

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 11/17/2009
 Cust P.O.
 Invoice No.
 Cust # C120
 Sample Date 11/17/2009
 Permit No. 0000360

Work Order Number: 0911-00652

Subject: KINGSTON WTP RAW AND FINISHED WATER SAMPLES

Test	Method	Result	Qual	Date	Time	Tech
001 RAW 11/17/09 0630						
[TAL METALS]				11/17/2009	14:49	LL
ALUMINUM	EPA 200.7	0.402 MG/L		11/19/2009	12:54	LL
ANTIMONY	EPA 200.7	<0.0020 MG/L	M	11/19/2009	12:54	LL
ARSENIC	EPA 200.7	0.0311 MG/L	M	11/19/2009	12:54	LL
BARIUM	EPA 200.7	0.0231 MG/L		11/19/2009	12:54	LL
BERYLLIUM	EPA 200.7	<0.0010 MG/L	J-	11/19/2009	12:54	LL
CADMIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	12:54	LL
CHROMIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	12:54	LL
COBALT	EPA 200.7	<0.0010 MG/L		11/19/2009	12:54	LL
COPPER	EPA 200.7	0.0017 MG/L		11/19/2009	12:54	LL
IRON	EPA 200.7	0.571 MG/L		11/19/2009	12:54	LL
LEAD	EPA 200.7	<0.0010 MG/L	M	11/19/2009	12:54	LL
MAGNESIUM	EPA 200.7	3.43 MG/L		11/19/2009	10:27	LL
MANGANESE	EPA 200.7	0.0574 MG/L		11/19/2009	12:54	LL
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		11/19/2009	12:54	LL
MERCURY	EPA 245.1	<0.0002 MG/L		11/17/2009	14:49	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		11/19/2009	12:54	LL
SELENIUM	EPA 200.7	<0.0020 MG/L	M	11/19/2009	12:54	LL
SILVER	EPA 200.7	<0.0010 MG/L		11/19/2009	12:54	LL
TIN	EPA 200.7	<0.0010 MG/L		11/19/2009	12:54	LL
TITANIUM	EPA 200.7	0.0099 MG/L		11/19/2009	12:54	LL
THALLIUM	EPA 200.7	<0.0020 MG/L	M	11/19/2009	12:54	LL
ZINC	EPA 200.7	0.0590 MG/L		11/19/2009	12:54	LL
BORON	EPA 200.7	0.0067 MG/L		11/19/2009	12:54	LL
SOLIDS, TOTAL SUSPENDED	SM 2540.D.	12.4 MG/L		11/17/2009	13:00	JRT
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340.B.	54.4 MG/L	J+	11/19/2009	10:27	LL

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Test	Method	Result	Qual	Date	Time	Tech
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002 RAW 11/17/09 0630 DISSOLVED METALS

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0143 MG/L		11/19/2009	13:42	LL
ANTIMONY	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:42	LL
ARSENIC	EPA 200.7	0.0254 MG/L	M	11/19/2009	13:42	LL
BARIUM	EPA 200.7	0.0193 MG/L		11/19/2009	13:42	LL
BERYLLIUM	EPA 200.7	<0.0010 MG/L	J-	11/19/2009	13:42	LL
CADMIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:42	LL
CHROMIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:42	LL
COBALT	EPA 200.7	<0.0010 MG/L		11/19/2009	13:42	LL
COPPER	EPA 200.7	0.0012 MG/L		11/19/2009	13:42	LL
IRON	EPA 200.7	0.0341 MG/L		11/19/2009	13:42	LL
LEAD	EPA 200.7	<0.0010 MG/L	M	11/19/2009	13:42	LL
MAGNESIUM	EPA 200.7	3.31 MG/L		11/19/2009	12:21	LL
MANGANESE	EPA 200.7	<0.0050 MG/L		11/19/2009	13:42	LL
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:42	LL
MERCURY	EPA 245.1	<0.0002 MG/L		11/17/2009	15:31	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		11/19/2009	13:42	LL
SELENIUM	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:42	LL
SILVER	EPA 200.7	<0.0010 MG/L		11/19/2009	13:42	LL
TIN	EPA 200.7	<0.0010 MG/L		11/19/2009	13:42	LL
TITANIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:42	LL
THALLIUM	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:42	LL
ZINC	EPA 200.7	0.0335 MG/L		11/19/2009	13:42	LL
BORON	EPA 200.7	0.0062 MG/L		11/19/2009	13:42	LL
SILICA (SiO2)	EPA 200.7	5.46 MG/L		11/19/2009	12:21	LL



