fountain Creek at HWY 50	5/7/09	53.7	120	9223 B
1762-05	Fountain Creek at Hwy 50	6/4/09	727	286	9223 B
1822-05	Fountain Creek at HWY 50	7/13/09	488	43	9223 B
1863-05	Fountain Creek at HWY 50	8/20/09	1050	144	9223 B
1907-05	Fountain Creek at Hwy 50	9/24/09	172	124	9223 B
1947-05	Fountain Creek at Hwy 50	10/22/09	345	152	9223 B
1972-05	Fountain Creek at HWY 50	11/12/09	28.8	120	9223 B
2015-05	Fountain Creek at HWY 50	12/15/09	37.9	153	9223 B
2069-05	Fountain Creek at HWY 50	1/21/10	21.6	126	9223 B
2104-05	Fountain Creek at HWY 50	2/18/10	13.4	134	9223 B
2131-05	Fountain Creek at Hwy 50	3/11/10	23.6	121	9223 B
2173-05	Fountain Creek at Hwy 50	4/15/10	16.9	100	9223 B
2201-05	Fountain Creek at HWY 50	5/6/10	133	142	9223 B
2248-05	Fountain Creek at Hwy 50	6/10/10	115	58	9223 B
2303-05	Fountain Creek at HWY 50	7/22/10	2420	343	9223 B
2341-05	Fountain Creek at HWY 50	8/19/10	238	108	9223 B
2382-05	Fountain Creek at Hwy 50	9/23/10	488	35	9223 B
2418-05	Fountain Creek at Hwy 50	10/21/10	172	52	9223 B
2465-05	Fountain Creek at HWY 50	11/11/10	90.8	98	9223 B
2500-05	Fountain Creek at HWY 50	12/9/10	29.5	81	9223 B
2546-05	Fountain Creek at HWY 50	1/13/11	2	81	9223 B
2604-05	Fountain Creek at HWY 50	2/24/11	27.5	134	9223 B
2645-05	Fountain Creek at Hwy 50	3/24/11	20.3	108	9223 B
2683-05	Fountain Creek at Hwy 50	4/21/11	36.4	54	9223 B
2709-05	Fountain Creek at HWY 50	5/12/11	365	28	9223 B
2738-05	Fountain Creek at Hwy 50	6/2/11	140	33	9223 B
2802-05	Fountain Creek at HWY 50	7/21/11	48.7	7	9223 B
2827-05	Fountain Creek at HWY 50	8/11/11	67.7	11	9223 B
2868-05	Fountain Creek at Hwy 50	9/22/11	95.9	172	9223 B
2921-05	Fountain Creek at Hwy 50	10/19/11	33.6	73	9223 B
