Alachua County Environmental Protection Department

Chris Bird, *Director*

June 18, 2010

Mr. Scott Miller
Remedial Project Manager
U.S. EPA Region 4
61 Forsyth Street, SW
Atlanta, GA 30303

Re: Supplemental Koppers Superfund Site Drainage Ditch and Springstead Creek Stormwater Sampling Results – Task 6 Cooperative Assistance Agreement #V97468702

Dear Mr. Miller:

This letter reports the results of stormwater sampling conducted on the Koppers Drainage Ditch and Springstead Creek by the Alachua County Environmental Protection Department (ACEPD) as part of Task 6 of the Cooperative Assistance Agreement V97468702 with USEPA. These sampling results supplement the preliminary stormwater sampling data previously submitted by ACEPD to USEPA on December 1, 2009. This letter also describes the last phase of sampling proposed by ACEPD under Task 6 to fill data gaps and complete the stormwater sampling. This last event will involve a change in scope from the original sampling plan.

Sampling Events and Parameter Coverage

ACEPD staff collected stormwater samples from the Koppers Ditch and Springstead Creek on and near the Koppers Superfund Site during two separate time periods, a two day time period December 4 and 5, 2009 and a single day period, March 11, 2010. **Figure 4** at the end of this report shows the sampling locations. **Table 1** lists the sampling locations for each sampling period and the corresponding Map Location in Figure 4.

During the December 2009 event, stormwater samples were collected from five total locations (these are identified in this report with their corresponding Map ID in parentheses) which included: the Koppers Ditch upstream at NW 23rd Ave (ID5), the Koppers Ditch outfall on City of Gainesville Public Works property(ID4), the Koppers Ditch outfall upstream of Springstead Creek(ID2), Springstead Creek upstream of the Koppers Ditch outfall (ID1), and Springstead Creek downstream of the Koppers Ditch outfall(ID3).

It was ACEPD's intention to collect "first flush" samples during each sampling event from all five sampling locations. However, logistics of the December 2009 event made it difficult to obtain "first flush" samples from both the upstream sample site and the outfall, since the majority of rainfall occurred overnight in the early morning hours of December 5, 2009. The "first flush" upstream sample on the Koppers Ditch at NW 23rd Avenue (ID5) was sampled late Friday afternoon, December 4, 2009. Subsequent sampling of the Koppers ditch outfall on City Public Works property(ID4), the Koppers ditch outfall upstream of Springstead Creek (ID2) and the remaining Springstead Creek locations (ID1, ID3)

began at daylight Saturday morning, December 5, 2009. During this two-day event, samples were obtained twice at all five sampling locations (Tables 1 and 2). Total rainfall for the December 4-5, 2009 event was 1.5 inches as measured at a temporary rain gage installed adjacent to the Koppers Ditch near NW 23rd Avenue.

The March 11, 2010 sampling was conducted only at the Koppers Ditch outfall on City Public Works property (ID4) and samples obtained were representative of the "first flush" at that location. A total of 0.93 inches of rain was reported at the nearby Gainesville Airport for the March 11, 2010 sampling event.

Table 1. Sample Locations for December 2009 and March 2010 Stormwater Sampling Events

Map ID (Fig. 4)	Sampling Location Description	12/4/2009	12/5/2009 Round 1	12/5/2009 Round 2	3/11/2010
1	Springstead Creek upstream of Koppers Ditch outfall	NS	X	X	NS
2	Koppers Ditch Outfall upstream of Springstead Creek	NS	X	X	NS
3	Springstead Creek downstream of Koppers Ditch Outfall	NS	X	X	NS
4	Koppers Ditch Outfall on City Public Works property	NS	X	X	X (FF)
5	Koppers Ditch upstream at NW 23rd Ave	X (FF)	NS	X	NS

(FF) – First Flush Samples NS -- Not Sampled

Samples were collected for the suite of analytical parameters proposed in the sampling plan. Parameters included field measurements (pH, specific conductance, temperature, dissolved oxygen, and turbidity) and velocity or flow at the Koppers Ditch at NW 23rd Ave (ID5) and the Koppers Ditch outfall on City Public Works property (ID4). Laboratory parameters varied among locations and times during the events, with "first flush" samples having the greater number of analytes since the highest concentrations of constituents were anticipated to be observed in these samples (**Table 2**).

