

Microbac

KNOXVILLE DIVISION
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STATE CERT ID.
 TN 02017

CHEMISTRY · MICROBIOLOGY · FOOD SAFETY · CONSUMER PRODUCTS
 WATER · AIR · WASTES · FOOD · PHARMACEUTICALS · NUTRACEUTICALS

CERTIFICATE OF ANALYSIS
PRELIMINARY REPORT

CITY OF KINGSTON
 CHUCK MOORE
 125 W. CUMBERLAND ST.
 KINGSTON, TN 37763

Date Reported
 Date Received 11/18/2009
 Cust P.O.
 Invoice No.
 Cust # C120
 Sample Date 11/18/2009
 Permit No. 0000360

Work Order Number: 0911-00722

Subject: KINGSTON WTP RAW AND FINISHED WATER SAMPLES

Test	Method	Result	Qual	Date	Time	Tech
001 RAW 11/18/09 0630						
[TAL METALS]					00:00	LL
ALUMINUM	EPA 200.7	0.261 MG/L		11/20/2009	10:36	LL
ANTIMONY	EPA 200.7	<0.0020 MG/L	M	11/20/2009	10:36	LL
ARSENIC	EPA 200.7	0.0290 MG/L	M	11/20/2009	10:36	LL
BARIUM	EPA 200.7	0.0224 MG/L		11/20/2009	10:36	LL
BERYLLIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:36	LL
CADMIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:36	LL
CHROMIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:36	LL
COBALT	EPA 200.7	<0.0010 MG/L		11/20/2009	10:36	LL
COPPER	EPA 200.7	0.0014 MG/L		11/20/2009	10:36	LL
IRON	EPA 200.7	0.389 MG/L		11/20/2009	10:36	LL
LEAD	EPA 200.7	<0.0010 MG/L	M	11/20/2009	10:36	LL
MAGNESIUM	EPA 200.7	3.55 MG/L	J+	11/19/2009	15:20	LL
MANGANESE	EPA 200.7	0.0510 MG/L		11/20/2009	10:36	LL
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:36	LL
MERCURY	EPA 245.1	<0.0002 MG/L		11/18/2009	17:02	JRT
NICKEL	EPA 200.7	<0.0010 MG/L		11/20/2009	10:36	LL
SELENIUM	EPA 200.7	<0.0020 MG/L	M	11/20/2009	10:36	LL
SILVER	EPA 200.7	<0.0010 MG/L		11/20/2009	10:36	LL
TIN	EPA 200.7	<0.0010 MG/L		11/20/2009	10:36	LL
TITANIUM	EPA 200.7	0.0054 MG/L		11/20/2009	10:36	LL
THALLIUM	EPA 200.7	<0.0020 MG/L	M	11/20/2009	10:36	LL
ZINC	EPA 200.7	0.0474 MG/L	J+	11/20/2009	10:36	LL
BORON	EPA 200.7	0.0063 MG/L		11/20/2009	10:36	LL
SOLIDS, TOTAL SUSPENDED	SM 2540.D.	9.35 MG/L		11/18/2009	13:00	JRT
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340.B.	54.7 MG/L	J+, N*	11/19/2009	15:20	LL

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002 RAW 11/18/09 0630 DISSOLVED METALS

