



KNOXVILLE DIVISION
 505 EAST BROADWAY AVE.
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 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 2/22/2010
 Date Received 2/16/2010
 Cust P.O.
 Invoice No. 78889
 Cust # C120
 Sample Date 2/16/2010
 Permit No. 0000360

Work Order Number: 1002-00583

Subject: KINGSTON WTP RAW AND FINISHED WATER SAMPLES

Test	Method	Result	Qual	Date	Time	Tech
001 RAW 2/16/10 0630						
[TAL METALS]				02/18/2010	14:47	SRR
ALUMINUM	EPA 200.7	0.292 MG/L	J+, *, B	02/18/2010	11:21	SRR
ANTIMONY	EPA 200.8	<0.005 MG/L		02/18/2010	14:47	MTC
ARSENIC	EPA 200.8	<0.005 MG/L		02/18/2010	14:47	MTC
BARIUM	EPA 200.7	0.0214 MG/L	B	02/18/2010	11:21	SRR
BERYLLIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:21	SRR
CADMIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:21	SRR
CHROMIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:21	SRR
COBALT	EPA 200.7	<0.0010 MG/L		02/18/2010	11:21	SRR
COPPER	EPA 200.7	0.0024 MG/L		02/18/2010	11:21	SRR
IRON	EPA 200.7	0.336 MG/L		02/18/2010	11:21	SRR
LEAD	EPA 200.8	<0.005 MG/L		02/18/2010	14:47	MTC
MAGNESIUM	EPA 200.7	4.23 MG/L		02/18/2010	11:21	SRR
MANGANESE	EPA 200.7	0.0271 MG/L		02/18/2010	11:21	SRR
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:21	SRR
MERCURY	EPA 245.1	<0.0002 MG/L		02/17/2010	15:11	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		02/18/2010	11:21	SRR
SELENIUM	EPA 200.8	<0.005 MG/L		02/18/2010	14:47	MTC
SILVER	EPA 200.7	0.0102 MG/L	N, B	02/18/2010	11:21	SRR
TIN	EPA 200.7	<0.0010 MG/L		02/18/2010	11:21	SRR
TITANIUM	EPA 200.7	0.0066 MG/L		02/18/2010	11:21	SRR
THALLIUM	EPA 200.8	<0.001 MG/L		02/18/2010	14:47	MTC
ZINC	EPA 200.7	0.0204 MG/L	B	02/18/2010	11:21	SRR
BORON	EPA 200.7	0.0106 MG/L	N, B	02/18/2010	11:21	SRR
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	4.12 MG/L		02/16/2010	09:00	KDW
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	61.0 MG/L	*	02/18/2010	11:21	SRR

002 RAW 2/16/10 0630 DISSOLVED METALS



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002 **RAW 2/16/10 0630 DISSOLVED METALS**

.....continued

[TAL METALS]

ALUMINUM	EPA 200.7	0.0373 MG/L	J+, *, B	02/18/2010	13:40	SRR
ANTIMONY	EPA 200.8	<0.005 MG/L		02/18/2010	13:40	MTC
ARSENIC	EPA 200.8	<0.005 MG/L		02/18/2010	13:40	MTC
BARIUM	EPA 200.7	0.0194 MG/L		02/18/2010	12:48	SRR
BERYLLIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	12:48	SRR
CADMIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	12:48	SRR
CHROMIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	12:48	SRR
COBALT	EPA 200.7	<0.0010 MG/L		02/18/2010	12:48	SRR
COPPER	EPA 200.7	0.0019 MG/L		02/18/2010	12:48	SRR
IRON	EPA 200.7	0.0331 MG/L		02/18/2010	12:48	SRR
LEAD	EPA 200.8	<0.005 MG/L		02/18/2010	13:40	MTC
MAGNESIUM	EPA 200.7	4.20 MG/L		02/18/2010	12:48	SRR
MANGANESE	EPA 200.7	0.0064 MG/L		02/18/2010	12:48	SRR
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		02/18/2010	12:48	SRR
MERCURY	EPA 245.1	<0.0002 MG/L		02/17/2010	15:44	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		02/18/2010	12:48	SRR
SELENIUM	EPA 200.8	<0.005 MG/L		02/18/2010	13:40	MTC
SILVER	EPA 200.7	0.0019 MG/L	B	02/18/2010	12:48	SRR
TIN	EPA 200.7	<0.0010 MG/L		02/18/2010	12:48	SRR
TITANIUM	EPA 200.7	0.0011 MG/L		02/18/2010	12:48	SRR
THALLIUM	EPA 200.8	<0.001 MG/L		02/18/2010	13:40	MTC
ZINC	EPA 200.7	0.0202 MG/L	B	02/18/2010	12:48	SRR
BORON	EPA 200.7	0.0087 MG/L	B	02/18/2010	12:48	SRR
SILICA (SiO2)	EPA 200.7	5.56 MG/L		02/18/2010	12:48	SRR