Laboratory parameters for the "first flush" sample collected at the Koppers ditch upstream NW 23rd Ave location (ID5) on December 4, 2009 and the Round 1 sample collected at the Koppers outfall on City Public Works property (ID4) on March 11, 2010 included metals (aluminum, arsenic, calcium, chromium (as total, Cr III, and Cr IV), copper, iron, and magnesium), specific conductance, pH, turbidity, hardness, total suspended solids (TSS), volatile organic compounds (VOCs), semi-volatile compounds (SVOCs), pentachlorophenol (PCP), and dioxins and furans as TCDD equivalents. Samples from Springstead Creek (ID1 and ID 3)and the Koppers ditch outfall upstream of the creek (ID2) included field parameters and stage (water depth above the streambed) in Springstead Creek (but excluding velocity or flow), metals, specific conductance, pH, turbidity, hardness, and TSS.

One field blank was prepared for all parameters using analyte-free water provided by the laboratory, TestAmerica – Tallahassee. TestAmerica, Inc. Laboratories conducted all analyses. Most constituents were analyzed at the TestAmerica Tallahassee lab, with hexavalent chromium and dioxins analyses preformed by their laboratories in Tampa and Sacramento, respectively.

Table 2. Parameter Coverage for Sampling Events Conducted December 4-5, 2009 and March 11, 2010.

Map ID (Fig. 4)	Sampling Location Description	Sampling Parameter Coverage			
		12/4/2009	12/5/2009 Round 1	12/5/2009 Round 2	3/11/2010
1	Springstead Creek upstream of Koppers Ditch outfall	NS	Field Meas.*, Inorganic Indicators**, Metals***	Field Meas.*, Inorganic Indicators**, Metals***	NS
2	Koppers Ditch upstream of Springstead Creek	NS	Field Meas., Inorganic Indicators, Metals	Field Meas., Inorganic Indicators, Metals	NS
3	Springstead Creek downstream of Koppers Ditch Outfall	NS	Field Meas., Inorganic Indicators, Metals	Field Meas., Inorganic Indicators, Metals	NS
4	Koppers Ditch outfall on City Public Works property	NS	Field Meas., Flow, Inorganic Indicators, Metals, VOCs****, SVOCs#, PCP##, Dioxins###	Field Meas., Flow, Inorganic Indicators, Metals, SVOCs, PCP	Field Meas., Flow, Inorganic Indicators, Metals, VOCs, SVOCs, PCP, Dioxins
5	Koppers Ditch upstream at NW 23rd Ave	Field Meas., Flow, Inorganic Indicators, Metals, VOCs, SVOCs, PCP, Dioxins	Field Meas., Flow, Inorganic Indicators, Metals, SVOCs, PCP	NS	NS
	Field Blank	NS	Field Meas., Flow, Inorganic Indicators, Metals, VOCs, SVOCs, PCP, Dioxins	NS	NS

*pH, Specific Conductance, Turbidity, Temperature and Dissolved Oxygen
** pH, Specific Conductance, Turbidity, Total Suspended Solids (TSS), and Hardness
***Aluminum, Arsenic, Calcium, Total Chromium, Chromium III, Chromium VI, Copper, Iron and Magnesium
****Volatile organic compounds
#Semivolatile organic compounds
##Pentachlorophenol
###Dioxins as total 2,3,7,8 – TCDD Toxic Equivalents
NS-Not sampled

Sampling Results -- Koppers Ditch Upstream at NW 23rd Ave and Koppers Ditch Outfall at City Public Works Property

The testing results for samples collected in the Koppers ditch at NW 23rd Avenue (ID5) on December 4, 2009 and at the Koppers Ditch outfall on City Public Works property (ID4) on December 5, 2009 (Round 1) and March 11, 2010 are presented below in **Tables 3 and 4**.

Table 3. Koppers Ditch and Outfall Inorganics, Metals Sample Results for the December 4-5, 2009 and March 11, 2010 Stormwater Sampling Events.