2947-05	Fountain Creek at HWY 50	11/10/11	26.9	108	9223 B
2993-05	Fountain Creek at HWY 50	12/15/11	28.8	73	9223 B
3026-05	Fountain Creek at HWY 50	1/16/12	32.7	88	9223 B
3119-05	Fountain Creek at Hwy 50	3/22/12	14.5	97	9223 B
3145-05	Fountain Creek at Hwy 50	4/12/12	73.2	44	9223 B
3169-05	Fountain Creek at HWY 50	5/3/12	71.7	31	9223 B
3214-05	Fountain Creek at Hwy 50	6/7/12	14400	914	9223 B
3270-05	Fountain Creek at HWY 50	7/19/12	47.1	10	9223 B
3312-05	Fountain Creek at HWY 50	8/23/12	73.8	24	9223 B
3348-05	Fountain Creek at Hwy 50	9/20/12	90.9	36	9223 B
3390-05	Fountain Creek at Hwy 50	10/25/12	196	33	9223 B
3417-05	Fountain Creek at HWY 50	11/15/12	125	89	9223 B
3445-05	Fountain Creek at HWY 50	12/5/12	48.7	67	9223 B
3499-05	Fountain Creek at HWY 50	1/17/13	60.5	69	9223 B
3550-05	Fountain Creek at HWY 50	2/26/13	49.5	71	9223 B
3578-05	Fountain Creek at Hwy 50	3/21/13	9.8	73	9223 B
3639-05	Fountain Creek at HWY 50	5/8/13	51.2	40	9223 B
3672-04	Fountain Creek at HWY 50	6/6/13	276	30	9223 B
3718-04	Fountain Creek at HWY 50	7/10/13	69.5	12	9223 B



Appendix 6

Sample No.	Description	Date Sampled	E. Coli, Colilert, #/100 ml	Flow, cfs	Method
1684-06	Fountain Creek at Pinon Bridge	4/9/09	18.5	61	9223 B
1725-06	Fountain Creek at Pinon Bridge	5/7/09	30.5	106	9223 B
1762-06	Fountain Creek at Pinon Bridge	6/4/09	411	450	9223 B
1822-06	Fountain Creek at Pinon Bridge	7/23/09	687	69	9223 B
1863-06	Fountain Creek at Pinon Bridge	8/20/09	816	100	9223 B
1907-06	Fountain Creek at Pinon Bridge	9/24/09	172	140	9223 B
1947-06	Fountain Creek at Pinon Bridge	10/22/09	370	145	9223 B
1972-06	Fountain Creek at Pinon Bridge	11/12/09	50.4	115	9223 B
