



Microbac Laboratories, Inc.
 Knoxville Division
 505 E. Broadway Avenue
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 http://www.microbac.com
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CHEMISTRY · MICROBIOLOGY · FOOD SAFETY · CONSUMER PRODUCTS · WATER · AIR · WASTES · FOOD · PHARMACEUTICALS · NUTRACEUTICALS

CERTIFICATE OF ANALYSIS

Chuck Moore
 City of Kingston
 125 W. Cumberland St.
 Kingston, TN 37763

Date Reported: 7/26/2010
 Date Received: 7/17/2010
 Cust #: RC120
 PO#:

Workorder: 1005227 Project: Kingston WTP Raw and Finished Water Samples

Analyte	Result	Units	Qualifier	Reporting Limit	Analyst	Analyzed	Method
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Raw Sampled: 07/17/2010 06:30
 1005227-01 (Water)

Wet Chemistry

Total Suspended Solids	5.0	mg/L		4.0	KDW	07/19/2010 10:25	SM 2540.D.
Metals by EPA 200 Series Methods							
Aluminum	0.122	mg/L	B, N	0.00500	SRR	07/20/2010 13:41	EPA 200.7
Barium	0.0237	mg/L		0.00200	SRR	07/20/2010 13:41	EPA 200.7
Beryllium	ND	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Boron	0.0128	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Cadmium	ND	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Chromium	ND	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Cobalt	ND	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Copper	0.00248	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Hardness, Total as CaCO3	61.7	mg/L		0.0331	SRR	07/20/2010 13:41	EPA 200.7, SM 2340B
Iron	0.107	mg/L	D	0.00600	SRR	07/20/2010 13:41	EPA 200.7
Magnesium	4.42	mg/L		0.00500	SRR	07/20/2010 13:41	EPA 200.7
Manganese	0.0317	mg/L		0.00500	SRR	07/20/2010 13:41	EPA 200.7
Mercury	ND	mg/L		0.000200	SRR	07/19/2010 12:02	EPA 245.1
Molybdenum	ND	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Nickel	ND	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Silver	ND	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Tin	ND	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Titanium	0.00238	mg/L		0.00100	SRR	07/20/2010 13:41	EPA 200.7
Zinc	0.0148	mg/L	B	0.00200	SRR	07/20/2010 13:41	EPA 200.7
Subcontracted Analyses							
Antimony	ND	mg/L		0.00100	UL	07/21/2010 13:46	EPA 200.8
Arsenic	ND	mg/L		0.00200	UL	07/21/2010 13:46	EPA 200.8
Lead	ND	mg/L		0.00100	UL	07/21/2010 13:46	EPA 200.8
Selenium	ND	mg/L		0.00200	UL	07/21/2010 13:46	EPA 200.8
Thallium	ND	mg/L		0.000400	UL	07/21/2010 13:46	EPA 200.8

Raw Dissolved Sampled: 07/17/2010 06:30
 1005227-02 (Water)

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Workorder: 1005227 Project: Kingston WTP Raw and Finished Water Samples

Analyte	Result	Units	Qualifier	Reporting Limit	Analyst	Analyzed	Method
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Raw Dissolved Sampled: 07/17/2010 06:30
 1005227-02 (Water)

Metals (Dissolved) by EPA 200 Series Methods

Aluminum	0.0658	mg/L	B	0.00500	SRR	07/20/2010 12:52	EPA 200.7
Barium	0.0223	mg/L		0.00200	SRR	07/20/2010 12:52	EPA 200.7
Beryllium	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Boron	0.0227	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Cadmium	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Chromium	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Cobalt	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Copper	0.00325	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Iron	0.00624	mg/L		0.00600	SRR	07/20/2010 12:52	EPA 200.7
Magnesium	4.19	mg/L		0.00500	SRR	07/20/2010 12:52	EPA 200.7
Manganese	ND	mg/L		0.00500	SRR	07/20/2010 12:52	EPA 200.7
Mercury	ND	mg/L		0.000200	SRR	07/19/2010 12:56	EPA 245.1
Molybdenum	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Nickel	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
SILICA (SiO2)	4.62	mg/L		0.0107	SRR	07/20/2010 12:52	EPA 200.7
Silver	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Tin	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Titanium	ND	mg/L		0.00100	SRR	07/20/2010 12:52	EPA 200.7
Zinc	0.0310	mg/L	B	0.00200	SRR	07/20/2010 12:52	EPA 200.7

Subcontracted Analyses

Antimony	ND	mg/L		0.00100	UL	07/20/2010 19:45	EPA 200.8
Arsenic	ND	mg/L		0.00200	UL	07/20/2010 19:45	EPA 200.8
Lead	0.00300	mg/L		0.00100	UL	07/20/2010 19:45	EPA 200.8
Selenium	ND	mg/L		0.00200	UL	07/20/2010 19:45	EPA 200.8
Thallium	ND	mg/L		0.000400	UL	07/20/2010 19:45	EPA 200.8

Finished Sampled: 07/17/2010 06:30
 1005227-03 (Water)

Wet Chemistry

Total Suspended Solids	ND	mg/L		4.0	KDW	07/19/2010 10:25	SM 2540.D.
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Finished Sampled: 07/17/2010 06:30
 1005227-03 (Water)