Parameter	Koppers Ditch Upstream at NW 23rd Ave (First Flush)	Koppers Ditch Outfall on City Public Works Property (Round 1)	Koppers Ditch Outfall on City Public Works Property (First Flush)	Benchmark* or Surface Water Criteria#
Map ID (Fig 4)	5	4	4	
Sample Date	12/4/2009	12/5/2009	3/11/2010	
Sample Time	1630 hr	0655 hr	1130 hr	
Flow (Cubic Ft/sec)	0.29 cfs	3.84 cfs	5.21 cfs	NA
Hardness (as CaCO3)	98 mg/L	67 mg/L	310 mg/L	NS
Turbidity (laboratory)	60 NTU	55 NTU, Q***	300 NTU, Q***	29 NTUs above background#
Total Suspended Solids (TSS)	41 mg/L	33 mg/L	350 mg/L	NS
Copper	14 ug/L **	**29 ug/L**	**150 ug/L**	63.6 ug/L* 9 ug/L (12/4/09)# 7 ug/L (12/5/09)# 25 ug/L (3/11/10)#
Chromium (total)	3.6 ug/L**	53 ug/L	210 ug/L	NS
Chromium (III)	3.6 ug/L**, Q***	53 ug/L , Q***	210 ug/L	85 ug/L (12/4/09)# 62 ug/L (12/5/09)# 218 ug/L (3/11/10)#
Chromium (VI)###	< 2.4 ug/L , Q***	< 2.4 ug/L, Q***	< 1.4 ug/L	≤ 11 ug/L#
Arsenic	7.3 ug/L **	**71** ug/L	**180** ug/L	168.54 ug/L* ≤ 50 ug/L##
Aluminum	780 ug/L	1,300 ug/L	6,000 ug/L	NS
Calcium	34,000 ug/L	25,000 ug/L	120,000 ug/L	NS
Iron	820 ug/L	520 ug/L	**3,700 ug/L**	1.0 mg/L
Magnesium	3,300 ug/L	1,100 ug/L	2,800 ug/L	NS

NA – Not Applicable NS – None Specified

** Benchmarks for the wood treatment industry Stormwater Multi-Sector General Permit Federal Register Table 5. Parameter Benchmark Values based on assumed hardness value of 100 mg/L (USEPA, 1995).*

*** - Sample result is below the practical quantitation limit (PQL)*

*Q*** – Sample held beyond acceptable holding times.*

#Surface Water Criteria for Copper and Chromium calculated using sample specific hardness values as set forth in Chapter 62-302.530 FAC (FDEP, 2008a).

##Surface Water Criteria Chapter 62-302.530 FAC (FDEP, 2008a).

Hexavalent chromium reported at 7.5ug/L which is between lab PQL and MDL in Round 2 at Map ID 4. Hexavalent chromium reported at 13 ug/L in Round 2 at Map ID 5.

Samples collected on December 4, 2009 at the upstream Koppers Ditch sample site (NW 23rd Avenue) (ID5) were "first flush." Samples collected on December 5, 2009 downstream at the Koppers ditch outfall on City Public Works property(ID4) were "non-first flush" samples collected after significant rainfall during the early morning hours (**Figure 1**), and are more representative of the receding portion of the hydrograph following peak flow than "first flush" conditions and constituents were generally measured in lower concentrations.

Figure 1 ACEPD staff measuring velocity at the Koppers Outfall on City Public Works property December 5, 2009.

The data for inorganic indicators, such as hardness and suspended solids, from both the upstream and outfall ditch sampling locations for the December 2009 sampling event were similar. The concentrations of copper, chromium, and arsenic in the "non-first flush" outfall samples (ID4) collected on December 5, 2009 were elevated relative to the upstream sample (ID5), however neither copper nor arsenic concentrations exceeded the FDEP Wood Treatment Industry Stormwater Multi-Sector General Permit Benchmark concentrations (Benchmarks). The arsenic concentration at the outfall, 71 ug/L, did exceed the 50 ug/L FDEP Surface Water Criteria for Class III Fresh Water. Subsequent samples, Round 2, taken further into the storm event showed detectable but decreasing concentrations of most constituents at the outfall and are not included in Table 3.