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0100 MG/L		11/20/2009	11:08	LL
ANTIMONY	EPA 200.7	<0.0020 MG/L	M	11/20/2009	11:08	LL
ARSENIC	EPA 200.7	0.0266 MG/L	M	11/20/2009	11:08	LL
BARIUM	EPA 200.7	0.0198 MG/L		11/20/2009	11:08	LL
BERYLLIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:08	LL
CADMIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:08	LL
CHROMIUM	EPA 200.7	0.0015 MG/L		11/20/2009	11:08	LL
COBALT	EPA 200.7	<0.0010 MG/L		11/20/2009	11:08	LL
COPPER	EPA 200.7	0.0011 MG/L		11/20/2009	11:08	LL
IRON	EPA 200.7	0.0289 MG/L		11/20/2009	11:08	LL
LEAD	EPA 200.7	<0.0010 MG/L	M	11/20/2009	11:08	LL
MAGNESIUM	EPA 200.7	3.34 MG/L	J-, *	11/19/2009	14:23	LL
MANGANESE	EPA 200.7	<0.0050 MG/L		11/20/2009	11:08	LL
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:08	LL
MERCURY	EPA 245.1	<0.0002 MG/L		11/18/2009	17:35	JRT
NICKEL	EPA 200.7	<0.0010 MG/L		11/20/2009	11:08	LL
SELENIUM	EPA 200.7	<0.0020 MG/L	M	11/20/2009	11:08	LL
SILVER	EPA 200.7	<0.0010 MG/L		11/20/2009	11:08	LL
TIN	EPA 200.7	<0.0010 MG/L		11/20/2009	11:08	LL
TITANIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:08	LL
THALLIUM	EPA 200.7	<0.0020 MG/L	M	11/20/2009	11:08	LL
ZINC	EPA 200.7	0.0391 MG/L	J+	11/20/2009	11:08	LL
BORON	EPA 200.7	0.0069 MG/L		11/20/2009	11:08	LL
SILICA (SiO2)	EPA 200.7	5.68 MG/L		11/19/2009	14:23	LL

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Test	Method	Result	Qual	Date	Time	Tech
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003 **FINISHED 11/18/09 0630**

[TAL METALS]

					00:00	
ALUMINUM	EPA 200.7	0.0328 MG/L		11/20/2009	10:44	LL
ANTIMONY	EPA 200.7	<0.0020 MG/L	M	11/20/2009	10:44	LL
ARSENIC	EPA 200.7	0.0282 MG/L	M	11/20/2009	10:44	LL
BARIUM	EPA 200.7	0.0189 MG/L		11/20/2009	10:44	LL
BERYLLIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
CADMIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
CHROMIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
COBALT	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
COPPER	EPA 200.7	0.0038 MG/L		11/20/2009	10:44	LL
IRON	EPA 200.7	0.0076 MG/L		11/20/2009	10:44	LL
LEAD	EPA 200.7	<0.0010 MG/L	M	11/20/2009	10:44	LL
MAGNESIUM	EPA 200.7	3.40 MG/L	J+, N*	11/19/2009	16:00	LL
MANGANESE	EPA 200.7	<0.0050 MG/L		11/20/2009	10:44	LL
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
MERCURY	EPA 245.1	<0.0002 MG/L		11/18/2009	17:31	JRT
NICKEL	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
SELENIUM	EPA 200.7	<0.0020 MG/L	M	11/20/2009	10:44	LL
SILVER	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
TIN	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
TITANIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	10:44	LL
THALLIUM	EPA 200.7	<0.0020 MG/L	M	11/20/2009	10:44	LL
ZINC	EPA 200.7	0.0117 MG/L	J+	11/20/2009	10:44	LL
BORON	EPA 200.7	0.0064 MG/L		11/20/2009	10:44	LL
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	<4.00 MG/L		11/18/2009	13:00	JRT

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Test	Method	Result	Qual	Date	Time	Tech
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003 **FINISHED 11/18/09 0630**

.....continued

HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	53.5 MG/L	J+, N*	11/19/2009	16:00	LL
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004 **FINISHED 11/18/09 0630 DISSOLVED METALS**

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0140 MG/L		11/20/2009	11:16	LL
ANTIMONY	EPA 200.7	<0.0020 MG/L	M	11/20/2009	11:16	LL
ARSENIC	EPA 200.7	0.0275 MG/L	M	11/20/2009	11:16	LL
BARIUM	EPA 200.7	0.0182 MG/L		11/20/2009	11:16	LL
BERYLLIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL
CADMIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL
CHROMIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL
COBALT	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL
COPPER	EPA 200.7	0.0029 MG/L		11/20/2009	11:16	LL
IRON	EPA 200.7	<0.0060 MG/L		11/20/2009	11:16	LL
LEAD	EPA 200.7	<0.0010 MG/L	M	11/20/2009	11:16	LL
MAGNESIUM	EPA 200.7	3.32 MG/L	J-, *	11/19/2009	14:31	LL
MANGANESE	EPA 200.7	<0.0050 MG/L		11/20/2009	11:16	LL
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL
MERCURY	EPA 245.1	<0.0002 MG/L		11/18/2009	17:39	JRT
NICKEL	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL
SELENIUM	EPA 200.7	<0.0020 MG/L	M	11/20/2009	11:16	LL
SILVER	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL
TIN	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL
TITANIUM	EPA 200.7	<0.0010 MG/L		11/20/2009	11:16	LL