2016-06	Fountain Creek at Pinon Bridge	12/15/09	172	120	9223 B
2069-06	Fountain Creek at Pinon Bridge	1/21/10	52.1	125	9223 B
2104-06	Fountain Creek at Pinon Bridge	2/18/10	91	127	9223 B
2131-06	Fountain Creek at Pinon Bridge	3/11/10	29.8	119	9223 B
2177-06	Fountain Creek at Pinon Bridge	4/15/10	37.3	2.2	9223 B
2201-06	Fountain Creek at Pinon Bridge	5/6/10	38.4	187	9223 B
2248-06	Fountain Creek at Pinon Bridge	6/10/10	411	55	9223 B
2303-06	Fountain Creek at Pinon Bridge	7/22/10	1990	174	9223 B
2341-06	Fountain Creek at Pinon Bridge	8/19/10	162	96	9223 B
2382-06	Fountain Creek at Pinon Bridge	9/23/10	238	50	9223 B
2418-06	Fountain Creek at Pinon Bridge	10/21/10	219	64	9223 B
2465-06	Fountain Creek at Pinon Bridge	11/11/10	127	94	9223 B
2500-06	Fountain Creek at Pinon Bridge	12/9/10	26.2	94	9223 B
2546-06	Fountain Creek at Pinon Bridge	1/13/11	35.9	74	9223 B
2604-06	Fountain Creek at Pinon Bridge	2/24/11	31.8	125	9223 B
2645-06	Fountain Creek at Pinon Bridge	3/24/11	24.1	106	9223 B
2683-06	Fountain Creek at Pinon Bridge	4/21/11	26.2	63	9223 B
2709-06	Fountain Creek at Pinon Bridge	5/12/11	3080	96	9223 B
2738-06	Fountain Creek at Pinon Bridge	6/2/11	548	53	9223 B
2802-06	Fountain Creek at Pinon Bridge	7/21/11	93.3	41	9223 B
2827-06	Fountain Creek at Pinon Bridge	8/11/11	69.7	50	9223 B
2883-06	Fountain Creek at Pinon Bridge	9/22/11	105	153	9223 B
2921-06	Fountain Creek at Pinon Bridge	10/19/11	248	53	9223 B
2947-06	Fountain Creek at Pinon Bridge	11/10/11	35.9	94	9223 B
2993-06	Fountain Creek at Pinon Bridge	12/15/11	52	85	9223 B
3026-06	Fountain Creek at Pinon Bridge	1/26/12	26.2	72	9223 B
3119-06	Fountain Creek at Pinon Bridge	3/22/12	34.5	88	9223 B