Samples from the Koppers ditch outfall (ID4) were observed to contain greater quantities of trivalent chromium (Cr III) than those found in upstream samples at the Koppers ditch at NW 23rd Ave (ID5), which is consistent with the use of chromated copper arsenate (CCA) for wood preservation. CCA composition based on the Koppers, Inc. Material Safety Data Sheet (MSDS) is 1.0-3.1 percent chromium III (Koppers, Inc., 2010). As shown in Table 3, hexavalent chromium (Cr IV) was not detected (<2.4 ug/L) in the "first flush" upstream sample of the Koppers Ditch at NW 23rd Avenue (ID5) taken on December 4, 2009. However a subsequent sample taken on December 5, 2009 at this location (see

footnote Table 3) representing a sample much later in the storm event had hexavalent chromium concentration of 13 ug/L. Round 1 sampling on December 5, 2009 at the Koppers Ditch outfall on City Public Works property (ID4) did not detect hexavalent chromium above the method detection limit (<2.4 ug/L) however, Round 2 sampling later in the flow event on the same date (see footnote in Table 3) did detect hexavalent chromium at a low concentration of 7.5 ug/L which was between the practical quantitation limit (PQL) and the laboratory method detection limit (MDL). The colorimetric test method for hexavalent chromium is subject to interferences and some of the samples exceeded sample holding times. Therefore the detection of hexavalent chromium may not be accurate and needs to be verified.

The samples from the Koppers ditch outfall on City Public Works property (ID4) collected on March 11, 2010 were "first flush" samples that were obtained within 10-15 minutes of flow being observed from the Koppers ditch outfall culvert on City Public Works property (**Figures 2. and 3**.). These samples were also collected without a 72 antecedent dry period, but are still representative of typical conditions in Florida where rains are frequent. Under storm flow conditions, flow (discharge) in the ditch exiting the Koppers property (ID4) was more than an order of magnitude greater than that measured at the upstream sample site south of NW 23rd Avenue (Table 3.).

Figure 2 ACEPD staff collecting storm event samples at the Koppers Outfall on City Public Works property March 11, 2010.

Figure 3. March 11, 2010 stormwater samples collected from the Koppers Ditch Outfall.

The results of the March 2010 sampling of the Koppers Ditch outfall on City Public Works property (ID4) showed higher concentrations of all constituents including metals as compared to the December 2009 sample event. Although only the outfall was sampled at this event, the turbidity, 300 NTU, greatly exceeded that observed at the upstream location in other sampling events, which ranged from 10 to 60 NTU over four sampling events in 2008 and 2009. Samples collected during the March event exceeded the Benchmarks for copper and arsenic and the Florida Fresh Water Class III Surface Water Criteria for copper, arsenic and iron (Table 3.). Hexavalent chromium was not detected above the method detection limit in the sample from the Koppers ditch outfall on City Public Works property (ID4) in the "first flush" sample taken on March 10, 2010.

Table 4 presents the VOC, SVOC, PCP, and Dioxin sample results from the Koppers ditch upstream(ID5) and Koppers Ditch outfall at City Public Works property(ID4) samples taken on December 4-5, 2009 and March 11, 2010. Organic compounds were generally present in low concentrations in stormwater samples collected from these locations. The only VOC detected was toluene, reportedly present in samples collected from the Koppers ditch upstream location near NW 23rd Avenue(ID5); no VOCs were detected in samples from the Koppers ditch outfall on City Public Works property. Low concentrations of SVOCs and PCP were detected in samples from both sampling locations, with the greater number of compounds reported in the March 2010 "first flush" samples from the Koppers ditch outfall on City Public Works property (ID4). All of the SVOCs detected, with the exception of bis (2-ethylhexyl) phthalate, were reported at estimated low concentrations between the method detection limit (MDL) and the practical quantitation limit (PQL).

Table 4. Koppers Ditch Upstream and Outfall VOC, SVOC, PCP, and Dioxin Sample Results for the December 4-5, 2009 and March 11, 2010 Stormwater Sampling Events.

