

**BASELINE STORMWATER MONITORING IN
SELECTED STREAM LOCATIONS AT CALVERT
CLIFFS NUCLEAR POWER PLANT**

Prepared for:

Unistar Nuclear Development, LLC
Baltimore, Maryland

Prepared by:

EA Engineering, Science & Technology, Inc.
15 Loveton Circle
Sparks, MD 21152

July 2010
EA Project No. 14621.04

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1. INTRODUCTION

A study was conducted to document the effects of stormwater runoff in selected stream locations at Calvert Cliffs Nuclear Power Plant (CCNPP). The study was conducted to collect baseline or existing conditions data as associated with stormwater runoff within the streams located on the CCNPP property. Ten locations throughout the CCNPP property were selected to monitor stormwater runoff events. These ten sample locations were associated with three separate watersheds within the property. Five locations were located in the John's Creek watershed, three in the Woodland Branch watershed and two were streams that discharged directly to the Chesapeake Bay.

The objective of the study was to collect data from three storm events from late August 2009 to the end of October 2009. For sufficient data collection, it was predetermined that a qualifying precipitation event must equate to a minimum of 1 inch of rain during a 24 hour period.

Water samples were collected for chemical and physical analysis at each site. Flow data were collected at each of the sites at the time of sampling. In addition, continuous flow measurement instruments were deployed at two of the sample sites throughout the study period. A rain gauge was set up on site to collect site specific precipitation data.

2. PROCEDURES

During three separate rain events, water samples were collected at the ten sample locations and transported to a Microbac Laboratory for analysis of Biological Oxygen Demand (BOD), Total Nitrogen, Nitrate/Nitrite, Total Phosphorus, Total Kjeldahl Nitrogen, Total Suspended Solids, pH, and Turbidity. In addition, flow measurements were collected at each station periodically and level/ velocity meters were deployed at two of the sample locations throughout the study period. These data were used in conjunction with the laboratory data to establish baseline conditions of streams during a stormwater runoff event.

2.1 Site Selection

Ten sample locations were identified throughout the CCNPP property. The ten sample site locations were assigned an identification letter ranging from A through J. GPS coordinates of each sample location are listed in Table 1 and presented in Figure 1. Site selection was based on providing adequate sampling coverage for streams that could potentially be affected by future construction activities. Selected sample locations covered three distinct watersheds. First, Woodland Branch located on the north end of the property. Woodland Branch is a tributary of the Patuxent River. Three sampling locations were selected within the Woodland Branch watershed (Stations SW-A-01, SW-B-01 and SW-C-01). Second, John's Creek watershed is the largest located on the CCNPP property and located in the mid to south end of the property. Goldstein Branch is a major tributary of John's Creek and flows into John's Creek just before exiting the property on the west side. Two sampling locations were selected on John's Creek (Stations SW-F-01 and SW-G-01) and three locations selected on Goldstein Branch (Stations SW-H-01, SW-I-01 and SW-J-01). Two small streams that discharge directly to the Chesapeake

Bay located on the east side of the property were also selected for sampling (Stations SW-D-01 and SW-E-01). These streams are not named on USGS maps.

2.2 Rain Gauge Deployment

An Onset Corporation tip bucket rain gauge was installed on August 12, 2009 to collect site specific precipitation data. The Gauge was set up near the basketball court at Camp Canoy. GPS coordinates for the rain gauge are located in Table 1 and presented in Figure 1. Precipitation data were recorded continuously from August 12 through October 31, 2009. Data from the rain gauge were downloaded before each sampling event to ensure that enough precipitation had occurred to qualify the event for sampling.

2.3 Water Sample Collection

During or soon after a qualifying rain event, EA staff accompanied by Unistar staff, conducted water sample collections from the ten sample locations on site. Samples were kept in a cooler on ice and transported to Microbac Laboratories in Baltimore, Maryland at the end of the day. Standard labeling and Chain-of-Custody protocols required by the laboratory were followed to ensure that the samples were accurate and representative of the conditions at the site.

An effort was made to conduct sampling for each of the three storm events at a different time of the precipitation event. The first rain event was sampled near the precipitation peak, the second event was collected after the peak of the event, and the third event was collected before the peak of a large precipitation event.

2.4 Flow Measurements

Flow data were collected using a hand held Marsh McBirney Flowmeter on a top set wading rod at sample locations at the same time the water samples were collected at each sample location. Flow measurements were recorded in a field notebook and used as supporting data for water samples and turbidity readings.

In addition to the Marsh McBirney readings, two Greyline Instruments Stingray flowmeters were deployed at two locations on site. One instrument was installed on John's Creek and one was installed on Woodland Branch. Velocity, level, and temperature were recorded at the two locations for the duration of the sampling effort. These data and subsequent processing were intended to show the time and intensity of the flow during the storm event and to put the water sample collection into perspective.

While excellent data were recorded by the meter in John's Creek, minimal data were recorded by the Woodland Branch meter do to a meter malfunction. Additional data were collected at Woodland Branch after the study period and were considered in the data evaluation process, but an insufficient amount was recorded to process in the flow analysis.

2.5 Data Analysis

Data collected during this study were analyzed to accurately report the conditions at the site during and after a rain event. The laboratory data were examined in comparison to data collected during a dry weather sampling event by EA Engineering, Science, and Technology during the Spring of 2006. Since these data were known existing data from the site, they were used to make a reference comparison from actual site data to the sampling data from this event. The 2006 data used in the comparison were data collected at Station SW-G-01 during that study. These data were tabulated and incorporated into this report (Table 3). Turbidity values were examined separately from the other laboratory data. Since turbidity values were of particular interest when associated with stormwater runoff at the site, these data are presented separately.

To document the conditions and response of the stream sampling locations to each rain event, precipitation data, hand collected flow measurements, and level and velocity data collected by the deployed meters were used to better understand the response of the streams on the site to stormwater runoff. Finally, data analysis for this study was conducted to supplement the baseline data and conditions. Data were used to clearly understand the existing conditions at the site.

3. RESULTS

Three rain events were successfully sampled during the period of this study. Laboratory and flow data were collected and analyzed to establish the conditions at the site during significant rain events. Water sampling occurred at nine of the ten sites. One site (Station SW-E-01) never had enough flow in it following a storm event to sample. On previous, unrelated visits to the site, flow was observed in this channel, but during the period of this study, no flow occurred.

Flow data collected at the site were used in comparison to precipitation data and turbidity data to establish the conditions at the site during and after a rain event. The meter on Woodland Branch malfunctioned during the project and provided little usable data. The meter located on John's Creek produced excellent data throughout the project.

3.1 Precipitation Data

The rain gauge deployed on site collected data from August 12 through October 31, 2009. Data collected show that five rain events occurred that would qualify as an event for sample collection. These events occurred on August 12, September 11, September 27, October 16, and October 27, 2009. A qualifying event was defined as an event over 1-inch in a 24 hour period. Three of these events were sampled by EA staff as per the scope of work. The events sampled occurred on or around September 11, September 27, and October 16, 2009. Precipitation data at the site for the entire period of the study are presented in Figure 2. The intensity of each event and the total amount of precipitation varied for each event. The September 11 event was the smallest amount of rain for the three events, totaling 1.13 inches for the entire event. The September 27 event was the second largest event sampled and totaled 1.91 inches. The third event sampled on October 16 was the largest rain event sampled. The total event produced 4.74

inches of rain; however, the actual sampling of the event occurred after approximately 1.55 inches had fallen.

3.2 Water Sampling Results

Turbidity and flow results for each station and each event are recorded in Table 2 and presented in Figures 3, 4 and 5. Average turbidity for the three events was also calculated and presented in Figure 6. Actual flow measurements and calculation of total flow are shown on Table 4.

The highest turbidity reading among all the events sampled was at station SW-C-01 on September 11 and measured 41 NTU. This station is located in Woodland Branch and is the furthest upstream station of the three stations sampled in this watershed. The lowest turbidity reading occurred at SW-D-01 during the September 28 sampling event and recorded a value of 1.3 NTU. Turbidity values in general were highest during the September 11 event, followed by the October 16 event, and lowest in general during the September 28 event. Since samples were collected at different periods of each of the three rain events sampling times and turbidity results can tell something about the duration of the turbidity levels and changes in flow created by each event. Figure 2 as well as Figures 7, 8 and 9 shows where, during the rain event, the sampling occurred. The September 11 event was conducted within hours after the rain event ended. By the time sampling was completed at 1640 hrs the total precipitation of 1.13 inches had fallen. The September 28 event was conducted a full day after the rain event ended. This event produced 1.91 inches of rain, yet the turbidity results are the lowest of the three events. This can be attributed to the difference in time after the rain ended and the time the samples were taken. The sampling of this event demonstrated that the turbidity levels (and subsequent flow levels) diminish relatively quickly after a rain event ends. Typically, small streams tend to be "flashy" in nature, meaning that flow and turbidity levels increase quickly and diminish quickly as well, showing little attenuation time, when compared to larger streams and rivers. The sampling event conducted on October 16 was collected before the peak of the precipitation for this event occurred. However, 1.55 inches of rain had fallen by the time the samples were collected. It appears from the turbidity data collected for these rain events that the intensity of a rain event has far more effect on the turbidity levels than does the actual duration of the event. The data for Total Suspended Solids are consistent with the results for turbidity (Table 3).

To make station to station comparisons of the turbidity levels throughout the site, an average was calculated for each station for the three events sampled. Average turbidity levels are presented in Table 2 and Figure 6. Station SW-C-01, the upper Woodland Branch station that had the highest overall turbidity reading also had the highest average turbidity level of 25 NTU among the nine stations sampled. The three stations on Woodland Branch had the highest average turbidity levels, followed by the John's Creek stations and the lowest average turbidity values were collected at SW-D-01 (5 NTU) located on the un-named stream which discharges directly to the Chesapeake Bay near the barge dock area. While average turbidity values at the John's Creek stations were lower than the Woodland Branch stations in general, SW-J-01, located at the upper reach of Goldstein Branch had an average turbidity value of 19 NTU which was similar to those at Woodland Branch.

In addition to Turbidity, water samples collected at the site were also analyzed by the laboratory for the following constituents: Total Suspended solids, Biological Oxygen Demand, pH, Nitrate/Nitrite, Total Nitrogen, Total Kjeldahl Nitrogen, Total Phosphorus, and Oil and Grease. The results of these analyses are located in Table 3. Since the objective of this sampling program was to establish baseline information of the above listed analytes, little conclusions can be drawn on these values. However, these values were compared to values collected during a dry weather sampling event in 2006. Although the 2006 results were from a Spring sampling event, the comparison of data from this known dry sample event to data collected in this study shows some differences in data from wet and dry weather events.

Laboratory reports and Chain-of-Custody's for the three sampling events are located in Appendix A.

3.3 Flow Measurement Results

Depth and velocity measurements taken in the field at the site using a Marsh-McBirney Flowmeter were used to observe differences in water discharge during the three sampling events. These data were used to supplement flow data collected by the Stingray Flowmeters that were deployed in John's Creek and Woodland Branch. Since the meter deployed at John's Creek provided the best long term level and velocity data at the site throughout the study period, these data were used to examine the effects of the three rain events on the flow in the streams. Figures 7, 8, and 9 compare precipitation data collected by the rain gauge and plot it against level or water elevation data collected by the flowmeter for each sampling event. Figure 7 shows that the first event was a quick rain event and the response of the stream at the John's Creek meter was that the stream flow increased quickly as well. Figure 8 shows that the September 28 event was a larger rain event and thus the stream response was also larger, going up in elevation nearly 1-foot. The response of the stream after the event is similar to that of the September 11 event. The October 16 rain event was a much different event than the two sampled in September. Data from the event displayed in Figure 9 show that the majority of the rain fell on October 15 and then a spike of rain early on the 16th. During the time between the two spikes of rain and until October 20th, a steady rain fell the entire time. The lower intensity of the initial rain fall and the light steady rain following didn't cause the stream level to peak until three days later on October 18th. The stream peaked at slightly over 1-foot in elevation, which was very similar to the intensity of the peak on September 28, but a much different response of flow and duration is evident between the two events.