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003 FINISHED 11/17/09 0630

Test	Method	Result	Qual	Date	Time	Tech
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0180 MG/L		11/19/2009	13:18	LL
ANTIMONY	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:18	LL
ARSENIC	EPA 200.7	0.0269 MG/L	M	11/19/2009	13:18	LL
BARIUM	EPA 200.7	0.0181 MG/L		11/19/2009	13:18	LL
BERYLLIUM	EPA 200.7	<0.0010 MG/L	J-	11/19/2009	13:18	LL
CADMIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:18	LL
CHROMIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:18	LL
COBALT	EPA 200.7	<0.0010 MG/L		11/19/2009	13:18	LL
COPPER	EPA 200.7	0.0024 MG/L		11/19/2009	13:18	LL
IRON	EPA 200.7	<0.0060 MG/L		11/19/2009	13:18	LL
LEAD	EPA 200.7	<0.0010 MG/L	M	11/19/2009	13:18	LL
MAGNESIUM	EPA 200.7	3.17 MG/L		11/19/2009	11:08	LL
MANGANESE	EPA 200.7	<0.0050 MG/L		11/19/2009	13:18	LL
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:18	LL
MERCURY	EPA 245.1	<0.0002 MG/L		11/17/2009	15:10	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		11/19/2009	13:18	LL
SELENIUM	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:18	LL
SILVER	EPA 200.7	<0.0010 MG/L		11/19/2009	13:18	LL
TIN	EPA 200.7	<0.0010 MG/L		11/19/2009	13:18	LL
TITANIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:18	LL
THALLIUM	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:18	LL
ZINC	EPA 200.7	0.0081 MG/L		11/19/2009	13:18	LL
BORON	EPA 200.7	0.0060 MG/L		11/19/2009	13:18	LL
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	<4.00 MG/L		11/17/2009	13:00	JRT



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Test	Method	Result	Qual	Date	Time	Tech
003 FINISHED 11/17/09 0630						
.....continued						
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	53.3 MG/L	J+	11/19/2009	11:08	LL
004 FINISHED 11/17/09 0630 DISSOLVED METALS						
[TAL METALS]					00:00	
ALUMINUM	EPA 200.7	0.0194 MG/L		11/19/2009	13:51	LL
ANTIMONY	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:51	LL
ARSENIC	EPA 200.7	0.0277 MG/L	M	11/19/2009	13:51	LL
BARIUM	EPA 200.7	0.0181 MG/L		11/19/2009	13:51	LL
BERYLLIUM	EPA 200.7	<0.0010 MG/L	J-	11/19/2009	13:51	LL
CADMIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:51	LL
CHROMIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:51	LL
COBALT	EPA 200.7	<0.0010 MG/L		11/19/2009	13:51	LL
COPPER	EPA 200.7	0.0026 MG/L		11/19/2009	13:51	LL
IRON	EPA 200.7	<0.0060 MG/L		11/19/2009	13:51	LL
LEAD	EPA 200.7	<0.0010 MG/L	M	11/19/2009	13:51	LL
MAGNESIUM	EPA 200.7	3.12 MG/L		11/19/2009	12:29	LL
MANGANESE	EPA 200.7	<0.0050 MG/L		11/19/2009	13:51	LL
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:51	LL
MERCURY	EPA 245.1	<0.0002 MG/L		11/17/2009	15:31	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		11/19/2009	13:51	LL
SELENIUM	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:51	LL
SILVER	EPA 200.7	<0.0010 MG/L		11/19/2009	13:51	LL
TIN	EPA 200.7	<0.0010 MG/L		11/19/2009	13:51	LL
TITANIUM	EPA 200.7	<0.0010 MG/L		11/19/2009	13:51	LL

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Test	Method	Result	Qual	Date	Time	Tech
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004 **FINISHED 11/17/09 0630 DISSOLVED METALS**

.....continued

THALLIUM	EPA 200.7	<0.0020 MG/L	M	11/19/2009	13:51	LL
ZINC	EPA 200.7	0.0075 MG/L		11/19/2009	13:51	LL
BORON	EPA 200.7	0.0061 MG/L		11/19/2009	13:51	LL
SILICA (SiO2)	EPA 200.7	5.99 MG/L		11/19/2009	12:29	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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