Parameter	Koppers Ditch Upstream at NW 23rd Ave (First Flush)	Koppers Ditch Outfall on City Public Works Property	Koppers Ditch Outfall on City Public Works Property (First Flush)	Benchmark* or Surface Water Criteria##
Map ID (Fig 4)	5	4	4	
Sample Date	12/04/2009	12/05/2009	3/11/2010	
Sample Time	1630 hr	0655 hr	1130 hr	
Toluene	0.90 ug/L *	ND	ND	NS
Anthracene	ND	ND	1.1 ug/L *	< 110 mg/L
Benzo(a)anthracene	ND	ND	1.1 ug/L *	NS
Benzo(a)pyrene	ND	ND	1.2 ug/L *	NS
Benzo(b)fluoranthene	1.8 ug/L *	ND	2.5 ug/L *	NS
Benzo (k)fluoranthene	ND	ND	0.70 ug/L *	NS
Bis(2-ethylhexyl) phthalate	2.5 ug/L	3.1 ug/L	ND	NS
Chrysene	1.5 ug/L *	ND	1.7 ug/L *	NS
Di-n-butyl phthalate	ND	ND	0.54 ug/L *	NS
Fluoranthene	2.4 ug/L *	ND	2.7 ug/L*	< 0.370 mg/L
3 & 4 Methylphenol	1.1 ug/L *	ND	ND	NS
Phenanthrene	ND	ND	0.70 ug/L *	NS
Pyrene	2.0 ug/L *	ND	3.0 ug/L *	< 11 mg/L
PAHs#	**3.3** ug/L	None Reported	**7.9** ug/L	≤0.031 ug/L annual avg.
Pentachlorophenol (PCP)	0.042 ug/L *	0.89 ug/L	0.73 ug/L	≤ 30 ug/L
Dioxins (2,3,7,8-TCDD Toxic Equivalents (TEQ)	**19** pg/L	**600** pg/L	**4,900** pg/L	0.000000005 ug/L## (0.005 pg/L)

ND – Not detected
NS – Not Specified
**- Sample result is below the practical quantitation limit (PQL).*
*** Surface Water Criteria Chapter 62-302.530 FAC (FDEP, 2008a).*
#Calculated based the sum of the following PAHs: Acenaphthylene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo-(a,h)anthracene, Indeno(1,2,3-cd)pyrene and Phenanthrene per Chapter 62-302.530 FAC (FDEP, 2008a).
##Surface Water Cleanup Target Level Chapter 62-777 FAC (FDEP, 2008b)

For comparison with FDEP Surface Water Criteria for the polynuclear aromatic hydrocarbons (PAHs,) the sum of the concentrations of acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, dibenzo-(a,h)anthracene, indeno(1,2,3-cd)pyrene and phenanthrene was determined. The resulting sums (Table 4) calculated for the Koppers Ditch upstream NW 23rd Ave location (ID5) and the first flush sample at the Koppers ditch outfall (ID4) from March 2010 exceeded the criteria for annual averages, but no maximum criteria for individual samples are given. Two individual PAHs, fluoranthene and pyrene, have individual criteria, but none of these criteria were exceeded in the first flush sample obtained from the Koppers ditch

outfall (ID4). The first flush March 2010 sample from the Koppers ditch outfall (ID4) had approximately twice the estimated concentration of total PAHs, as compared to the upstream NW 23rd Ave sample. However, the total PAHs for this sample was still relatively low at 7.9 ug/L.