Total flow was calculated for each sampling location using the depth and velocity measurements taken at each sample site during the study (Table 4). Flow was calculated as cubic feet/second (cfs) using depth and velocity readings measured in the field. Readings were taken at three to five points across the channel. Using the depth, velocity and wetted width of the channel, an area and the resulting flow was calculated for each sub segment of the channel cross section. Each segment flow calculation was then summed to calculate total flow in cubic feet/second at each site for each event. These calculations represent total discharge for each site for each storm event.

Total flow at each site coincides with the resulting velocity measurements and the intensity and relativity of the sampling event to the rain event peak. Highest discharges for the study occurred at the downstream John's Creek site (Station G). This is expected as this is the largest stream segment and the largest drainage area on the site. Discharge calculations at Woodland Branch (Station A) were limited due to the meter malfunction at this location. However, upstream Woodland Branch (Station B) exhibited higher flows than most of the other sampling locations.

4. CONCLUSIONS

The objective of this study was to establish baseline data and existing conditions of selected streams at the Calvert Cliffs Nuclear Power Plant during storm events. Precipitation data were collected to verify the intensity and duration of rain events throughout the study period from August to October 2009. During this time, a total of five rain events occurred that measured over 1-inch of precipitation. Three of these five rain events were sampled.

Water samples were collected at nine stations to document chemical and physical properties of the water during periods of stormwater runoff. Of primary interest were turbidity levels during these sampling events. Turbidity levels increased at all nine sampling stations during runoff events, however, intensity of the turbidity varied by the intensity of the event and when during the event the samples were collected. The maximum turbidity level at any station during the study was 41 NTU. Nine additional physical and chemical water quality values were analyzed for each station and each event via laboratory analysis. These data were compared to previous dry weather sampling at the site to show the difference in results and to put these wet weather sampling events into some type of site specific context. No values were flagged as extremely high or out of the ordinary for stormwater runoff for these events. In addition, flow data were collected via manual flow measurements and by stream mounted flow monitoring equipment. Flow data were used to document the increase in flows and the duration of these increases when compared to the intensity and duration of a rain event. Much like turbidity measurements, flow measurements increased during and soon after rain events occurred. The extent and duration of these increased flows was dependent upon the intensity and duration of the rain event. Additional flow monitoring in the Woodland Branch watershed would be helpful in better understanding the response of this system to stormwater runoff. The Woodland Branch watershed appears to respond somewhat differently to stormwater runoff events than does the John's Creek watershed. Further study of the site would better define this difference.

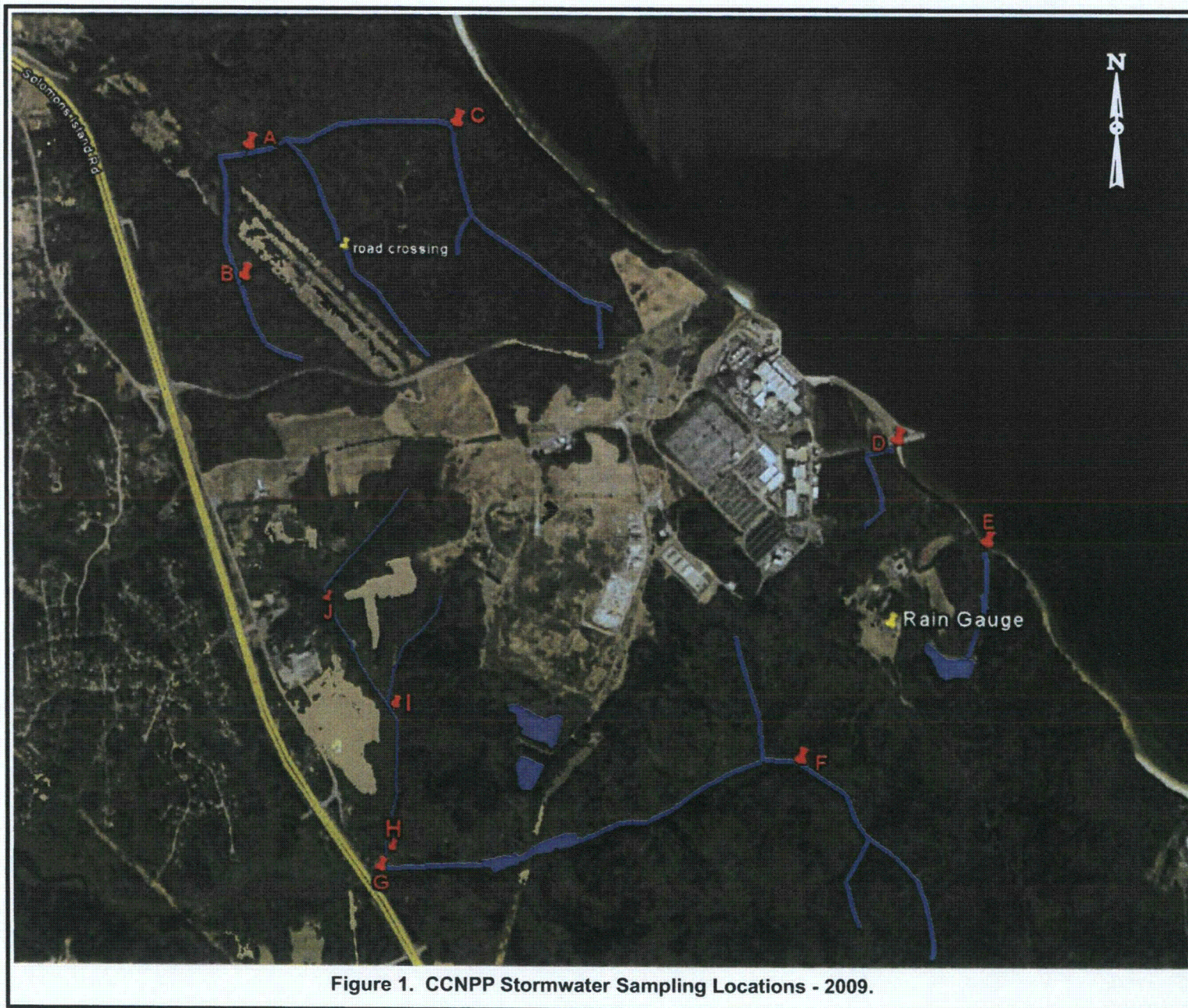


Figure 1. CCNPP Stormwater Sampling Locations - 2009.

Figure 2. Daily Total Rainfall at Calvert Cliffs Site, August-November 2009

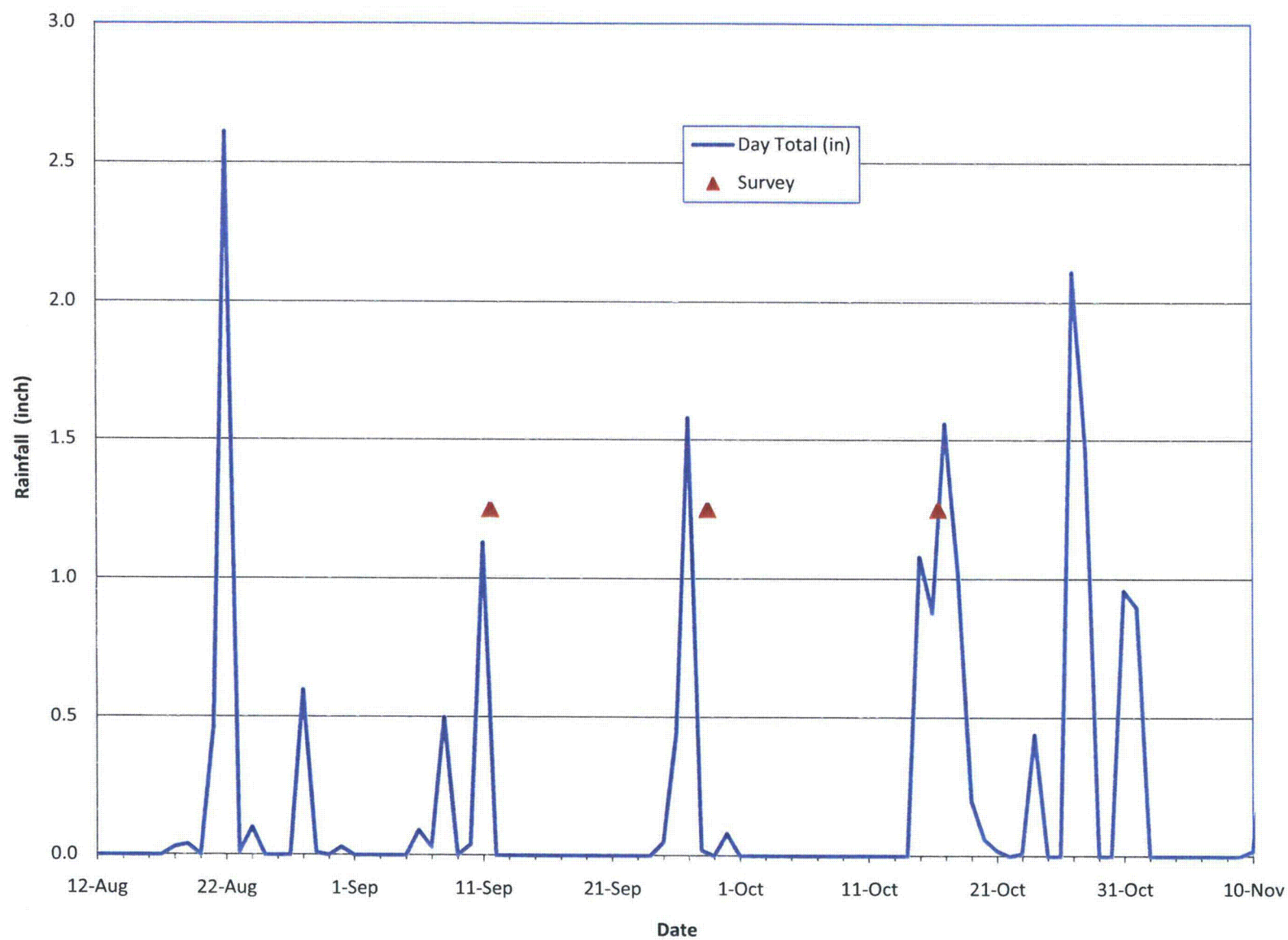


Figure 3. Turbidity of Calvert Cliffs Surface Water Sampling Stations on 9/11/2009