3145-06	Fountain Creek at Pinon Bridge	4/12/12	7700	787	9223 B
3169-06	Fountain Creek at Pinon Bridge	5/3/12	16	29	9223 B
3214-06	Fountain Creek at Pinon Bridge	6/7/12	11100	1870	9223 B
3270-06	Fountain Creek at Pinon Bridge	7/19/12	79.4	15	9223 B
3312-06	Fountain Creek at Pinon Bridge	8/23/12	172	28	9223 B
3348-06	Fountain Creek at Pinon Bridge	9/20/12	119	30	9223 B
3390-06	Fountain Creek at Pinon Bridge	10/25/12	548	47	9223 B
3417-06	Fountain Creek at Pinon Bridge	11/15/12	101	101	9223 B
3445-06	Fountain Creek at Pinon Bridge	12/6/12	299	60	9223 B
3499-06	Fountain Creek at Pinon Bridge	1/17/13	98.8	79	9223 B
3550-06	Fountain Creek at Pinon Bridge	2/26/13	18.7	91	9223 B
3639-06	Fountain Creek at Pinon Bridge	5/8/13	38.4	44	9223 B
3677-01	Fountain Creek at Pinon Bridge	6/6/13	613	46	9223 B
3718-01	Fountain Creek at Pinon Bridge	7/10/13	162	15	9223 B




Station 07105800 - Suspended Sediment Discharge
Ton / day
1000000
100000
10000
1000
100
10
1
02/15/2007
04/15/2007
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08/15/2007
10/15/2007
12/15/2007
02/15/2008
04/15/2008
06/15/2008
08/15/2008
10/15/2008
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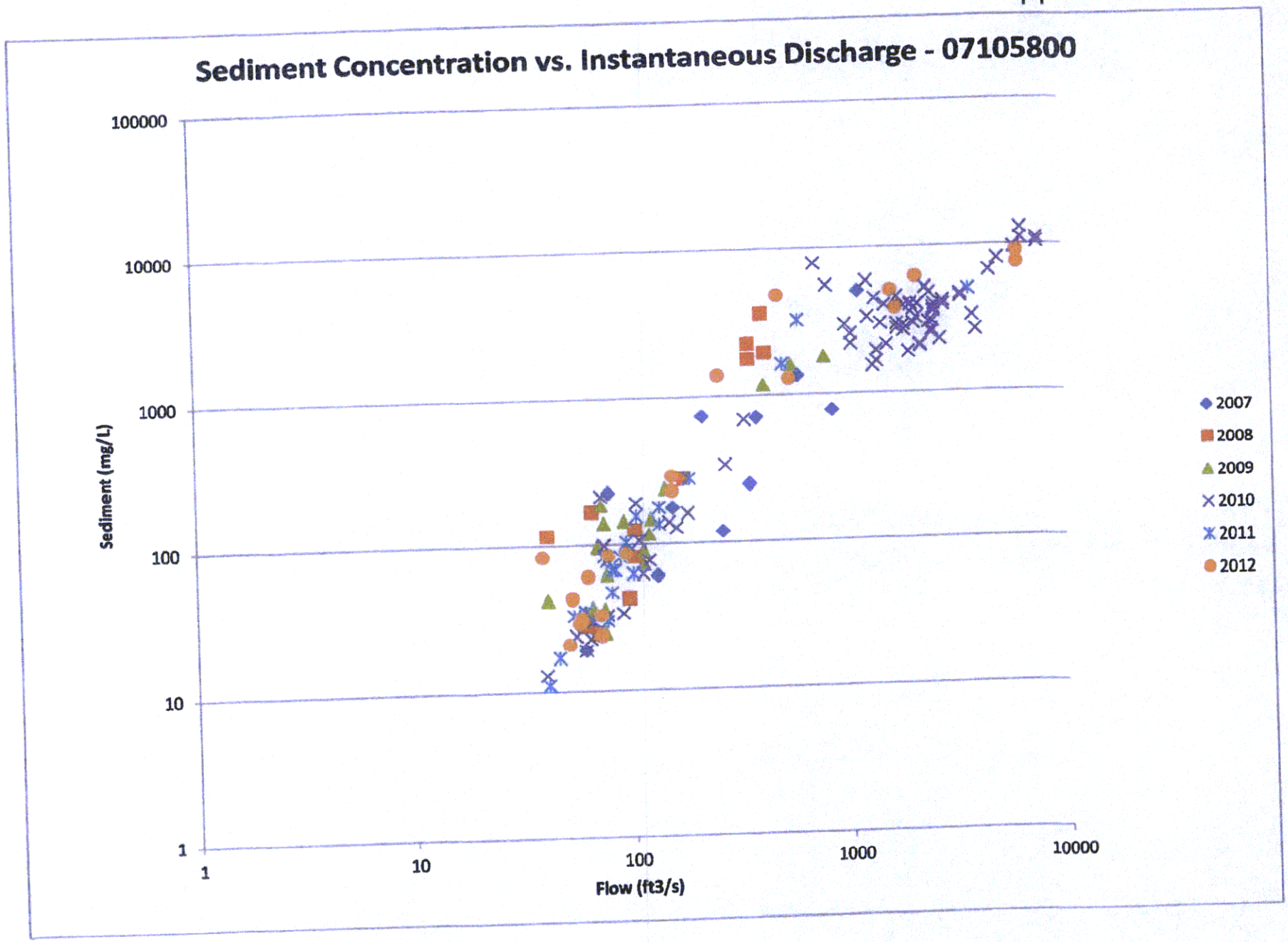
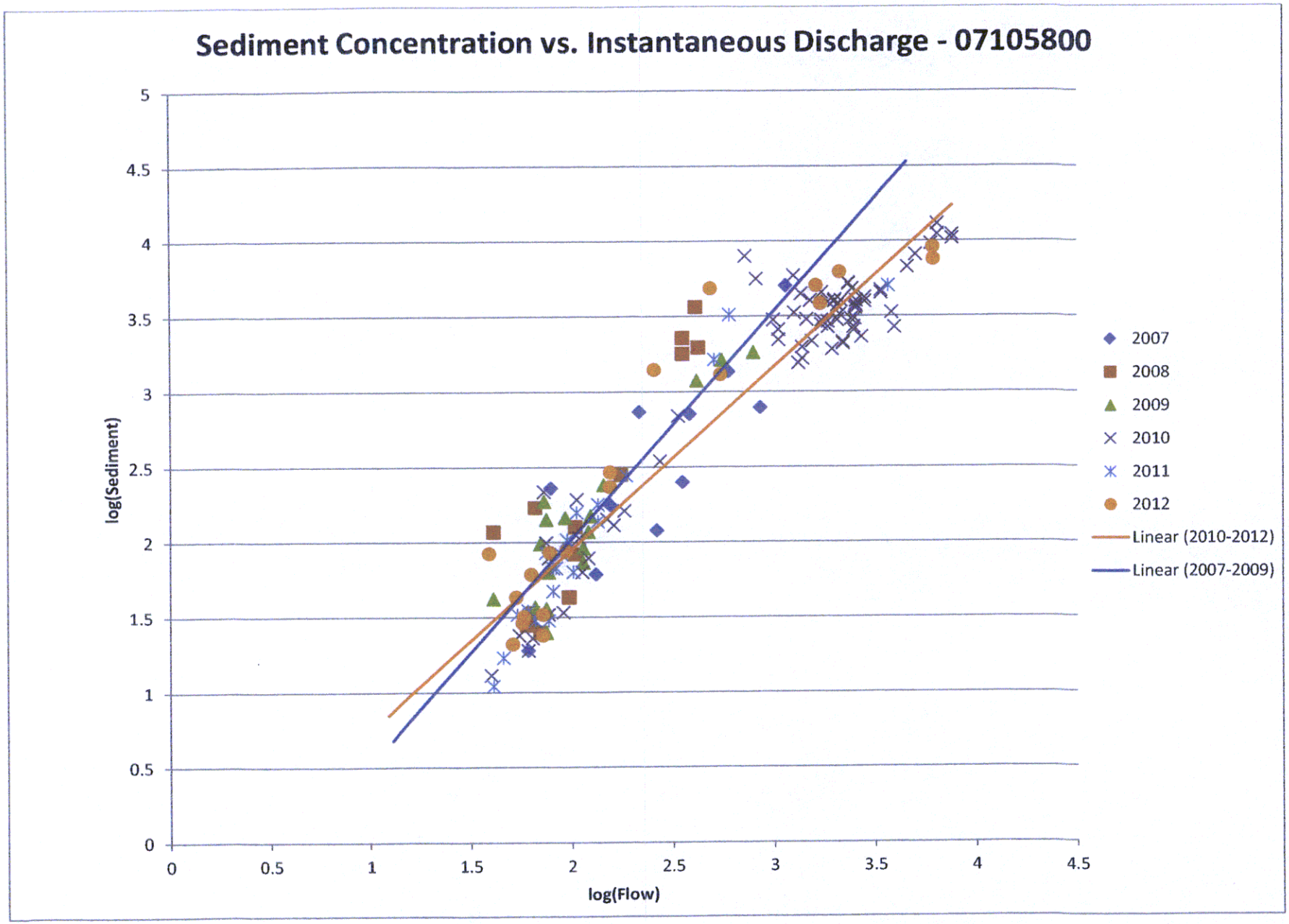
12/15/2012


Sediment Concentration vs. Instantaneous Discharge - 07105800
100000
10000
1000
100
10
1
Sediment (mg/L)
1
10
100
1000
10000
Flow (ft3/s)
2007
2008
2009
2010
2011
2012


Sediment Concentration vs. Instantaneous Discharge - 07105800
log(Sediment)
log(Flow)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
2007
2008
2009
2010
2011
2012
Linear (2010-2012)
Linear (2007-2009)