003 **FINISHED 2/16/10 0630**



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Test	Method	Result	Qual	Date	Time	Tech
003 FINISHED 2/16/10 0630						
.....continued						
[TAL METALS]				02/18/2010	13:40	SRR
ALUMINUM	EPA 200.7	0.0426 MG/L	J+, *, B	02/18/2010	11:57	SRR
ANTIMONY	EPA 200.8	<0.005 MG/L		02/18/2010	13:40	MTC
ARSENIC	EPA 200.8	<0.005 MG/L		02/18/2010	13:40	MTC
BARIUM	EPA 200.7	0.0188 MG/L	B	02/18/2010	11:57	SRR
BERYLLIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:57	SRR
CADMIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:57	SRR
CHROMIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:57	SRR
COBALT	EPA 200.7	<0.0010 MG/L		02/18/2010	11:57	SRR
COPPER	EPA 200.7	0.0045 MG/L		02/18/2010	11:57	SRR
IRON	EPA 200.7	<0.0060 MG/L		02/18/2010	11:57	SRR
LEAD	EPA 200.8	<0.005 MG/L		02/18/2010	13:40	MTC
MAGNESIUM	EPA 200.7	4.29 MG/L		02/18/2010	11:57	SRR
MANGANESE	EPA 200.7	<0.0050 MG/L		02/18/2010	11:57	SRR
MOLYBDENUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:57	SRR
MERCURY	EPA 245.1	<0.0002 MG/L		02/17/2010	15:40	SRR
NICKEL	EPA 200.7	<0.0010 MG/L		02/18/2010	11:57	SRR
SELENIUM	EPA 200.8	<0.005 MG/L		02/18/2010	13:40	MTC
SILVER	EPA 200.7	0.0050 MG/L	N, B	02/18/2010	11:57	SRR
TIN	EPA 200.7	<0.0010 MG/L		02/18/2010	11:57	SRR
TITANIUM	EPA 200.7	<0.0010 MG/L		02/18/2010	11:57	SRR
THALLIUM	EPA 200.8	<0.001 MG/L		02/18/2010	13:40	MTC
ZINC	EPA 200.7	0.0038 MG/L	B	02/18/2010	11:57	SRR
BORON	EPA 200.7	0.0089 MG/L	N, B	02/18/2010	11:57	SRR
SOLIDS, TOTAL SUSPENDED	SM 2540,D.	<4.00 MG/L		02/16/2010	09:00	KDW
HARDNESS, TOTAL AS CaCO3	EPA 200.7;2340,B.	61.7 MG/L	*	02/18/2010	11:57	SRR

004 FINISHED 2/16/10 0630 DISSOLVED METALS





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Table with 7 columns: Test, Method, Result, Qual, Date, Time, Tech. Row 1: 004 FINISHED 2/16/10 0630 DISSOLVED METALS. Rows 2-30: TAL METALS, ALUMINUM, ANTIMONY, ARSENIC, BARIUM, BERYLLIUM, CADMIUM, CHROMIUM, COBALT, COPPER, IRON, LEAD, MAGNESIUM, MANGANESE, MOLYBDENUM, MERCURY, NICKEL, SELENIUM, SILVER, TIN, TITANIUM, THALLIUM, ZINC, BORON, SILICA (SiO2).

REVISED REPORT TO CONTAIN BACK-UP STATE CERTIFIED DATA FOR SB, AS, PB, SE AND TL. ANALYSIS SUBCONTRACTED TO MICROBAC LABORATORIES TRI-CITIES DIVISION (TN LAB ID#04017). LL 02-19-10.





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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, Ashley Morris, 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