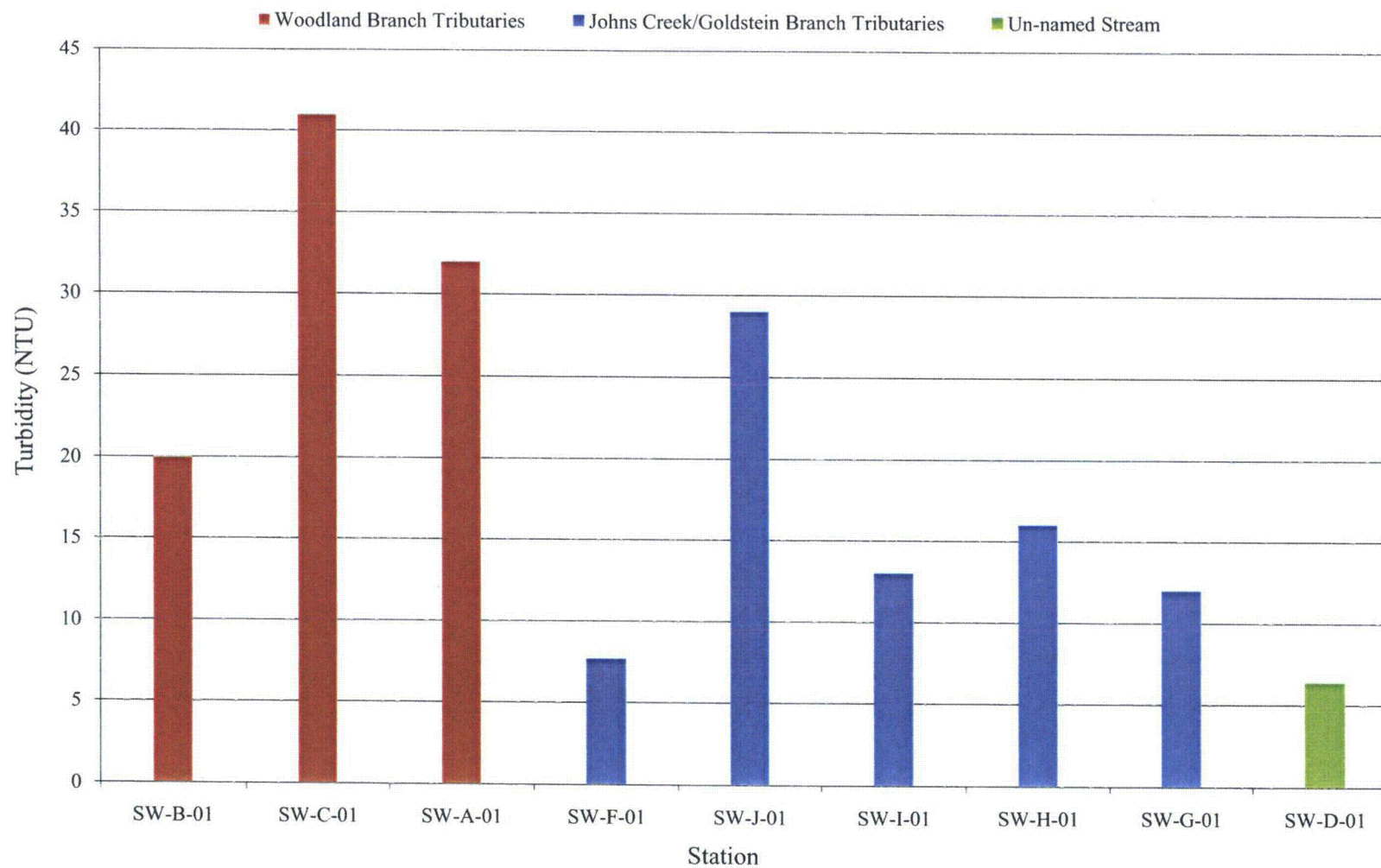


Figure 4. Turbidity of Calvert Cliffs Surface Water Sampling Stations on 9/28/2009

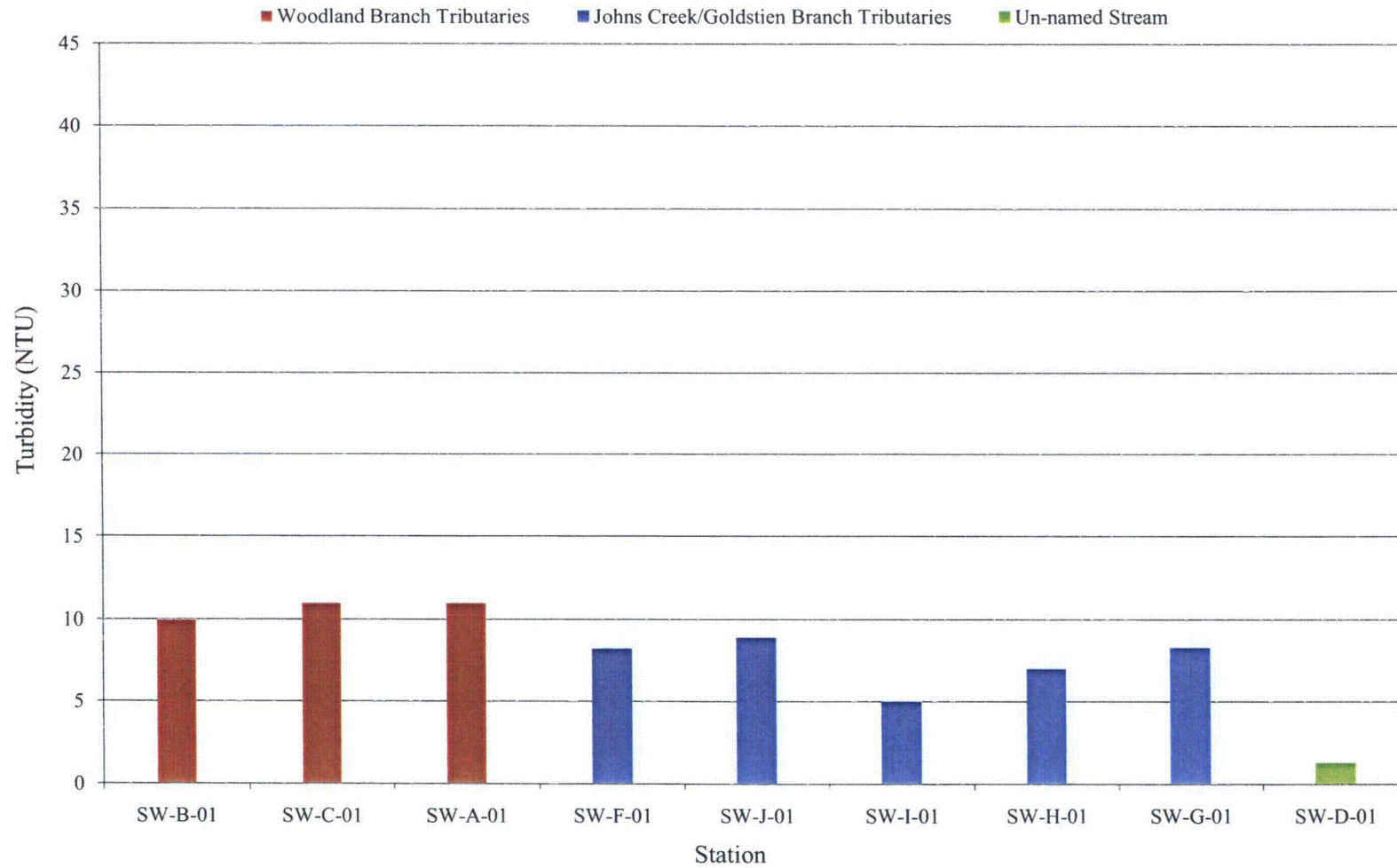


Figure 5. Turbidity of Calvert Cliffs Surface Water Sampling Stations on 10/16/2009