Metals by EPA 200 Series Methods

Aluminum	0.0614	mg/L	B, N	0.00500	SRR	07/20/2010 13:02	EPA 200.7
Barium	0.0226	mg/L		0.00200	SRR	07/20/2010 13:02	EPA 200.7
Beryllium	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Boron	0.0113	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Cadmium	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Chromium	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Cobalt	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Copper	0.00208	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Hardness, Total as CaCO3	56.9	mg/L		0.0331	SRR	07/20/2010 13:02	EPA 200.7, SM 2340B
Iron	0.00783	mg/L	D	0.00600	SRR	07/20/2010 13:02	EPA 200.7
Magnesium	4.02	mg/L		0.00500	SRR	07/20/2010 13:02	EPA 200.7
Manganese	ND	mg/L		0.00500	SRR	07/20/2010 13:02	EPA 200.7
Mercury	ND	mg/L		0.000200	SRR	07/19/2010 12:06	EPA 245.1
Molybdenum	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Nickel	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Silver	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Tin	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Titanium	ND	mg/L		0.00100	SRR	07/20/2010 13:02	EPA 200.7
Zinc	0.0115	mg/L	B	0.00200	SRR	07/20/2010 13:02	EPA 200.7

Subcontracted Analyses

Antimony	ND	mg/L		0.00100	UL	07/20/2010 19:51	EPA 200.8
Arsenic	ND	mg/L		0.00200	UL	07/20/2010 19:51	EPA 200.8
Lead	ND	mg/L		0.00100	UL	07/20/2010 19:51	EPA 200.8
Selenium	ND	mg/L		0.00200	UL	07/20/2010 19:51	EPA 200.8
Thallium	ND	mg/L		0.000400	UL	07/20/2010 19:51	EPA 200.8

Finished Dissolved Sampled: 07/17/2010 06:30
 1005227-04 (Water)

Metals (Dissolved) by EPA 200 Series Methods

Aluminum	0.0856	mg/L	B	0.00500	SRR	07/20/2010 12:57	EPA 200.7
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Finished Dissolved Sampled: 07/17/2010 06:30
 1005227-04 (Water)

Metals (Dissolved) by EPA 200 Series Methods

Barium	0.0218	mg/L		0.00200	SRR	07/20/2010 12:57	EPA 200.7
Beryllium	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Boron	0.0221	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Cadmium	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Chromium	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Cobalt	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Copper	0.00259	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Iron	ND	mg/L		0.00600	SRR	07/20/2010 12:57	EPA 200.7
Magnesium	3.86	mg/L		0.00500	SRR	07/20/2010 12:57	EPA 200.7
Manganese	ND	mg/L		0.00500	SRR	07/20/2010 12:57	EPA 200.7
Mercury	ND	mg/L		0.000200	SRR	07/19/2010 13:00	EPA 245.1
Molybdenum	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Nickel	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
SILICA (SiO2)	5.23	mg/L		0.0107	SRR	07/20/2010 12:57	EPA 200.7
Silver	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Tin	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Titanium	ND	mg/L		0.00100	SRR	07/20/2010 12:57	EPA 200.7
Zinc	0.00521	mg/L	B	0.00200	SRR	07/20/2010 12:57	EPA 200.7

Subcontracted Analyses

Antimony	ND	mg/L		0.00100	UL	07/20/2010 19:57	EPA 200.8
Arsenic	ND	mg/L		0.00200	UL	07/20/2010 19:57	EPA 200.8
Lead	0.00320	mg/L		0.00100	UL	07/20/2010 19:57	EPA 200.8
Selenium	ND	mg/L		0.00200	UL	07/20/2010 19:57	EPA 200.8
Thallium	ND	mg/L		0.000400	UL	07/20/2010 19:57	EPA 200.8

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Certifications

Code	Description	Number	Expires
IN_DW	Indiana State Department of Health	C-TN-03	04/30/2011
PA	Commonwealth of Pennsylvania	68-00725 (003)	03/31/2011
TN_DW	State of Tennessee	TN02017	04/30/2011
USDA	US Department of Agriculture		11/30/2010

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Analyte	Result	Units	Qualifier	Reporting Limit	Analyst	Analyzed	Method
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Notes and Definitions

- N Analyte acceptable but matrix spike/matrix spike duplicate outside accepted recovery criteria
- 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
- D Surrogate recoveries not calculated due to matrix interference and resulting sample dilution
- B Detected in the associated Method Blank
- * Relative Percent Duplicate (RPD) outside accepted recovery limits.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

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Microbac Knoxville

JOE SLOAN For BROCK STONER, PROJECT MANAGER

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.

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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Cooler Inspection Form

Client Name: City of Kingston

Date/Time Received: 7/17/16 8:10

Work Order: 100 5227-

No. of Samples: 2

Received By: Kristie Borenport

Checklist Completed By: JAT

Carrier: FedEx() UPS() Client Field Services() Other(): _____

- | | | | |
|---|---|-----------------------------|---|
| After-Hours Receipt? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Shipping container in good condition? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/> |
| Custody seals intact on cooler? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| Custody seals intact on samples? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| Chain of custody present? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody includes proper client information? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody includes proper collection information and signatures? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody includes dates and times of sample collection? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody includes proper sample descriptions? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody agrees with sample labels? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody identifies proper sample matrix? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody identifies proper number of samples? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody includes required analysis? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody signed when relinquished and received? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Samples are in proper containers/bottles? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Sample containers are intact? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Sufficient sample volume collected for requested analysis? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| VOA vials for aqueous samples have zero headspace? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Samples received within holding times? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| Samples received on ice? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Sample properly preserved? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |

If No, adjusted by? _____ Date/Time: _____

Remarks: _____

ANY "NO" EVALUATION REQUIRES CLIENT NOTIFICATION (excluding After-Hours Receipt).

Comments: _____