



Microbac Laboratories, Inc.
 Knoxville Division
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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: 7/18/2010
 Cust #: RC120
 PO#:

Workorder: 1005228 Project: Kingston WTP Raw and Finished Water Samples

Analyte	Result	Units	Qualifier	Reporting Limit	Analyst	Analyzed	Method
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Raw Sampled: 07/18/2010 06:30
 1005228-01 (Water)

Wet Chemistry

Total Suspended Solids	ND	mg/L		4.0	KDW	07/19/2010 10:25	SM 2540.D.
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Metals by EPA 200 Series Methods

Aluminum	0.144	mg/L	N	0.00500	SRR	07/19/2010 15:31	EPA 200.7
Barium	0.0222	mg/L		0.00200	SRR	07/19/2010 15:31	EPA 200.7
Beryllium	ND	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Boron	0.0120	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Cadmium	ND	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Chromium	0.00121	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Cobalt	ND	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Copper	0.00237	mg/L	J+	0.00100	SRR	07/19/2010 15:31	EPA 200.7
Hardness, Total as CaCO3	60.5	mg/L		0.0331	SRR	07/19/2010 15:31	EPA 200.7, SM 2340B
Iron	0.118	mg/L	D	0.00600	SRR	07/19/2010 15:31	EPA 200.7
Magnesium	4.22	mg/L		0.00500	SRR	07/19/2010 15:31	EPA 200.7
Manganese	0.0297	mg/L		0.00500	SRR	07/19/2010 15:31	EPA 200.7
Mercury	ND	mg/L		0.000200	SRR	07/19/2010 12:10	EPA 245.1
Molybdenum	ND	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Nickel	ND	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Silver	ND	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Tin	ND	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Titanium	0.00298	mg/L		0.00100	SRR	07/19/2010 15:31	EPA 200.7
Zinc	0.0164	mg/L	B	0.00200	SRR	07/19/2010 15:31	EPA 200.7

Subcontracted Analyses

Antimony	ND	mg/L		0.00100	UL	07/21/2010 13:52	EPA 200.8
Arsenic	ND	mg/L		0.00200	UL	07/21/2010 13:52	EPA 200.8
Lead	ND	mg/L		0.00100	UL	07/21/2010 13:52	EPA 200.8
Selenium	ND	mg/L		0.00200	UL	07/21/2010 13:52	EPA 200.8
Thallium	ND	mg/L		0.000400	UL	07/21/2010 13:52	EPA 200.8

Raw Dissolved Sampled: 07/18/2010 06:30
 1005228-02 (Water)

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Analyte	Result	Units	Qualifier	Reporting Limit	Analyst	Analyzed	Method
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Raw Dissolved Sampled: 07/18/2010 06:30
 1005228-02 (Water)

Metals (Dissolved) by EPA 200 Series Methods

Aluminum	ND	mg/L		0.00500	SRR	07/19/2010 17:08	EPA 200.7
Barium	0.0215	mg/L		0.00200	SRR	07/19/2010 17:08	EPA 200.7
Beryllium	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Boron	0.0106	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Cadmium	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Chromium	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Cobalt	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Copper	0.00174	mg/L	J+	0.00100	SRR	07/19/2010 17:08	EPA 200.7
Iron	ND	mg/L		0.00600	SRR	07/19/2010 17:08	EPA 200.7
Magnesium	4.05	mg/L		0.00500	SRR	07/19/2010 17:08	EPA 200.7
Manganese	ND	mg/L		0.00500	SRR	07/19/2010 17:08	EPA 200.7
Mercury	ND	mg/L		0.000200	SRR	07/19/2010 13:05	EPA 245.1
Molybdenum	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Nickel	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
SILICA (SiO2)	4.33	mg/L		0.0107	SRR	07/19/2010 17:08	EPA 200.7
Silver	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Tin	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Titanium	ND	mg/L		0.00100	SRR	07/19/2010 17:08	EPA 200.7
Zinc	0.00744	mg/L	B	0.00200	SRR	07/19/2010 17:08	EPA 200.7

Subcontracted Analyses

Antimony	ND	mg/L		0.00100	UL	07/20/2010 20:02	EPA 200.8
Arsenic	ND	mg/L		0.00200	UL	07/20/2010 20:02	EPA 200.8
Lead	ND	mg/L		0.00100	UL	07/20/2010 20:02	EPA 200.8
Selenium	ND	mg/L		0.00200	UL	07/20/2010 20:02	EPA 200.8
Thallium	ND	mg/L		0.000400	UL	07/20/2010 20:02	EPA 200.8