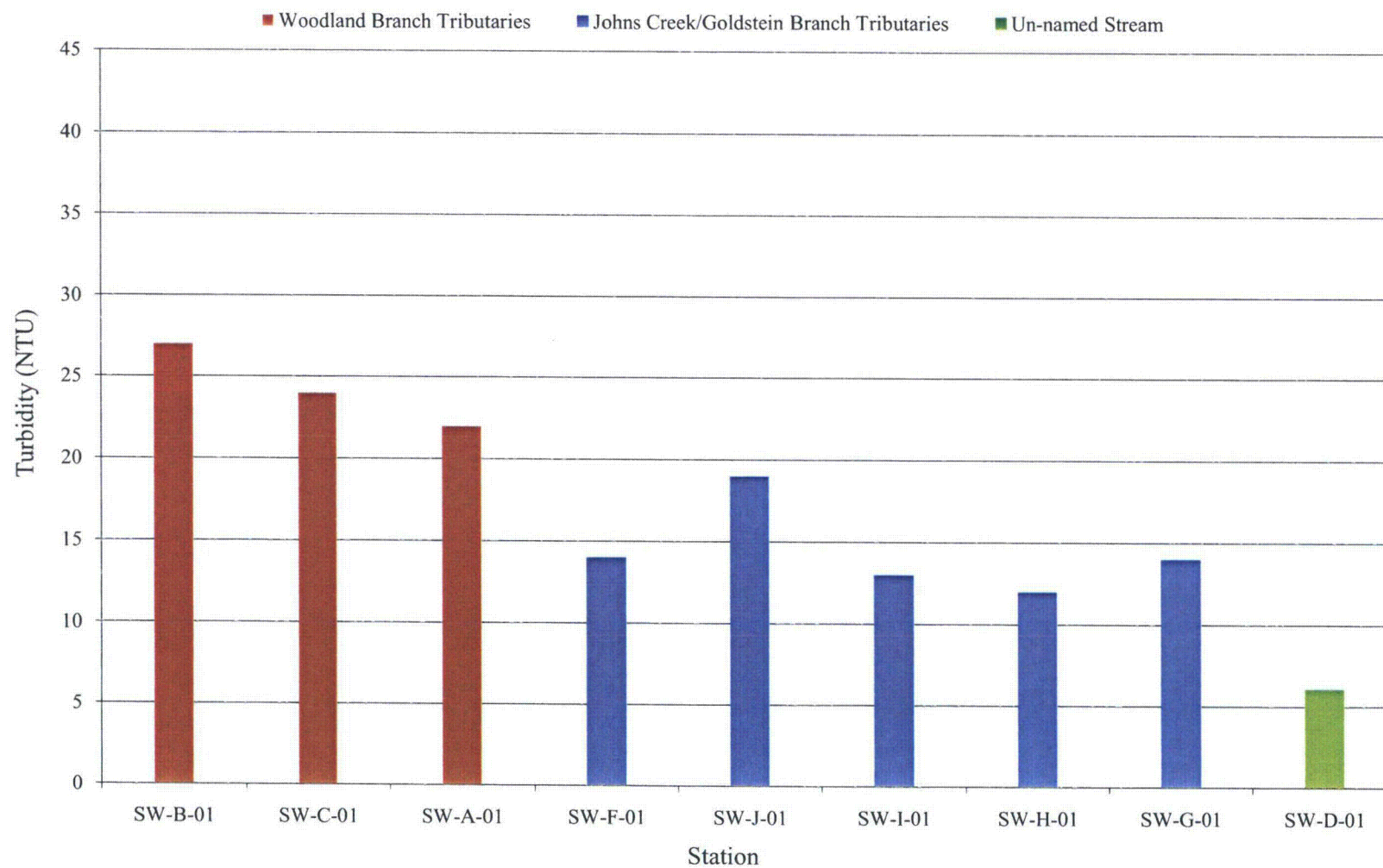


Figure 6. Average Turbidity of Calvert Cliffs Surface Water Sampling Stations

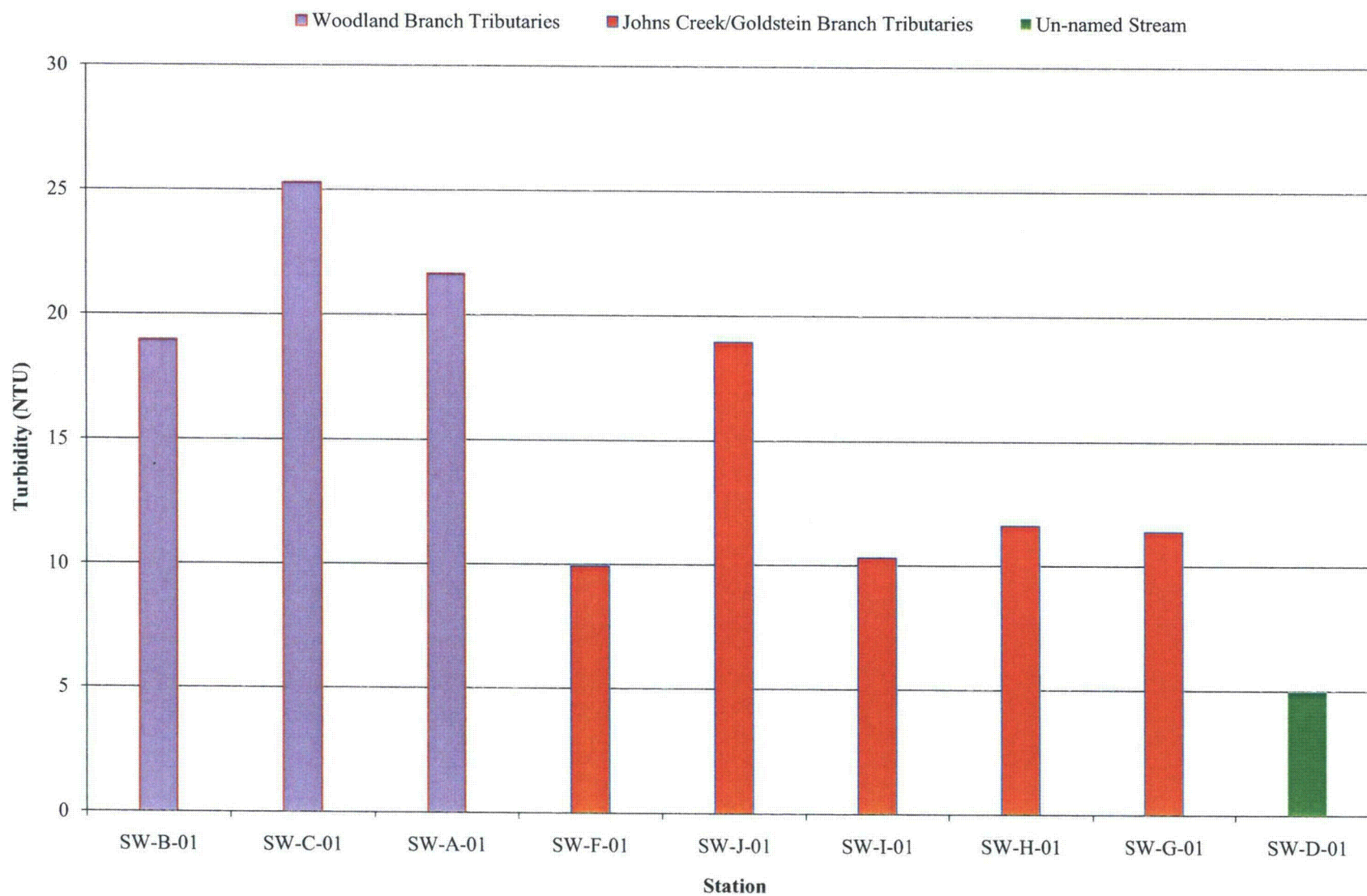


Figure 7. Calvert Cliffs 15-Minute Rain Data and Water Surface Elevation on Johns Creek, 11 September 2009 Event

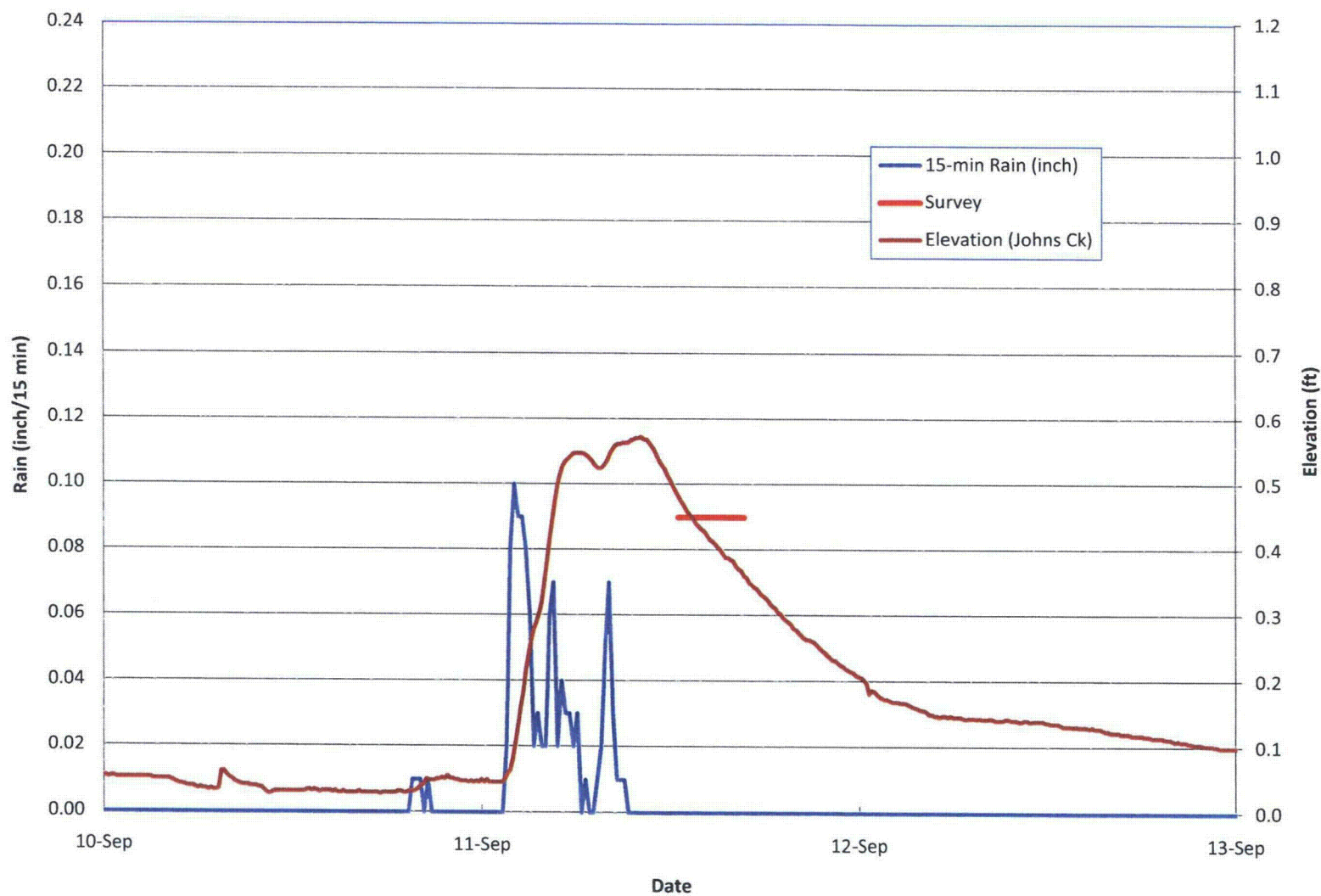


Figure 8. Calvert Cliffs 15-Minute Rain Data and Water Surface Elevation on Johns Creek, 28 September 2009 Event

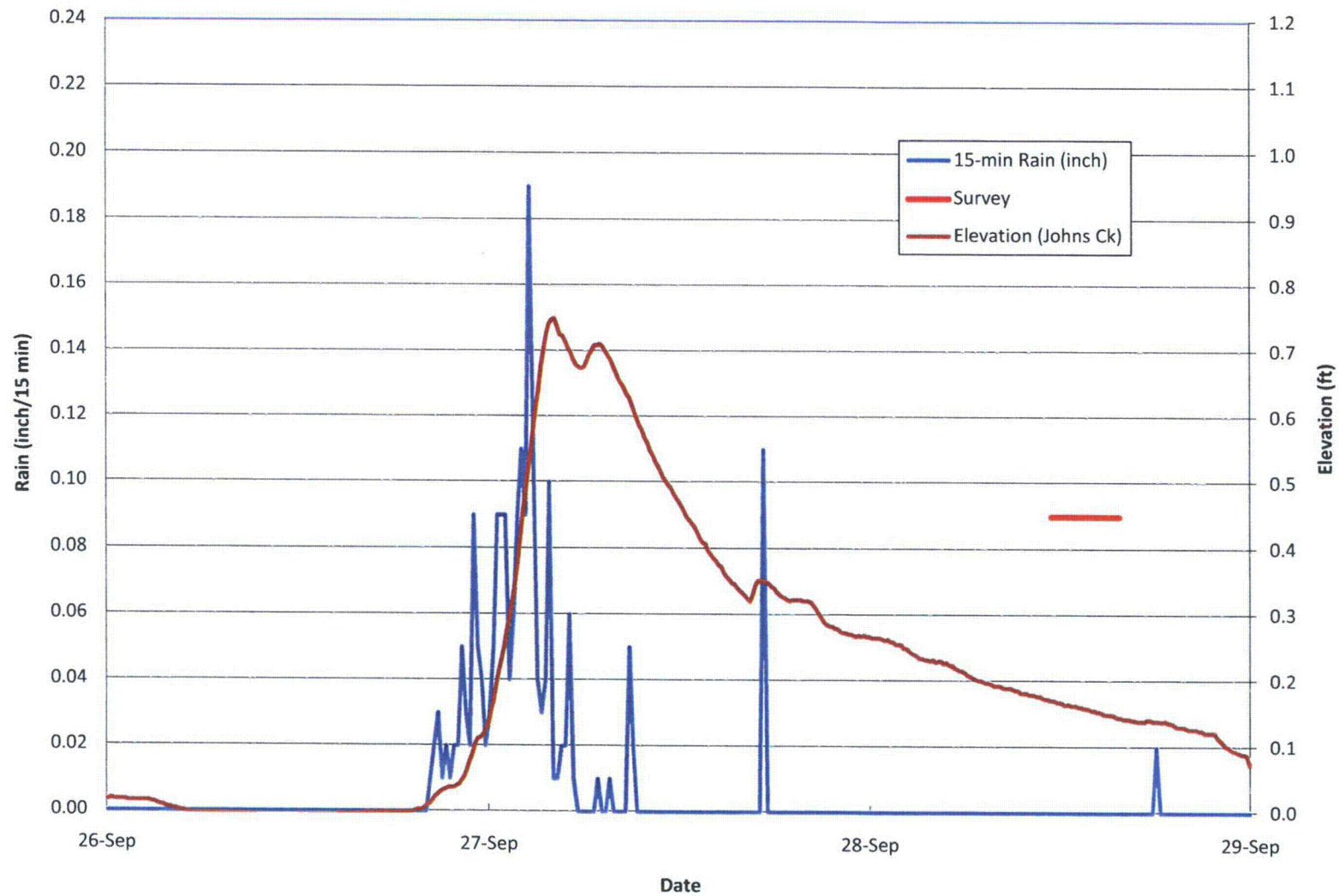


Figure 9. Calvert Cliffs 15-Minute Rain Data and Water Surface Elevation on Johns Creek, 16 October 2009 Event