Low levels of total dioxins and furans, reported as 2,3,7,8-TCDD toxic equivalents (TEQ), were measured in the upstream Koppers Ditch NW 23rd Ave sample (ID5) and in the both the December 2009 and March 2010 Koppers Ditch outfall (ID4) samples. The Dioxin TEQ concentration reported in the Upstream Koppers Ditch NW 23rd Ave sample was 19 picograms per liter (picogram is 10^{-12} grams) which was very near the concentration found in the field blank (25 pg/L) and in one of the laboratory method blanks (58 pg/L). The dioxin concentration measured in the December 2009 and March 2010 downstream samples from the Koppers ditch Outfall on City Public Works property (ID4) were 600 pg/L and 4900 pg/L respectively, which is one to two orders of magnitude higher than the field blank and method blank and the upstream Koppers ditch sample (ID5) concentration. These data suggest that low levels of dioxins are possibly being released from the Koppers site under storm flow conditions. Dioxins in concentrations of thousands of ng/Kg (ppt) have been measured in soils in multiple locations on the Koppers site. Dioxin compounds have very low water solubility and adsorb very strongly to the particulate matter. Therefore it is likely that the dioxin found in these samples is primarily adsorbed to the suspended solids in the stormwater flow. There appears to be a correlation between the level of suspended solids in the storm water samples and the level of dioxin TEQ measure in the sample. The December 5, 2009 outfall sample had a Total Suspended Solids(TSS) of 33 mg/L and a dioxin TEQ of 600 pg/L, while the March 11, 2010 sample had a TSS of 350 mg/L and a dioxin TEQ of 4900 pg/L. Because of these stormwater results and the fact that low levels of dioxins were measured in the sediments in Springstead Creek downstream from the Koppers outfall in earlier stream sediment testing performed by ACEPD (ACEPD, 2009) and the presence of dioxins in the Koppers site surface soils, further confirmatory sampling is recommended to confirm these results.

Sampling Results-- Koppers Ditch Outfall upstream of Springstead and Springstead Creek Samples

Samples were also collected in Springstead Creek upstream (ID1) and downstream of the Koppers ditch Outfall (ID3) and from the Koppers Ditch outfall just upstream of Springstead Creek (ID2), as shown in Figure 4. All three sites were sampled twice during the December 2009 event. Inorganic indicators and metals concentrations were relatively low in all samples collected (**Table 5)**. Organic parameters were not tested for at these sample locations.

Copper and hexavalent chromium (Cr VI) concentrations in samples from the Koppers ditch Outfall upstream of the Springstead Creek (ID2) exceeded Florida Class III surface water criteria. Hexavalent chromium was reported at 45ug/L in one sample (Round 1) collected from the Koppers Ditch outfall upstream of Springstead Creek (ID2) on December 5, 2009. Hexavalent chromium was also reported at 14 ug/L in a Round 2 sample from Springstead Creek (ID1) upstream of the Koppers outfall. The reliability of this hexavalent chromium method is uncertain as the method is subject to interferences. The samples for hexavalent chromium were also analyzed outside sample holding times. The laboratory was asked to re-evaluate the data and no apparent errors were present in the data. Additional sampling is recommended to confirm these data results.

Elevated arsenic concentration was also measured at this location (ID2) but the levels did not exceed the Benchmark values or Florida Class III surface water criteria. There were no exceedances of surface water criteria in Springstead Creek downstream of the ditch outfall (ID1 and ID3). This was likely due to the amount of flow in the ditch relative to the amount in Springstead Creek itself, which was much

greater. Also, the samples collected in the creek were obtained after the "first flush" and probably contained lower concentrations of site related constituents.

Table 5. Springstead Creek Sample Results for the December 5, 2009 Stormwater Sampling Event First and Second Sampling Rounds.

