



KNOXVILLE DIVISION  
 505 EAST BROADWAY AVE.  
 MARYVILLE, TN 37804  
 (865) 977-1200 FAX (865) 984-8616  
 http://www.microbac.com  
 E-Mail: knoxville@microbac.com

STATE CERT ID.  
 TN 02017

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

**CERTIFICATE OF ANALYSIS**

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

Date Reported 1/14/2010  
 Date Received 12/26/2009  
 Cust P.O.  
 Invoice No. 77416  
 Cust # C120  
 Sample Date 12/26/2009  
 Permit No. 0000360

Work Order Number: 0912-01122

Subject: KINGSTON WTP RAW AND FINISHED WATER SAMPLES

Test	Method	Result	Qual	Date	Time	Tech
<b>001 RAW 12/26/09 0630</b>						
[ TAL METALS ]				01/04/2010	10:50	SRR
ALUMINUM	EPA 200.7	0.339 MG/L	J+	12/29/2009	16:00	SRR
ANTIMONY	EPA 200.8	<0.005 MG/L		01/04/2010	10:50	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		01/04/2010	10:50	MCD
BARIUM	EPA 200.7	0.0231 MG/L		12/29/2009	16:00	SRR
BERYLLIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:00	SRR
CADMIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:00	SRR
CHROMIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:00	SRR
COBALT	EPA 200.7	<0.0010 MG/L		12/29/2009	16:00	SRR
COPPER	EPA 200.7	0.0012 MG/L		12/29/2009	16:00	SRR
IRON	EPA 200.7	0.383 MG/L		12/29/2009	16:00	SRR
LEAD	EPA 200.8	<0.005 MG/L		01/04/2010	10:50	MCD
MAGNESIUM	EPA 200.7	2.95 MG/L	*	12/28/2009	23:28	SRR
MANGANESE	EPA 200.7	0.0356 MG/L		12/29/2009	16:00	SRR
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:00	SRR
MERCURY	EPA 245.1	<0.0002 MG/L		12/29/2009	14:09	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		12/29/2009	16:00	SRR
SELENIUM	EPA 200.8	<0.005 MG/L		01/04/2010	10:50	MCD
SILVER	EPA 200.7	<0.0010 MG/L		12/29/2009	16:00	SRR
TIN	EPA 200.7	<0.0010 MG/L		12/29/2009	16:00	SRR
TITANIUM	EPA 200.7	0.0093 MG/L		12/29/2009	16:00	SRR
THALLIUM	EPA 200.8	<0.001 MG/L		01/04/2010	10:50	MCD
ZINC	EPA 200.7	0.0235 MG/L		12/29/2009	16:00	SRR
BORON	EPA 200.7	0.0084 MG/L		12/29/2009	16:00	SRR
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	7.59 MG/L		12/30/2009	10:30	KDW
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	44.6 MG/L	*,J+	12/28/2009	23:28	SRR

**002 RAW 12/26/09 0630 DISSOLVED METALS**





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002 **RAW 12/26/09 0630 DISSOLVED METALS**

.....continued

[ TAL METALS ]

ALUMINUM	EPA 200.7	0.0348 MG/L		01/04/2010	10:54	SRR
ANTIMONY	EPA 200.8	<0.005 MG/L		12/29/2009	16:14	SRR
ARSENIC	EPA 200.8	<0.005 MG/L		01/04/2010	10:54	MCD
BARIUM	EPA 200.7	0.0203 MG/L		01/04/2010	10:54	MCD
BERYLLIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
CADMIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
CHROMIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
COBALT	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
COPPER	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
IRON	EPA 200.7	0.0470 MG/L		12/29/2009	16:14	SRR
LEAD	EPA 200.8	<0.005 MG/L		12/29/2009	16:14	SRR
MAGNESIUM	EPA 200.7	4.00 MG/L		01/04/2010	10:54	MCD
MANGANESE	EPA 200.7	<0.0050 MG/L		12/28/2009	23:56	SRR
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
MERCURY	EPA 245.1	<0.0002 MG/L		12/29/2009	16:09	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
SELENIUM	EPA 200.8	<0.005 MG/L		12/29/2009	16:14	SRR
SILVER	EPA 200.7	<0.0010 MG/L		01/04/2010	10:54	MCD
TIN	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
TITANIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:14	SRR
THALLIUM	EPA 200.8	<0.001 MG/L		12/29/2009	16:14	SRR
ZINC	EPA 200.7	0.0145 MG/L		01/04/2010	10:54	MCD
BORON	EPA 200.7	0.0087 MG/L	J-	12/29/2009	16:14	SRR
SILICA (SiO2)	EPA 200.7	6.14 MG/L		12/29/2009	16:14	SRR
				12/28/2009	23:56	SRR

003 **FINISHED 12/26/09 0630**



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Test	Method	Result	Qual	Date	Time	Tech
<b>003 FINISHED 12/26/09 0630</b>						
.....continued						
[ TAL METALS ]				01/04/2010	12:13	SRR
ALUMINUM	EPA 200.7	0.0240 MG/L	J+	12/29/2009	16:07	SRR
ANTIMONY	EPA 200.8	<0.005 MG/L		01/04/2010	12:13	MCD
ARSENIC	EPA 200.8	<0.005 MG/L		01/04/2010	12:13	MCD
BARIUM	EPA 200.7	0.0194 MG/L		12/29/2009	16:07	SRR
BERYLLIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
CADMIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
CHROMIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
COBALT	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
COPPER	EPA 200.7	0.0017 MG/L		12/29/2009	16:07	SRR
IRON	EPA 200.7	<0.0060 MG/L		12/29/2009	16:07	SRR
LEAD	EPA 200.8	<0.005 MG/L		01/04/2010	12:13	MCD
MAGNESIUM	EPA 200.7	3.96 MG/L	*	12/28/2009	23:49	SRR
MANGANESE	EPA 200.7	<0.0050 MG/L		12/29/2009	16:07	SRR
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
MERCURY	EPA 245.1	<0.0002 MG/L		12/29/2009	14:13	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
SELENIUM	EPA 200.8	<0.005 MG/L		01/04/2010	12:13	MCD
SILVER	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
TIN	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
TITANIUM	EPA 200.7	<0.0010 MG/L		12/29/2009	16:07	SRR
THALLIUM	EPA 200.8	<0.001 MG/L		01/04/2010	12:13	MCD
ZINC	EPA 200.7	0.0071 MG/L		12/29/2009	16:07	SRR
BORON	EPA 200.7	0.0082 MG/L		12/29/2009	16:07	SRR
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	<4.00 MG/L		12/28/2009	14:00	JRT
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	60.9 MG/L	*,J+	12/28/2009	23:49	SRR

**004 FINISHED 12/26/09 0630 DISSOLVED METALS**





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Table with 7 columns: Test, Method, Result, Qual, Date, Time, Tech. Row 1: 004 FINISHED 12/26/09 0630 DISSOLVED METALS. Rows 2-31: Various metals (ALUMINUM, ANTIMONY, ARSENIC, etc.) with corresponding EPA methods, results, and dates.

REVISED REPORT TO CONTAIN BACK-UP STATE CERTIFIED DATA FOR SB, AS, PB, SE AND TL. ANALYSIS SUBCONTRACTED TO MICROBAC LABORATORIES CHICAGOLAND DIVISION (TN LAB ID#04017). LL 01-13-10.





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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 = Inter-element correction applied due to high concentration of non-target analyte
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