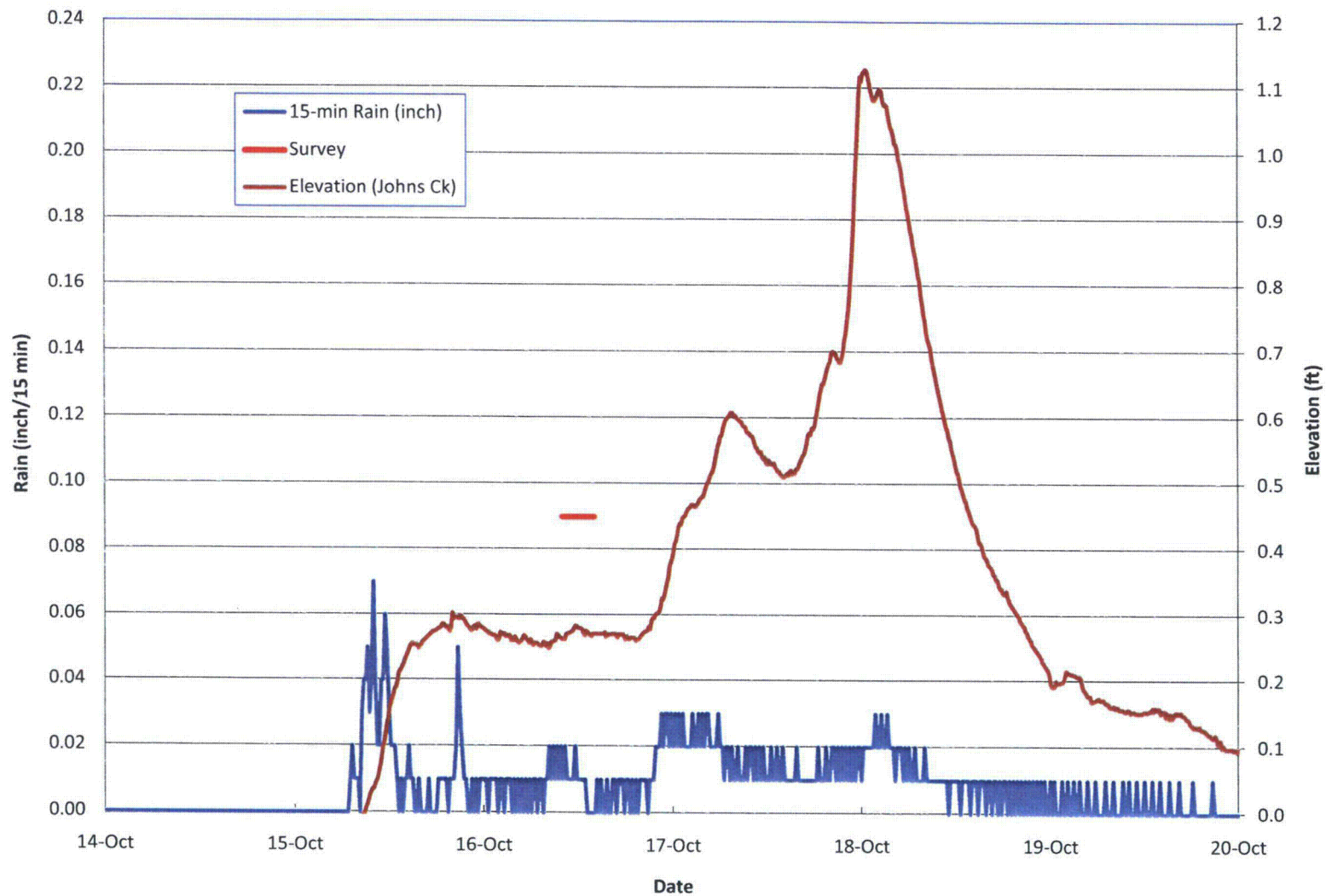


Table 1. GPS Coordinates for Stormwater Sampling Locations - 2009

Station	Latitude	Longitude
SW-A-01	38°26' 31.60"	76°27' 47.59"
SW-B-01	38°26' 17.31"	76°27' 49.29"
SW-C-01	38°26' 35.74"	76°27' 18.25"
SW-D-01	38°25' 56.84"	76°26' 14.93"
SW-E-01	38°25' 45.37"	76°25' 58.42"
SW-F-01	38°25' 19.73"	76°26' 26.01"
SW-G-01	38°25' 06.96"	76°27' 27.47"
SW-H-01	38°25' 12.59"	76°27' 27.75"
SW-I-01	38°25' 26.94"	76°27' 27.07"
SW-J-01	38°25' 39.07"	76°27' 35.44"
Rain Gauge	38°25' 36.73"	76°26' 12.49"

Table 2. Turbidity (NTU) Results For Three Stormwater Sampling Events At CCNPP - 2009

Sample Date	Sampling Stations									
	Woodland Branch Tributaries			Johns Creek/Goldstein Branch Tributaries					Un-named Streams	
	SW-B-01	SW-C-01	SW-A-01	SW-F-01	SW-J-01	SW-I-01	SW-H-01	SW-G-01	SW-D-01	SW-E-01
9/11/2009 NTU	20	41	32	7.7	29	13	16	12	6.4	NA
Flow(cfs) ¹	2.08	0.2	NA	0.55	0.41	0.23	0.63	2.26	1.54	0
9/28/2009 NTU	10	11	11	8.2	8.9	5	7	8.3	1.3	NA
Flow (cfs)	NA	NA	NA	0.17	NA	NA	NA	0.42	0.21	0
10/16/2009 NTU	27	24	22	14	19	13	12	14	6.1	NA
Flow (cfs)	1.56	0.5	1.02	2.85	0.29	2.2	0.78	10.97	3.46	0
Average Turbidity	12	15	17	6	12	7	7	8	3	NA

NA Data are not available

¹ Table 4 shows the calculation of total flow

Table 3. Laboratory Analysis Of Three Stormwater Sampling Events At CCNPP - 2009

Sample Date: 9/11/2009 Station	2006 Sampling Data For a Dry Event**	Woodland Branch Tributaries			Johns Creek/Goldstein Branch Tributaries					Un-named Stream	
		SW-B-01	SW-C-01	SW-A-01	SW-F-01	SW-J-01	SW-I-01	SW-H-01	SW-G-01	SW-D-01	SW-E-01*
Turbidity (NTU)	9.9	20	41	32	7.7	29	13	16	12	6.4	*
Total Suspended Solids (mg/L)	<5	41	49	43	12	41	10	15	6.8	22	*
BOD (mg/L)	<3.0	6.8	8.3	7.3	15	6.9	7.8	7.8	6.8	7.3	*
pH (pH units)	7.5	6.8	6.6	6.6	5.8	7.2	6.9	6.8	6.6	6.7	*
Nitrate/Nitrite as N (mg/L)	0.15	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.12	*
Nitrogen, Total as N (mg/L)	NT	0.82	0.78	1.3	0.35	0.57	0.38	0.43	0.78	0.72	*
Total Kjeldahl Nitrogen (mg/L)	<1.0	0.82	0.78	1.3	0.35	0.57	0.38	0.43	0.78	0.59	*
Phosphorus, Total as P (mg/L)	0.034	0.037	0.068	0.073	0.016	0.03	0.038	0.041	0.035	0.065	*
Oil and Grease (mg/L)	NT	5 U	5 U	5 U	5 U	2.6 J	5 U	5 U	5 U	4.3 J	*

Sample Date: 9/28/2009	2006 Sampling Data For a Dry Event**	Woodland Branch Tributaries			Johns Creek/Goldstein Branch Tributaries					Un-named Stream	
		SW-B-01	SW-C-01	SW-A-01	SW-F-01	SW-J-01	SW-I-01	SW-H-01	SW-G-01	SW-D-01	SW-E-01*
Turbidity (NTU)	9.9	10	11	11	8.2	8.9	5	7	8.3	1.3	*
Total Suspended Solids (mg/L)	<5	12	16	9.6	10 U	12	4.8	2.8	10 U	2.4	*
BOD (mg/L)	<3.0	3.9	3 U	3 U	5.2	3.6	3.8	6.3	5.7	4.6	*
pH (pH units)	7.5	6.3	6.6	6.4	7.4	7.4	7.5	7.4	6.8	7.8	*
Nitrate/Nitrite as N (mg/L)	0.15	0.05 U	0.1 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	*
Nitrogen, Total as N (mg/L)	NT	0.49	0.41	0.26	0.34	0.38	0.25	0.27	0.3	0.22	*
Total Kjeldahl Nitrogen (mg/L)	<1.0	0.49	0.41	0.26	0.34	0.38	0.25	0.27	0.3	0.22	*
Phosphorus, Total as P (mg/L)	0.034	0.02	0.019	0.029	0.025	0.019	0.037	0.038	0.031	0.051	*
Oil and Grease (mg/L)	NT	3.2 J	3.3 J	5 U	5 U	5 U	3.7 J	5 U	2.7 J	3.4 J	*

Sample Date: 10/16/2009	2006 Sampling Data For a Dry Event**	Woodland Branch Tributaries			Johns Creek/Goldstein Branch Tributaries					Un-named Stream	
		SW-B-01	SW-C-01	SW-A-01	SW-F-01	SW-J-01	SW-I-01	SW-H-01	SW-G-01	SW-D-01	SW-E-01*
Turbidity (NTU)	9.9	27	24	22	14	19	13	12	14	6.1	*
Total Suspended Solids (mg/L)	<5	33	18	16	15	19	10 U	10 U	6.4	6	*
BOD (mg/L)	<3.0	4.2	4	4.3	4.9	4.7	4.9	5.1	7.8	4.7	*
pH (pH units)	7.5	6.5	6.6	6.6	6.3	7.3	7.2	6.9	6.8	7.1	*
Nitrate/Nitrite as N (mg/L)	0.15	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.2	*
Nitrogen, Total as N (mg/L)	NT	0.49	0.62	0.47	0.43	0.34	0.32	0.39	0.36	0.57	*
Total Kjeldahl Nitrogen (mg/L)	<1.0	0.49	0.62	0.47	0.43	0.34	0.32	0.39	0.36	0.36	*
Phosphorus, Total as P (mg/L)	0.034	0.033	0.059	0.055	0.026	0.022	0.045	0.092	0.034	0.055	*
Oil and Grease (mg/L)	NT	5 U	3.8 J	5 U	5 U	3.3 J	5 U	5 U	2.5 J	5 U	*

* Note: SW-E-01 not sampled. Dry stream channel.

** EA sampling data for a dry weather event during 2006 at CCNPP.

U = Indicates that the compound was analyzed, but not detected.

J = Analyte concentration is greater than the MDL but less than reporting limit.

NT = Not Tested

Table 4. Flow (cfs) Calculations for Three Stormwater Sampling Events at CCNPP - 2009

John's Creek Sites

Location - F

Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09				
0.88	0.15	0.50	0.131	0.07	
0.88	0.20	1.00	0.175	0.18	
0.88	0.30	0.90	0.263	0.24	
0.88	0.20	0.40	0.175	0.07	0.55
Event 2	28-Sep-09				
1.20	0.20	0.10	0.240	0.02	
1.20	0.30	0.20	0.360	0.07	
1.20	0.30	0.20	0.360	0.07	0.17
Event 3	16-Oct-09				
1.72	0.46	1.34	0.789	1.06	
1.72	0.54	1.50	0.934	1.40	
1.72	0.25	0.90	0.431	0.39	2.85

Location - G

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09				
1.06	0.34	0.30	0.363	0.11	
1.06	0.43	0.35	0.452	0.16	
1.06	0.91	0.58	0.959	0.55	
1.06	1.06	0.64	1.127	0.72	
1.06	0.49	0.38	0.517	0.20	
1.06	0.38	0.33	0.407	0.13	
1.06	0.36	0.31	0.385	0.12	
1.06	0.57	0.42	0.605	0.26	2.26
Event 2	28-Sep-09				
1.06	0.10	0.05	0.110	0.01	
1.06	0.19	0.08	0.199	0.02	
1.06	0.67	0.18	0.707	0.13	
1.06	0.83	0.21	0.875	0.19	
1.06	0.25	0.10	0.265	0.03	
1.06	0.15	0.07	0.155	0.01	
1.06	0.13	0.06	0.133	0.01	
1.06	0.33	0.12	0.353	0.04	0.42
Event 3	16-Oct-09				
2.75	0.67	3.00	1.834	5.50	
2.75	0.58	2.74	1.603	4.40	
2.75	0.25	1.56	0.688	1.07	10.97