Parameter	Sampling Round	Springstead Creek Upstream of Koppers Ditch	Koppers Ditch Outfall Upstream of Springstead Creek	Springstead Creek Downstream of Koppers Ditch	Benchmark* or Surface Water Criteria#
Map ID (Fig 4)		1	2	3	
Hardness (as CaCO3)	1 2	38 mg/L 59 mg/L	62 mg/L 68 mg/L	40 mg/L 57 mg/L	NS
Turbidity (Lab)	1 2	10 NTU, Q*** 10 NTU, Q***	41 NTU Q*** 10 NTU Q***	15 NTU Q*** 11 NTU Q***	NS
Total Suspended Solids (TSS)	1 2	10 mg/L 4.8 mg/L	35 mg/L 6.4 mg/L	9.0 mg/L 5.6 mg/L	NS
Copper	1 2	<2.4 ug/L <2.4 ug/L	**26** ug/L 4.5 ug/L**	<2.4 ug/L <2.4 ug/L	63.6 ug/L* 4, 6, 4,ug/L# 5, 7, 5 ug/L#
Chromium (total)	1 2	<1.5 ug/L <1.5 ug/L	41 ug/L 6.1 ug/L**	3.6 ug/L** <1.5 ug/L	NS
Chromium (III)	1 2	< 4.8 ug/L Q < 2.4 ug/L Q	< 2.4 ug/L Q 6.1 ug/L Q**	< 4.8 ug/L Q < 4.8 ug/L Q	39, 58, 41 ug/L# 56, 63, 54 ug/L#
Chromium (VI)	1 2	< 4.8 Q **14 ug/L** Q	**45** ug/L Q < 2.4 ug/L Q	< 4.8 ug/L Q < 4.8 ug/L Q	≤ 11 ug/L#
Arsenic	1 2	< 4.2 mg/L <4.2 mg/L	**57** ug/L 27 ug/L	6.7 ug/L <4.2 ug/L	168.54 ug/L* ≤ 50 ug/L##
Aluminum	1 2	980 ug/L 780 ug/L	1,300 ug/L 200 ug/L	900 ug/L 800 ug/L	NS
Calcium	1 2	13,000 ug/L 20,000 ug/L	23,000 ug/L 25,000 ug/L	14,000 ug/L 19,000 ug/L	NS
Iron	1 2	410 ug/L 320 ug/L	520 ug/L 190 ug/L	370 ug/L 340 ug/L	1.0 mg/L
Magnesium	1 2	1,400 ug/L 2,300 ug/L	1,000 ug/L 1,300 ug/L	1,300 ug/L 2,200 ug/L	NS

NS – None Specified
** Benchmarks for the wood treatment industry Stormwater Multi-Sector General Permit Federal Register Table 5. – Parameter Benchmark Values based on assumed hardness value of 100 mg/L (USEPA, 1995).*
***- Sample result is below the practical quantitation limit (PQL);*
Q – Sample held beyond acceptable holding times.
#Surface Water Criteria for Copper and Chromium calculated using sample specific hardness values as set forth in Chapter 62-302.530 FAC (FDEP, 2008a).
##Surface Water Criteria Chapter 62-302.530 FAC (FDEP, 2008a).

Under base flow conditions stream flow (discharge) in Springstead Creek near the Koppers site is on the order of 1 to 1.4 cfs. Storm flow conditions produce much greater flows and in February 2009 velocity measurements conducted by ACEPD staff on Springstead Creek during one storm event resulted in a

calculated discharge (flow) of 60.4 cfs. This determination was made upstream of the Koppers Ditch outfall upstream of Springstead Creek near Map ID 1. . This data indicates that stream flow in the ditch, 3.84 to5.21 cfs (Table 3.) under storm event conditions, is approximately an order of magnitude lower than flow in Springstead Creek under similar conditions. Under storm flow conditions constituents present in the Koppers ditch would be diluted approximately 10-fold when water from the ditch mixed with the water in Springstead Creek.

Proposed Revision in Scope for Remaining Storm Event Monitoring

Based on the results of the preliminary stormwater sampling data reported in the December 1, 2009 report to USEPA and the recent stormwater results reported in this letter, ACEPD proposes to reduce the analytical parameter coverage and utilize the remaining Task 6 stormwater sampling budget to complete one additional sampling event: an additional round of "first flush" sampling at the Koppers Ditch outfall on City Public Works property (ID4) in order to confirm the dioxin and elevated metals data reported in this latest sampling round, and at the upstream and downstream sample sites on Springstead Creek itself (ID1 and ID3). The parameters to be measured will only include, field measurements, inorganic indicators, metals and dioxins as shown in **Table 7** below.

Table 7. Proposed Sampling and Parameter Coverage for the Final Sampling Event.

Sample Location Description	Map Location	First Flush	Field Blank	Analytical Parameters
Koppers Ditch Outfall at City Public Works Property	ID4	1		Field Meas.*, Flow, Inorganic Indicators**, Metals***, Dioxins#
Springstead Creek downstream of Koppers Ditch	ID3	1	1	Field Meas.*, Inorganic Indicators**, Metals***, Dioxins#
Springstead Creek upstream of Koppers Ditch	ID1	1		Field Meas.*, Inorganic Indicators**, Metals***, Dioxins#
Total Number of Samples		**3**	**1**	**Total = 4 samples**