Finished Sampled: 07/18/2010 06:30
 1005228-03 (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: 07/18/2010 06:30
 1005228-03 (Water)

Metals by EPA 200 Series Methods

Aluminum	0.0941	mg/L	N	0.00500	SRR	07/19/2010 16:13	EPA 200.7
Barium	0.0231	mg/L		0.00200	SRR	07/19/2010 16:13	EPA 200.7
Beryllium	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Boron	0.0132	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Cadmium	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Calcium	18.4	mg/L	B, J+	0.00500	SRR	07/19/2010 16:13	EPA 200.7
Chromium	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Cobalt	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Copper	0.00189	mg/L	J+	0.00100	SRR	07/19/2010 16:13	EPA 200.7
Hardness, Total as CaCO3	64.8	mg/L		0.0331	SRR	07/19/2010 16:13	EPA 200.7, SM 2340B
Iron	ND	mg/L		0.00600	SRR	07/19/2010 16:13	EPA 200.7
Magnesium	4.60	mg/L		0.00500	SRR	07/19/2010 16:13	EPA 200.7
Manganese	ND	mg/L		0.00500	SRR	07/19/2010 16:13	EPA 200.7
Mercury	ND	mg/L		0.000200	SRR	07/19/2010 12:14	EPA 245.1
Molybdenum	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Nickel	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Silver	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Tin	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Titanium	ND	mg/L		0.00100	SRR	07/19/2010 16:13	EPA 200.7
Zinc	0.00510	mg/L	B	0.00200	SRR	07/19/2010 16:13	EPA 200.7

Subcontracted Analyses

Antimony	ND	mg/L		0.00100	UL	07/20/2010 20:38	EPA 200.8
Arsenic	ND	mg/L		0.00200	UL	07/20/2010 20:38	EPA 200.8
Lead	ND	mg/L		0.00100	UL	07/20/2010 20:38	EPA 200.8
Selenium	ND	mg/L		0.00200	UL	07/20/2010 20:38	EPA 200.8
Thallium	ND	mg/L		0.000400	UL	07/20/2010 20:38	EPA 200.8

Finished Dissolved Sampled: 07/18/2010 06:30
 1005228-04 (Water)

Metals (Dissolved) by EPA 200 Series Methods

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Finished Dissolved Sampled: 07/18/2010 06:30
 1005228-04 (Water)

Metals (Dissolved) by EPA 200 Series Methods

Aluminum	0.0969	mg/L	B	0.00500	SRR	07/20/2010 12:36	EPA 200.7
Barium	0.0230	mg/L		0.00200	SRR	07/20/2010 12:36	EPA 200.7
Beryllium	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Boron	0.0121	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Cadmium	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Chromium	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Cobalt	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Copper	0.00213	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Iron	ND	mg/L		0.00600	SRR	07/20/2010 12:36	EPA 200.7
Magnesium	4.30	mg/L		0.00500	SRR	07/20/2010 12:36	EPA 200.7
Manganese	ND	mg/L		0.00500	SRR	07/20/2010 12:36	EPA 200.7
Mercury	ND	mg/L		0.000200	SRR	07/19/2010 13:09	EPA 245.1
Molybdenum	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Nickel	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
SILICA (SiO2)	4.78	mg/L		0.0107	SRR	07/20/2010 12:36	EPA 200.7
Silver	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Tin	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Titanium	ND	mg/L		0.00100	SRR	07/20/2010 12:36	EPA 200.7
Zinc	0.00482	mg/L	B	0.00200	SRR	07/20/2010 12:36	EPA 200.7

Subcontracted Analyses

Antimony	ND	mg/L		0.00100	UL	07/20/2010 20:43	EPA 200.8
Arsenic	ND	mg/L		0.00200	UL	07/20/2010 20:43	EPA 200.8
Lead	ND	mg/L		0.00100	UL	07/20/2010 20:43	EPA 200.8
Selenium	ND	mg/L		0.00200	UL	07/20/2010 20:43	EPA 200.8
Thallium	ND	mg/L		0.000400	UL	07/20/2010 20:43	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: 7/19/16 @ 1:00

Work Order: 1005278

No. of Samples: 2

Received By: [Signature]

Checklist Completed By: [Signature]

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

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

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

Remarks: _____

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

Comments: _____