**Table 4. Flow (cfs) Calculations for Three Stormwater Sampling Events at CCNPP - 2009
(continued)**

Goldstein Branch Sites

Location - H

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09				
0.82	0.10	0.20	0.082	0.02	0.63
0.82	0.25	0.60	0.205	0.12	
0.82	0.40	0.80	0.328	0.26	
0.82	0.30	0.80	0.246	0.20	
0.82	0.20	0.20	0.164	0.03	
Event 2	28-Sep-09				
0.86	0.20	Not Measured			
0.86	0.25				
0.86	0.33				
0.86	0.33				
0.86	0.10				
Event 3	16-Oct-09				
1.53	0.21	0.25	0.318	0.08	0.78
1.53	0.42	0.40	0.637	0.26	
1.53	0.58	0.50	0.890	0.45	

Location - I

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09				
0.67	0.10	0.30	0.067	0.02	0.23
0.67	0.15	0.40	0.100	0.04	
0.67	0.15	0.60	0.100	0.06	
0.67	0.20	0.50	0.133	0.07	
0.67	0.20	0.30	0.133	0.04	
0.67	0.10	0.10	0.067	0.01	
Event 2	28-Sep-09				
0.96	0.08	Not Measured			
0.96	0.19				
0.96	0.13				
0.96	0.08				
Event 3	16-Oct-09				
1.58	0.42	0.84	0.660	0.55	2.20
1.58	0.42	0.84	0.660	0.55	
1.58	0.63	1.10	0.990	1.09	

**Table 4. Flow (cfs) Calculations for Three Stormwater Sampling Events at CCNPP - 2009
(continued)**

Location - J

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09				
0.75	0.20	1.50	0.150	0.23	
0.75	0.10	1.20	0.075	0.09	
0.75	0.15	0.85	0.113	0.10	0.41
Event 2	28-Sep-09				
0.75	0.13	Not Measured			
0.75	0.17				
0.75	0.10				
Event 3	16-Oct-09				
0.72	0.14	0.82	0.103	0.08	
0.72	0.19	1.00	0.138	0.14	
0.72	0.13	0.75	0.090	0.07	0.29

**Table 4. Flow (cfs) Calculations for Three Stormwater Sampling Events at CCNPP - 2009
(continued)**

Woodland Branch Sites

Location - A

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09	Not Measured			
Event 2	28-Sep-09	Not Measured			
1.25	0.48				
1.25	0.52				
1.25	0.52				
1.25	0.29				
Event 3	16-Oct-09				
1.72	1.00	0.18	1.723	0.31	1.02
1.72	1.17	0.20	2.011	0.40	
1.72	1.00	0.18	1.723	0.31	

Location - B

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09	0.50 0.60 0.50	1.125 1.125 1.688	0.56 0.68 0.84	2.08
1.13	1.00				
1.13	1.00				
1.13	1.50				
Event 2	28-Sep-09	Not Measured			
	0.10				
	0.33				
	0.38				
	0.12				
Event 3	16-Oct-09	1.16 1.40 1.24	0.354 0.472 0.393	0.41 0.66 0.49	1.56
0.94	0.38				
0.94	0.50				
0.94	0.42				

Table 4. Flow (cfs) Calculations for Three Stormwater Sampling Events at CCNPP - 2009
(continued)

Location - C

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09				
1.47	0.10	0.40	0.147	0.06	
1.47	0.20	0.30	0.293	0.09	
1.47	0.15	0.25	0.220	0.06	0.20
Event 2	28-Sep-09				
	0.13	Not Measured			
	0.23				
	0.25				
	0.10				
Event 3	16-Oct-09				
1.47	0.17	0.46	0.246	0.11	
1.47	0.25	0.60	0.368	0.22	
1.47	0.21	0.53	0.306	0.16	0.50

**Table 4. Flow (cfs) Calculations for Three Stormwater Sampling Events at CCNPP - 2009
(continued)**

Un-named Tributaries

Location - D

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09				
1.22	0.20	0.50	0.243	0.12	
1.22	0.30	1.10	0.365	0.40	
1.22	0.40	1.10	0.486	0.54	
1.22	0.50	0.50	0.608	0.30	
1.22	0.50	0.30	0.608	0.18	1.54
Event 2	28-Sep-09				
0.88	0.05	0.05	0.044	0.00	
0.88	0.10	0.10	0.088	0.01	
0.88	0.25	0.20	0.220	0.04	
0.88	0.30	0.40	0.264	0.11	
0.88	0.30	0.20	0.264	0.05	0.21
Event 3	16-Oct-09				
2.00	0.25	1.51	0.500	0.76	
2.00	0.33	1.83	0.666	1.22	
2.00	0.38	1.98	0.750	1.49	3.46

Location - E

Segment Width (ft)	Segment Depth (ft)	Velocity (ft/sec)	Area (ft ²)	Flow (cfs)	Total Flow (cfs)
Event 1	11-Sep-09 Dry				
Event 2	28-Sep-09 Dry				
Event 3	16-Oct-09 Dry				

APPENDIX A

Laboratory Reports



Microbac Laboratories, Inc.
Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
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COVER LETTER

Rob Ballantine
EA Engineering
15 Loveton Circle
Sparks, MD 21152
RE: Calvert Cliffs Stormwater

October 30, 2009
Report No.: 09I0492

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 09/11/2009 19:55.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Notes and Definitions
- Cooler Receipt Log
- Chain of Custody

10/30/2009

Final report reviewed by:

Melanie C. Duszynski For Lisa M. Grant/Project Manager

Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact the Director or Trevor Boyce, President at tboyce@microbac.com or Robert Morgan, Chief Operation Officer, at rmorgan@microbac.com.



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Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 09I0492
Reported: 10/30/2009 13:17

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
SW-A-01	09I0492-01	Surface Water	Not Specified	09/11/2009 13:20	09/11/2009 19:55
SW-B-01	09I0492-02	Surface Water	Not Specified	09/11/2009 12:55	09/11/2009 19:55
SW-C-01	09I0492-03	Surface Water	Not Specified	09/11/2009 13:40	09/11/2009 19:55
SW-D-01	09I0492-04	Surface Water	Not Specified	09/11/2009 14:05	09/11/2009 19:55
SW-F-01	09I0492-05	Surface Water	Not Specified	09/11/2009 14:50	09/11/2009 19:55
SW-G-01	09I0492-06	Surface Water	Not Specified	09/11/2009 15:30	09/11/2009 19:55
SW-H-01	09I0492-07	Surface Water	Not Specified	09/11/2009 15:55	09/11/2009 19:55
SW-I-01	09I0492-08	Surface Water	Not Specified	09/11/2009 16:40	09/11/2009 19:55
SW-J-01	09I0492-09	Surface Water	Not Specified	09/11/2009 12:30	09/11/2009 19:55
SW-H-QC-01	09I0492-10	Surface Water	Not Specified	09/11/2009 15:55	09/11/2009 19:55

Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Baltimore Division

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CERTIFICATE OF ANALYSISEA Engineering
15 Loveton Circle
Sparks, MD 21152Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob BallantineReport: 0910492
Reported: 10/30/2009 13:17**SW-A-01****0910492-01 (Surface Water) Sampled: 09/11/2009 13:20; Type: Not Specified**

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division**Wet Chemistry**

BOD	7.3	5.0	mg/L	091309 1116	091809 0943	LCR	SM (20) 5210B	
Nitrogen, Total as N	1.34	0.10	mg/L	091509 0900	091709 1019	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	091409 1304	091409 1304	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.073	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	6.6	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	1.34	0.10	mg/L	091509 0900	091709 1019	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	43	4.0	mg/L	091509 1400	091509 1405	LCR	SM (20) 2540D	
Turbidity	32	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	ND	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division



Melanie C. Duszynski For Lisa M. Grant, Project Manager

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 0910492
Reported: 10/30/2009 13:17

SW-B-01

0910492-02 (Surface Water) Sampled: 09/11/2009 12:55; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	6.8	5.0	mg/L	091309 1114	091809 0940	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.82	0.10	mg/L	091509 0900	091709 1019	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	091409 1304	091409 1304	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.037	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	6.8	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.82	0.10	mg/L	091509 0900	091709 1019	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	41	4.0	mg/L	091509 1400	091509 1406	LCR	SM (20) 2540D	
Turbidity	20	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	ND	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 09I0492
Reported: 10/30/2009 13:17

SW-C-01

09I0492-03 (Surface Water) Sampled: 09/11/2009 13:40; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	8.3	5.0	mg/L	091309 1120	091809 0947	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.78	0.10	mg/L	091509 0900	091709 1019	VAS	Calculation	
Nitrate/Nitrite as N	0.05	0.05	mg/L	091409 1304	091409 1304	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.068	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	6.6	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.78	0.10	mg/L	091509 0900	091709 1019	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	49	4.0	mg/L	091509 1400	091509 1406	LCR	SM (20) 2540D	
Turbidity	41	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	ND	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	
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Melanie C Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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CERTIFICATE OF ANALYSIS

EA Engineering 15 Loveton Circle Sparks, MD 21152	Project: Calvert Cliffs Stormwater Project Number: Calvert Cliffs Stormwater Project Manager: Rob Ballantine	Report: 0910492 Reported: 10/30/2009 13:17
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SW-D-01

0910492-04 (Surface Water) Sampled: 09/11/2009 14:05; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	7.3	5.0	mg/L	091309 1122	091809 0950	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.72	0.10	mg/L	091509 0900	091709 1019	VAS	Calculation	
Nitrate/Nitrite as N	0.12	0.05	mg/L	091409 1304	091409 1304	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.065	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	6.7	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.59	0.10	mg/L	091509 0900	091709 1019	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	22	4.0	mg/L	091509 1400	091509 1406	LCR	SM (20) 2540D	
Turbidity	6.4	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	4.3	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Phone: 410-633-1800

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 0910492
Reported: 10/30/2009 13:17

SW-F-01

0910492-05 (Surface Water) Sampled: 09/11/2009 14:50; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	15	5.0	mg/L	091309 1124	091809 0957	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.35	0.10	mg/L	091509 0900	091709 1019	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	091409 1304	091409 1304	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.016	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	5.8	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.35	0.10	mg/L	091509 0900	091709 1019	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	12	4.0	mg/L	091509 1400	091509 1406	LCR	SM (20) 2540D	
Turbidity	7.7	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	ND	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	
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Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 09I0492
Reported: 10/30/2009 13:17

SW-G-01

09I0492-06 (Surface Water) Sampled: 09/11/2009 15:30; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	6.8	5.0	mg/L	091309 1126	091809 1000	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.78	0.10	mg/L	091809 1100	092209 1031	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	091509 0728	091509 0728	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.035	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	6.6	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.78	0.10	mg/L	091809 1100	092209 1031	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	6.8	4.0	mg/L	091509 1400	091509 1407	LCR	SM (20) 2540D	
Turbidity	12	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	ND	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering 15 Loveton Circle Sparks, MD 21152	Project: Calvert Cliffs Stormwater Project Number: Calvert Cliffs Stormwater Project Manager: Rob Ballantine	Report: 0910492 Reported: 10/30/2009 13:17
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SW-H-01

0910492-07 (Surface Water) Sampled: 09/11/2009 15:55; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	7.8	5.0	mg/L	091309 1129	091809 1006	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.43	0.10	mg/L	091809 1100	092209 1031	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	091509 0728	091509 0728	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.041	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	6.8	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.43	0.10	mg/L	091809 1100	092209 1031	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	15	4.0	mg/L	091509 1400	091509 1407	LCR	SM (20) 2540D	
Turbidity	16	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	ND	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Microbac Laboratories, Inc.