*pH, Specific Conductance, Turbidity, Temperature and Dissolved Oxygen

** pH, Specific Conductance, Turbidity, Total Suspended Solids (TSS), and Hardness

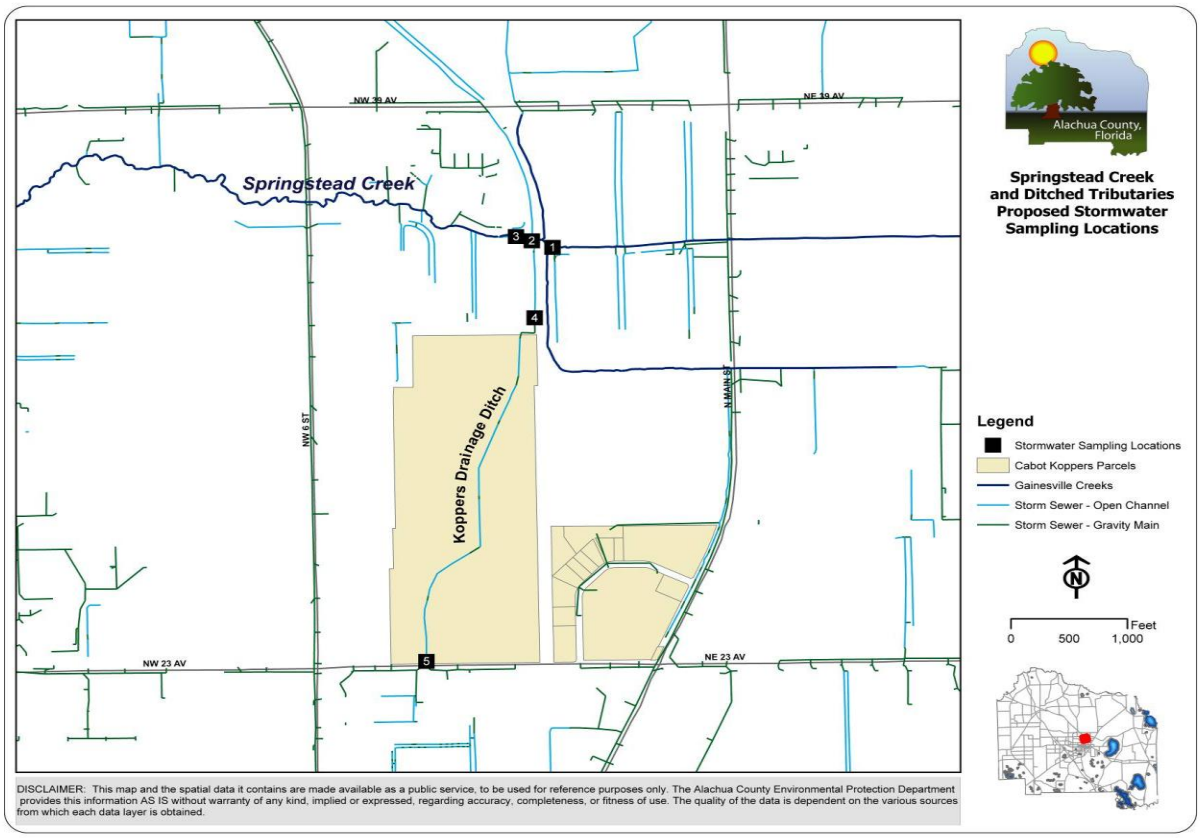
***Aluminum, Arsenic, Calcium, total Chromium, Chromium III, Chromium VI, Copper, Iron and Magnesium

#Dioxins and Furans as total 2,3,7,8 – TCDD Toxic Equivalents

Sincerely,

John J. Mousa, Ph.D.
Pollution Prevention Manager

Figure 4. Stormwater Sampling Locations



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ACEPD, 2009. *ACEPD Report on Sediment Quality Sampling on Springstead and Hogtown Creeks,* Dated August 14, 2009

ACEPD, 2009 (2)- *Preliminary Results and Changes in Scope of Work, Task 6—Stormwater Quality in Springstead Creek and the Koppers Drainage Ditch at Cabot-Koppers Superfund Site, EPA Cooperative Agreement #V97468702*, Dated December 1, 2009.