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004 **FINISHED 11/18/09 0630 DISSOLVED METALS**

.....continued

THALLIUM	EPA 200.7	<0.0020 MG/L	M	11/20/2009	11:16	LL
ZINC	EPA 200.7	0.0158 MG/L	J+	11/20/2009	11:16	LL
BORON	EPA 200.7	0.0064 MG/L		11/20/2009	11:16	LL
SILICA (SiO2)	EPA 200.7	6.00 MG/L		11/19/2009	14:31	LL

M= THESE SAMPLES ARE REPORTED BY METHOD 200.7 FOR INFORMATIONAL PURPOSES TO PROVIDE QUICKER REPORTING. WHILE THESE REPORTED NUMBERS ARE CONSIDERED ACCURATE, TDEC APPROVED METHODS (EITHER 200.8 OR 200.9) ARE ALSO BEING ANALYZED AS VERIFICATION AND THIS REPORT WILL BE MODIFIED TO REFLECT THE METHOD CHANGE WHEN COMPLETE.

RESPECTFULLY SUBMITTED: _____

MICROBAC LABORATORIES, INC.

Thank you for your business. We invite your feedback on our level of service to you. Please contact the Laboratory Director, James Nokes, at 865-977-1200, the COO, Robert Morgan, at rmorgan@microbac.com or the President, James Nokes, at jnokes@microbac.com with any comments or suggestions.

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As regulatory limits change frequently, Microbac advises the recipient of this report to confirm such limits with the appropriate Federal, state, or local authorities before acting in reliance on the regulatory limits provided.

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QUALIFIER DEFINITIONS:

- B = Detected in the associated Method Blank
- C = As Tons CaCO₃, equivalent per 1,000 tons material
- D = Surrogate recoveries not calculated due to matrix interference and resulting sample dilution
- E1 = Elevated detection limits due to sample matrix interference
- E2 = Elevated detection limits due to high analyte concentration
- H = Analyte was prepared and/or analyzed outside of the analytical method holding time
- I = Spike recovery outside control limits due to sample matrix interference or high analyte concentration
- J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample
- J+ = The result is an estimated quantity, but the result may be biased high
- J- = The result is an estimated quantity, but the result may be biased low
- UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise
- K = Analyte concentration estimated due to sample matrix interference and/or high analyte concentration interference
- L1 = Liquid portion of dual phase sample analyzed only
- L2 = Solid portion of dual phase sample analyzed only
- M = Miscellaneous (see entry below analytical results)
- N = Analyte acceptable but matrix spike/matrix spike duplicate outside accepted recovery criteria
- * = Matrix Spike/Matrix Spike Duplicate RPD is outside acceptable limits
- P = Sample received improperly preserved
- R = Relative Percent Duplicate (RPD) outside accepted recovery limits
- S1 = Spike recovery outside recovery limits
- S2 = Surrogate recovery outside of control limits. The data was accepted based on the valid recovery of remaining surrogate.
- U = Undetected
- V = Elevated reporting limits due to insufficient sample volume
- W = Results reports on dry weight basis
- Z - The parameter is considered a field analysis with an immediate to 15 minute holding time. Laboratory analysis is confirmatory in nature and is performed outside the preferred holding time window.

ABBREVIATIONS:

- TNTC = Too Numerous To Count
- MG/KG = Milligrams per Kilogram (PPM)
- UG/L = Micrograms per Liter (PPB)
- CFU = Colony Forming Unit



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