Baltimore Division

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Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 0910492
Reported: 10/30/2009 13:17

SW-I-01

0910492-08 (Surface Water) Sampled: 09/11/2009 16:40; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	7.8	5.0	mg/L	091309 1133	091809 1010	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.38	0.10	mg/L	091809 1100	092209 1031	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	091509 0728	091509 0728	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.038	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	6.9	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.38	0.10	mg/L	091809 1100	092209 1031	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	10	4.0	mg/L	091509 1400	091509 1407	LCR	SM (20) 2540D	
Turbidity	13	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	ND	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 0910492
Reported: 10/30/2009 13:17

SW-J-01

0910492-09 (Surface Water) Sampled: 09/11/2009 12:30; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	6.9	5.0	mg/L	091309 1110	091809 0930	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.57	0.10	mg/L	091809 1100	092209 1031	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	091509 0728	091509 0728	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.030	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	7.2	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.57	0.10	mg/L	091809 1100	092209 1031	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	41	4.0	mg/L	091509 1400	091509 1407	LCR	SM (20) 2540D	
Turbidity	29	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	2.6	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 0910492
Reported: 10/30/2009 13:17

SW-H-QC-01

0910492-10 (Surface Water) Sampled: 09/11/2009 15:55; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

Nitrogen, Total as N	0.46	0.10	mg/L	091809 1100	092209 1031	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	091509 0728	091509 0728	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.049	0.010	mg/L	091409 1430	091509 0943	VAS	EPA 365.1	
pH	6.8	0.10	pH Units	091409 1200	091409 1241	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.46	0.10	mg/L	091809 1100	092209 1031	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	14	2.0	mg/L	091509 1400	091509 1408	LCR	SM (20) 2540D	
Turbidity	17	0.10	NTU	091409 0930	091409 0930	VAS	EPA 180.1	H1

Oil and Grease

Oil & Grease	ND	5.0	mg/L	092209 0930	092309 1251	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Rob Ballantine

Report: 0910492
Reported: 10/30/2009 13:17

Notes and Definitions

- J Analyte concentration is greater than the MDL but less than the reporting limit.
- H6 Sample received past holding time; analysis best performed at time of collection.
- H1 Sample analyzed past maximum recommended holding time.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

Certifications

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

- A2LA (Microbiology): 410.02
- A2LA (Environmental): 410.01
- A2LA (ELLAP): 410.01
- CPSC: 1115
- Maryland: 109
- Pennsylvania (NELAC): 68-00339
- USDA: S-53726
- Virginia: 00152

Cooler Receipt Log

Cooler ID: Default Cooler

Cooler Temp: °C

Custody Seals Intact: Yes

COC/Containers Agree: Yes

Containers Intact: Yes

Correct Preservation: Yes

Received On Ice: Yes

Correct Number of Containers Received: Yes

Radiation Scan Acceptable: Yes

Sufficient Sample Volume for Testing: Yes

COC Present: Yes

Samples Received in Proper Condition: Yes

Comments:

09I0492

Client: EA Engineering Science, and Technology, Inc.																											
Project Manager: Christine Papageorgis																											
Phone: 410-239-6686																											
Field Contact:																											
Rob Ballantine																											
Phone: 410-627-2731																											
Project Name: Calvert Cliffs Stormwater																											
Project#: 1462104.00																											
				Parameters/Method Numbers for Analysis										Chain of Custody Record													
				No. of Containers	Turbidity, TSS, pH, BOD, Total N	Total P, Phos	Oil and Grease									Laboratory:											
Date	Time	Water	Sediment	Sample Identification												Microbac - Baltimore 2102 Van Deman Street Holabird Business Park Baltimore, MD 21224 phone: 410-633-1800 cell: 443-386-4170											
9/11/09	1330	X		SW-A-01	3	X	X	X									After hours sample delivery hotline: 443-386-1659										
	1355	X		SW-B-01	3	X	X	X									Attn: Micheal Arbaugh										
	1340	X		SW-C-01	3	X	X	X									Remarks										
	1405	X		SW-D-01	3	X	X	X																			
	1430	X		SW-E-01	3	X	X	X																			
	1450	X		SW-F-01	3	X	X	X																			
	1530	X		SW-G-01	3	X	X	X																			
	1555	X		SW-H-01	3	X	X	X																			
	1645	X		SW-I-01	3	X	X	X																			
	1830	X		SW-J-01	3	X	X	X																			
N	1555	X		SW-H-QC-01	3	X	X	X																			
Sampled by: (Signature)				Date/Time		Relinquished by: (Signature)				Date/Time																	
				9/11/09 1720						9/11/09 1955																	
Relinquished by: (Signature)				Date/Time		Received by Laboratory: (Signature)				Date/Time																	
										9/11/10 19:55																	

The Microbac logo consists of the word "Microbac" in a white, serif font, centered within a black rectangular box. A small registered trademark symbol (®) is located to the upper right of the box.

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Fax: 410-633-6553
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COVER LETTER

Christine Papageorgis
EA Engineering
15 Loveton Circle
Sparks, MD 21152
RE: Calvert Cliffs Stormwater

October 30, 2009
Report No.: 09I1139

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 09/29/2009 15:55.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Notes and Definitions
- Cooler Receipt Log
- Chain of Custody

A handwritten signature in black ink, reading "Melanie C. Duszynski".

10/30/2009

Final report reviewed by:

Melanie C. Duszynski For Lisa M. Grant/Project Manager

Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact the Director or Trevor Boyce, President at tboyce@microbac.com or Robert Morgan, Chief Operation Officer, at rmorgan@microbac.com.



Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
SW-A-02	0911139-01	Surface Water	Not Specified	09/28/2009 13:54	09/29/2009 15:55
SW-B-02	0911139-02	Surface Water	Not Specified	09/28/2009 13:20	09/29/2009 15:55
SW-C-02	0911139-03	Surface Water	Not Specified	09/28/2009 12:57	09/29/2009 15:55
SW-D-02	0911139-04	Surface Water	Not Specified	09/28/2009 12:00	09/29/2009 15:55
SW-F-02	0911139-05	Surface Water	Not Specified	09/28/2009 11:25	09/29/2009 15:55
SW-G-02	0911139-06	Surface Water	Not Specified	09/28/2009 14:40	09/29/2009 15:55
SW-H-02	0911139-07	Surface Water	Not Specified	09/28/2009 15:17	09/29/2009 15:55
SW-I-02	0911139-08	Surface Water	Not Specified	09/28/2009 15:44	09/29/2009 15:55
SW-J-02	0911139-09	Surface Water	Not Specified	09/28/2009 12:31	09/29/2009 15:55
SW-B-QC-02	0911139-10	Surface Water	Not Specified	09/28/2009 13:20	09/29/2009 15:55

Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Baltimore Division

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Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SW-A-02

0911139-01 (Surface Water) Sampled: 09/28/2009 13:54; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	ND	3.0	mg/L	093009 0918	100509 0920	LCR	SM (20) 5210B	A18
Nitrogen, Total as N	0.26	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.029	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	6.4	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.26	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	9.6	4.0	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	11	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SW-B-02

0911139-02 (Surface Water) Sampled: 09/28/2009 13:20; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	3.9	3.0	mg/L	093009 0921	100509 0927	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.49	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.020	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	6.3	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.49	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	12	4.0	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	10	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	3.2	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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Baltimore Division

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Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering 15 Loveton Circle Sparks, MD 21152	Project: Calvert Cliffs Stormwater Project Number: 1462104.00 Project Manager: Christine Papageorgis	Report: 0911139 Reported: 10/30/2009 13:19
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SW-C-02

0911139-03 (Surface Water) Sampled: 09/28/2009 12:57; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	ND	3.0	mg/L	093009 0929	100509 0935	LCR	SM (20) 5210B	A18
Nitrogen, Total as N	0.41	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.10	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.019	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	6.6	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.41	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	16	4.0	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	11	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	3.3	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Baltimore Division

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Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSISEA Engineering
15 Loveton Circle
Sparks, MD 21152Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine PapageorgisReport: 0911139
Reported: 10/30/2009 13:19**SW-D-02****0911139-04 (Surface Water) Sampled: 09/28/2009 12:00; Type: Not Specified**

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division**Wet Chemistry**

BOD	4.6	3.0	mg/L	093009 0934	100509 0945	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.22	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.051	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	7.8	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.22	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	2.4	2.0	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	1.3	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	3.4	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division



Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SW-F-02

0911139-05 (Surface Water) Sampled: 09/28/2009 11:25; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	5.2	3.0	mg/L	093009 0937	100509 0949	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.34	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.025	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	7.4	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.34	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	ND	10	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	8.2	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SW-G-02

0911139-06 (Surface Water) Sampled: 09/28/2009 14:40; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	5.7	3.0	mg/L	093009 0942	100509 1000	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.30	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.031	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	6.8	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.30	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	ND	10	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	8.3	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	2.7	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SW-H-02

0911139-07 (Surface Water) Sampled: 09/28/2009 15:17; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	6.3	3.0	mg/L	093009 0950	100509 1006	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.27	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.038	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	7.4	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.27	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	2.8	2.0	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	7.0	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Baltimore Division

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Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SW-I-02

0911139-08 (Surface Water) Sampled: 09/28/2009 15:44; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	3.8	3.0	mg/L	093009 0953	100509 1012	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.25	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.037	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	7.5	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.25	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	4.8	2.0	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	5.0	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	3.7	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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Baltimore Division

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Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SW-J-02

0911139-09 (Surface Water) Sampled: 09/28/2009 12:31; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	3.6	3.0	mg/L	093009 0957	100509 1016	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.38	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.019	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	7.4	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.38	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	12	2.0	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	8.9	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Baltimore Division

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Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

SW-B-QC-02

0911139-10 (Surface Water) Sampled: 09/28/2009 13:20; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	5.2	3.0	mg/L	093009 0959	100509 1020	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.38	0.10	mg/L	100109 0732	100109 1317	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	100109 0732	100109 0732	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.013	0.010	mg/L	100109 1000	100209 0822	VAS	EPA 365.1	
pH	7.1	0.10	pH Units	093009 1505	093009 1521	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.38	0.10	mg/L	093009 1100	100109 1317	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	12	4.0	mg/L	093009 1000	100109 0800	LCR	SM (20) 2540D	
Turbidity	9.0	0.10	NTU	093009 0700	093009 0700	VAS	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	100609 1030	100709 1533	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: 1462104.00
Project Manager: Christine Papageorgis

Report: 0911139
Reported: 10/30/2009 13:19

Notes and Definitions

- J Analyte concentration is greater than the MDL but less than the reporting limit.
- H6 Sample received past holding time; analysis best performed at time of collection.
- A18 Sample did not meet the minimum dissolved oxygen depletion in any dilution analyzed, result is estimated.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

Certifications

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

- A2LA (Microbiology): 410.02
- A2LA (Environmental): 410.01
- A2LA (ELLAP): 410.01
- CPSC: 1115
- Maryland: 109
- Pennsylvania (NELAC): 68-00339
- USDA: S-53726
- Virginia: 00152

Cooler Receipt Log

Cooler ID: Default Cooler

Cooler Temp: 3.10 °C

Custody Seals Intact: Yes

COC/Containers Agree: Yes

Containers Intact: Yes

Correct Preservation: Yes

Received On Ice: Yes

Correct Number of Containers Received: Yes

Radiation Scan Acceptable: Yes

Sufficient Sample Volume for Testing: Yes

COC Present: Yes

Samples Received in Proper Condition: Yes

Comments:

Cooler Receipt Form / Sample Acceptance & Noncompliance Form

Number of Coolers Received: 2
 Client: EA Engineering
 Form Completed By: Jill

Receipt Date / Time: 9/20/04 1555
 Work Order # _____

Shipper: _____
 Custody Tape Intact: _____
 Containers Intact: _____
 Sample Received on Ice or refrigerated: _____

☒ Microbac ☐ Client ☐ UPS ☐ FedEx

YES / NO / NA

YES / NO

YES / NO

Temperature: _____ °C or

Infrared (IR) Temperature: 31.1 °C 2.9

☒ Negative or _____ mR/hr

YES / NO

YES / NO

YES / NO / Not Checked

YES / No (If No, contact client immediately)

YES / NO / NA

Water Soil Wipes Oil Filter Solid
 Sludge Food Other

Radiation Scan: _____
 Chain of Custody Present with shipment: _____
 Sample Bottle IDs agree with COC: _____
 Preservation requirements met: _____
 Correct Number of Containers / Sample Volume: _____
 Headspace in container: _____
 Type of Sample: _____

Container Type / Quantity:

A - _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 B - _____ Unpreserved 10 H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 C - _____ Unpreserved _____ H₂SO₄ _____ HNO₃ 10 HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 D - _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 E - _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 H - 10 Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 K - _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 L - _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 M - _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 W - _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 V - _____ Unpreserved _____ HCl _____ HCl / Ascorbic Acid _____ HCl / NaTHIO (Checked at time of Analysis)
 F - _____ Unpreserved _____ NaTHIO (Checked at time of Analysis)
 S - _____ Unpreserved _____ NaTHIO (Checked at time of Analysis)
 SN - _____ Unpreserved _____ NaTHIO _____ NaTHIO/EDTA (Checked at time of Analysis)
 J - _____ Unpreserved _____

_____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)
 _____ Unpreserved _____ H₂SO₄ _____ HNO₃ _____ HCl _____ NaOH _____ NaOH/Ascorbic Acid _____ Other(_____)

Describe preservation requirements not met:

All Acid preserved < 2 pH NaOH preserved > 12 pH All others > 2 and < 10 (usually 4-8)

Sample ID: _____ H₂SO₄ _____ HNO₃ _____ NaOH _____ mls added

Sample ID: _____ H₂SO₄ _____ HNO₃ _____ NaOH _____ mls added

Sample ID: _____ H₂SO₄ _____ HNO₃ _____ NaOH _____ mls added

Sample ID: _____ H₂SO₄ _____ HNO₃ _____ NaOH _____ mls added

H₂SO₄ - Sulfuric Acid, HNO₃ - Nitric Acid, NaOH - Sodium Hydroxide, ASC - Ascorbic Acid, NaTHIO - Sodium Thiosulfate

Describe Anomalies: _____

Contact information / Summary of Actions:

Date / Time: _____ Contact: _____ Contact By: _____

Comments: _____



Microbac Laboratories, Inc.
Baltimore Division
2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800
Fax: 410-633-6553
www.microbac.com

COVER LETTER

Christine Papageorgis
EA Engineering
15 Loveton Circle
Sparks, MD 21152
RE: Calvert Cliffs Stormwater

October 30, 2009
Report No.: 09J0758

The report of analyses contains test results for samples received at Microbac Laboratories, Inc., Baltimore Division on 10/16/2009 15:50.

The enclosed results were obtained from and applicable to the sample(s) as received at the laboratory. All sample results are reported on an "as received" basis unless otherwise noted.

All data included in this report has been reviewed and meet the applicable project and certification specific requirements, unless otherwise noted.

This report has been paginated in its entirety and shall not be reproduced except in full, without the written approval of Microbac Laboratories, Inc.

We appreciate the opportunity to service your analytical needs. If you have any questions, please feel free to contact us.

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Notes and Definitions
- Cooler Receipt Log
- Chain of Custody

10/30/2009

Final report reviewed by:

Melanie C. Duszynski For Lisa M. Grant/Project Manager

Report issue date

All samples received in proper condition and results conform to ISO 17025 standards unless otherwise noted.

If we have not met or exceeded your expectations, please contact the Director or Trevor Boyce, President at tboyce@microbac.com or Robert Morgan, Chief Operation Officer, at rmorgan@microbac.com.



Microbac Laboratories, Inc.

Baltimore Division

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Phone: 410-633-1800

Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SAMPLE SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
SW-A-03	09J0758-01	Stormwater	Not Specified	10/16/2009 13:25	10/16/2009 15:50
SW-B-03	09J0758-02	Stormwater	Not Specified	10/16/2009 13:15	10/16/2009 15:50
SW-C-03	09J0758-03	Stormwater	Not Specified	10/16/2009 13:35	10/16/2009 15:50
SW-D-03	09J0758-04	Stormwater	Not Specified	10/16/2009 11:00	10/16/2009 15:50
SW-F-03	09J0758-05	Stormwater	Not Specified	10/16/2009 11:50	10/16/2009 15:50
SW-G-03	09J0758-06	Stormwater	Not Specified	10/16/2009 12:09	10/16/2009 15:50
SW-H-03	09J0758-07	Stormwater	Not Specified	10/16/2009 12:15	10/16/2009 15:50
SW-I-03	09J0758-08	Stormwater	Not Specified	10/16/2009 12:40	10/16/2009 15:50
SW-J-03	09J0758-09	Stormwater	Not Specified	10/16/2009 10:24	10/16/2009 15:50
SW-B-QC-03	09J0758-10	Stormwater	Not Specified	10/16/2009 13:15	10/16/2009 15:50

Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SW-A-03

09J0758-01 (Stormwater) Sampled: 10/16/2009 13:25; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	4.3	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.47	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.055	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	6.6	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.47	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	16	10	mg/L	102009 0930	102009 0942	LCR	SM (20) 2540D	
Turbidity	22	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Baltimore Division

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Phone: 410-633-1800

Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering 15 Loveton Circle Sparks, MD 21152	Project: Calvert Cliffs Stormwater Project Number: Calvert Cliffs Stormwater Project Manager: Christine Papageorgis	Report: 09J0758 Reported: 10/30/2009 13:24
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SW-B-03

09J0758-02 (Stormwater) Sampled: 10/16/2009 13:15; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	4.2	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.49	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.033	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	6.5	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.49	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	33	10	mg/L	102009 0930	102009 0942	LCR	SM (20) 2540D	
Turbidity	27	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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Fax: 410-633-6553

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CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SW-C-03

09J0758-03 (Stormwater) Sampled: 10/16/2009 13:35; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	4.0	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.62	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.059	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	6.6	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.62	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	18	10	mg/L	102009 0930	102009 0943	LCR	SM (20) 2540D	
Turbidity	24	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	3.8	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SW-D-03

09J0758-04 (Stormwater) Sampled: 10/16/2009 11:00; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	4.7	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.57	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	0.20	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.055	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	7.1	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.36	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	6.0	2.0	mg/L	102009 0930	102009 0943	LCR	SM (20) 2540D	
Turbidity	6.1	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSISEA Engineering
15 Loveton Circle
Sparks, MD 21152Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine PapageorgisReport: 09J0758
Reported: 10/30/2009 13:24**SW-F-03****09J0758-05 (Stormwater) Sampled: 10/16/2009 11:50; Type: Not Specified**

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division**Wet Chemistry**

BOD	4.9	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.43	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.026	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	6.3	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.43	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	15	10	mg/L	102009 0930	102009 0943	LCR	SM (20) 2540D	
Turbidity	14	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division



Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SW-G-03

09J0758-06 (Stormwater) Sampled: 10/16/2009 12:09; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	7.8	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.36	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.034	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	6.8	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.36	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	6.4	4.0	mg/L	102009 0930	102009 0943	LCR	SM (20) 2540D	
Turbidity	14	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

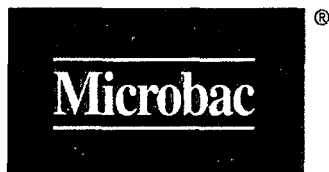
Oil & Grease	2.5	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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Baltimore Division

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Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SW-H-03

09J0758-07 (Stormwater) Sampled: 10/16/2009 12:15; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	5.1	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.39	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.092	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	6.9	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.39	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	ND	10	mg/L	102009 0930	102009 0944	LCR	SM (20) 2540D	
Turbidity	12	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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Microbac Laboratories, Inc.

Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SW-I-03

09J0758-08 (Stormwater) Sampled: 10/16/2009 12:40; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	4.9	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.32	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.045	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	7.2	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.32	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	ND	10	mg/L	102009 0930	102009 0944	LCR	SM (20) 2540D	
Turbidity	13	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	ND	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszyński

Melanie C. Duszyński For Lisa M. Grant, Project Manager

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Baltimore Division

2101 Van Deman Street • Baltimore, MD 21224

Phone: 410-633-1800

Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SW-J-03

09J0758-09 (Stormwater) Sampled: 10/16/2009 10:24; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	4.7	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.34	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.022	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	7.3	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.34	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	19	10	mg/L	102009 0930	102009 0944	LCR	SM (20) 2540D	
Turbidity	19	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	3.3	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C. Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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Baltimore Division

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Phone: 410-633-1800

Fax: 410-633-6553

www.microbac.com

CERTIFICATE OF ANALYSIS

EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

SW-B-QC-03

09J0758-10 (Stormwater) Sampled: 10/16/2009 13:15; Type: Not Specified

Analyte	Result	Reporting Limit	Units	Prepared	Analyzed	Analyst	Method	Notes
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Microbac Laboratories, Inc., Baltimore Division

Wet Chemistry

BOD	8.3	3.0	mg/L	101609 2111	102109 1300	LCR	SM (20) 5210B	
Nitrogen, Total as N	0.55	0.10	mg/L	102009 1412	102009 1412	VAS	Calculation	
Nitrate/Nitrite as N	ND	0.05	mg/L	102009 1412	102009 1412	VAS	EPA 353.2	
Phosphorus, Total (as P)	0.033	0.010	mg/L	101709 0430	101709 0801	VAS	EPA 365.1	
pH	6.1	0.10	pH Units	101909 1430	101909 1605	LCR	SM (20) 4500H B	H6
Total Kjeldahl Nitrogen	0.55	0.10	mg/L	101709 0540	101809 1129	VAS	SM(20)4500N-org/NH3-G	
Total Suspended Solids	41	10	mg/L	102009 0930	102009 0944	LCR	SM (20) 2540D	
Turbidity	28	0.10	NTU	101709 0033	101709 0033	BMC	EPA 180.1	

Oil and Grease

Oil & Grease	2.8	5.0	mg/L	102609 1000	102709 1508	BAB	EPA 1664A	J
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Microbac Laboratories, Inc., Baltimore Division

Melanie C Duszynski

Melanie C. Duszynski For Lisa M. Grant, Project Manager

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EA Engineering
15 Loveton Circle
Sparks, MD 21152

Project: Calvert Cliffs Stormwater
Project Number: Calvert Cliffs Stormwater
Project Manager: Christine Papageorgis

Report: 09J0758
Reported: 10/30/2009 13:24

Notes and Definitions

J	Analyte concentration is greater than the MDL but less than the reporting limit.
H6	Sample received past holding time; analysis best performed at time of collection.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Certifications

Below is a list of certifications maintained by Microbac Laboratories, Inc. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

- A2LA (Microbiology): 410.02
- A2LA (Environmental): 410.01
- A2LA (ELLAP): 410.01
- CPSC: 1115
- Maryland: 109
- Pennsylvania (NELAC): 68-00339
- USDA: S-53726
- Virginia: 00152

Cooler Receipt Log

Cooler ID: Default Cooler

Cooler Temp: 3.10 °C

Custody Seals Intact: Yes

COC/Containers Agree: Yes

Containers Intact: Yes

Correct Preservation: Yes

Received On Ice: Yes

Correct Number of Containers Received: Yes

Radiation Scan Acceptable: Yes

Sufficient Sample Volume for Testing: Yes

COC Present: Yes

Samples Received in Proper Condition: Yes

Comments:

[illegible]

[illegible]